SEP 26 1973
MICHAEL RODAK, JR., CLERK

APPENDIX

Volume I—Pages 1-464

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

	Page
Relevant Docket Entries	1
Complaint by the United States filed September 22, 1967	10
Excerpts from Deposition of Frank Nugent, taken September 10-11, 1968	18
Excerpts from Deposition of Nicholas T. Camicia, taken September 17, 1968	74
Excerpts from Deposition of John M. Morris, taken September 25 & October 1, 1968	99
Excerpts from Deposition of Frank Frederick Kolbe, taken October 10, 11, 15, 17, 18, 22, 24, 28, 29, 30, & 31, 1968	126
Excerpts from Deposition of Robert H. Inman, taken November 4, 1968	184
Excerpts from Deposition of Joseph C. Tabor, taken November 8, 1968	214
Excerpts from Deposition of Thomas J. Tarzy, taken November 14-15, 1968	215

INDEX

	Page
Excerpts from Deposition of Burl Charles Jensen, taken November 21, 1968	291
Excerpts from Deposition of Thomas H. Latimer, taken December 3, 4, & 5, 1968	296
Excerpts from Deposition of Joseph J. Gallagher, taken December 12, 1968	320
Excerpt from Deposition of William L. Kurtz, taken December 12, 1968	323
Excerpts from Deposition of Martha Terleke, taken December 16, 1968	326
Excerpts from Deposition of Charles W. Stadell, taken December 16, 1968	332
Excerpts from Deposition of Harold K. Pedersen, taken December 18, 1968	339
Excerpt from Deposition of John P. Maguire, taken December 23, 1968	347
Excerpts from Deposition of B. H. Sloane, taken March 7, 1969	348
Excerpts from Deposition of Hugh E. Petersen, taken March 13, 1969	365
Excerpts from Deposition of John T. Middleton, taken March 13, 1969	380
Excerpts from Deposition of P. W. Dorrane, taken March 20, 1969	390
Excerpts from Deposition of Leon King, taken March 25, 1969	402
Excerpts from Deposition of Josephine C. Burton, taken April 14, 1969	413
Excerpts from Deposition of John P. Nix, taken April 14, 1969	417
Excerpts from Deposition of Aldo P. Brazzale, taken April 14, 1969	425
Excerpts from Deposition of Clarence V. Beck, taken April 16, 1969	429

INDEX

	Page
Excerpts from Deposition of Winford C. Peterson, taken April 18, 1969	446
Excerpts from Deposition of Harold S. Walker, Jr., taken April 18, 1969	465
Excerpts from Deposition of William J. Stanley, taken April 24, 1969	486
Excerpts from Deposition of Fred E. Nicosin, taken May 15, 1969	498
Excerpt from Deposition of William D. Stiehl, taken May 20, 1969	536
Excerpts from Deposition of Thomas N. Ward, taken May 28, 1969	546
Excerpts from Deposition of Reuben A. Redard, taken June 10, 1969	568
Excerpts from Deposition of Harry B. Gaunt, taken June 13, 1969	576
Excerpts from Deposition of Gordon J. Morrison, taken June 20, 1969	596
Excerpts from Deposition of John Samuel Moore, taken June 20, 1969	614
Excerpts from Deposition of Bernard W. Schotters, taken June 23, 1969	636
Excerpts from Deposition of Leroy M. Abrahamson, taken June 26, 1969	650
Excerpts from Deposition of George P. Gamble, taken June 27, 1969	675
Excerpts from Deposition of Jack A. Simon, taken July 31, 1969	678
Excerpts from Deposition of John E. Organ, taken August 1, 1969	683
Excerpts from Deposition of John Paul Weir, taken August 5, 1969	692
Excerpts from Deposition of S. Smith Griswold, taken August 19, 1969	706

INDEX

Page

Excerpts from Deposition of Bruce C. Netschert, taken August 20, 1969 731

Excerpts from Deposition of Abraham Gerber, taken August 21, 1969 764

Excerpts from Deposition of Peter O. Steiner, taken October 7-8, 1969 781

The Stipulated Testimony of C. C. Smith, dated December 4, 1968 832

The Stipulated Testimony of J. R. Sinclair, dated July 9, 1969, and attached exhibits 1-4 838

The Stipulated Testimony of George H. Shipley, dated July 10, 1969 848

The Stipulated Testimony of George B. Knecht, dated September 3, 1969, and attached exhibits 1-10 851

The Stipulated Testimony of David G. Hemminger, dated September 17, 1969 869

The Stipulated Testimony of John Sant, dated September 17, 1969 870

Excerpts from Transcript of Proceedings before Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, on October 3, 1969 872

Motion of Frank F. Kolbe to be excused from testifying at trial, and attached letter dated March 4, 1970 875

Defendants' Proposed Findings of Fact and Conclusions of Law filed October 27, 1970 880

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, commencing March 30, 1970:

Appearances 1017

Testimony of Jack A. Simon

—cross 1018

—redirect 1037

—direct 1038

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on March 31, 1970:

Appearances 1044

Testimony of John M. Morris

—direct 1046

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 1, 1970:

Appearances 1092

Testimony of John M. Morris (resumed)

—cross 1093

Testimony of Louis R. Tomey

—direct 1105

—cross 1116

—redirect 1128

—recross 1132

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 2, 1970:

Appearances 1134

Testimony of John M. Morris (resumed)

—cross 1135

—recross 1164

Testimony of Reuben Thorson

—direct 1164

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 3, 1970 :

Appearances 1172

Testimony of Victor H. Wood

—direct 1173

—cross 1179

—redirect 1188

—recross 1192

Testimony of A. H. Davis

—direct 1196

—cross 1206

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 6, 1970:	
Appearances	1219
Testimony of A. H. Davis (resumed)	
—cross	1219
—redirect	1227
—recross	1229
Testimony of Ernest B. Tremmel	
—direct	1229
—cross	1250
Testimony of Reuben Thorson	
—cross	1255
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 7, 1970:	
Appearances	1262
Testimony of Robert W. Steele	
—direct	1263
—cross	1269
—redirect	1279
Testimony of Thomas H. Latimer	
—direct	1282
—cross	1284
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 8, 1970:	
Appearances	1289
Testimony of E. C. Hill	
—direct	1290
—cross	1305
Testimony of Richard Drollinger	
—direct	1314

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 9, 1970:	
Appearances	1328
Testimony of George Gamble	
—direct	1329
—cross	1349
—recross	1350
Testimony of Thomas Latimer (resumed)	
—cross	1351
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 13, 1970:	
Appearances	1354
Testimony of Nicholas T. Camicia	
—direct	1355
—cross	1362
—redirect	1370
Testimony of Samuel F. Sherwood	
—direct	1372
—cross	1377
—redirect	1384
Testimony of Norman W. Moser	
—direct	1385
—cross	1391
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 14, 1970:	
Appearances	1398
Testimony of Norman W. Moser (resumed)	
—cross	1399
—redirect	1402
Testimony of Gordon R. Corey	
—direct	1404
—cross	1421
—redirect	1443
—recross	1444
—redirect	1446

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robinson on April 14, 1970:—Continued	
Testimony of John D. Ames	
—direct	1447
—cross	1452
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 15, 1970:	
Appearances	1456
Testimony of Daric N. Miller	
—direct	1457
—cross	1463
Testimony of Frank Nugent	
—direct	1468
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 16, 1970:	
Appearances	1487
Testimony of Hollie Hopper	
—direct	1488
—cross	1494
—redirect	1509
—recross	1514
Testimony of Frank Nugent (resumed)	
—direct	1515
—cross	1529
—redirect	1538
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 17, 1970:	
Appearances	1540
Testimony of Thomas L. Craig	
—direct	1541
—cross	1553
—redirect	1557
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:	
Appearances	1561

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:—Continued

Testimony of Peter O. Steiner *

—direct 1562

Testimony of Robert H. Quig

—direct 1593
—cross 1598
—redirect 1599

Testimony of Peter O. Steiner (resumed)

—direct 1601

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 21, 1970:

Appearances 1630

Testimony of Peter O. Steiner (resumed)

—cross 1631
—redirect 1672
—recross 1677

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 22, 1970:

Appearances 1678

Testimony of James M. Folson

—direct 1681
—cross 1695
—redirect 1711

*Decision on the Merits entered by the District Court on April 13, 1972 ..... J.S. 1a

Notice of Appeal to the Supreme Court by the United States dated June 7, 1972 1717

Order of the Supreme Court noting probable jurisdiction, dated December 11, 1972 1718

* Not reprinted in Joint Appendix. Citation is to appendix of Jurisdictional Statement.

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS

Civil Action No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION,
THE UNITED ELECTRIC COAL COMPANIES AND
FREEMAN COAL MINING CORPORATION, DEFENDANTS

RELEVANT DOCKET ENTRIES

Date	
1967	
September 22	Filed Complaint and 3 copies
October 17	On stipulation order time for defendants to answer, move or otherwise reply to complaint hereby extended to and including Nov. 20, 1967. DRAFT-Robson, J.
1968	
March 21	Filed letter re interrogatory No. 54 from attorney for plaintiff.
July 16	Enter Pretrial Order No. 1 (DRAFT). Enter Protective Order with respect to defendants documents (DRAFT). Enter Order with respect to defendants Claim of Attorney-Client Privilege (DRAFT). ROBSON, J.
September 9	Filed Stipulation and Protective Order covering disclosure to defense counsel of information received by Plaintiff from Coal Companies and Coal Purchasers

Date	
1968	
September 9	Enter Order approving stipulation and entering protective order covering disclosure to defense counsel of information received by plaintiff from coal companies and coal purchasers (DRAFT) (Above Stipulation and Minute order combined as one Draft) ROBSON, J.
1969	
March 11	Enter agreed orders directing clerk to issue subpoenas duces tecum in the form attached for service in any judicial district upon respondents listed in Exhibit A, by registered mail, return receipt requested, with questionnaires attached. Order documents, etc., and any responses to questionnaire to not be shown to persons designated in orders except by order of Court (2 DRAFTS) ROBSON, J.
September 11	Filed deposition of Clarence V. Beck.
September 18	Filed Stipulated testimony by Daniel G. Hemminger, Attorney for The Proctor and Gamble Company, Cincinnati, Ohio.
September 18	Filed Stipulated testimony by John Sant, Attorney, McDonnell Douglas Corporation, St. Louis, Missouri.
October 1	Filed stipulated testimony of George B. Knecht with exhibits 1 through 10 attached.
October 3	Pre trial conference held. Order proposed findings of fact, etc., to be submitted by November 17 and cause set for further pre-trial conference on December 5, 1969 at 2 p.m.— Robson, J.

Date	
1970	
March 23	Filed Plaintiff's pre-trial brief.
March 30	Cause called for trial. Opening statements made. Evidence heard for government. Government rests. Order any motions to be made by defendant to be entered and considered with case itself. Evidence heard in part for defendant. Order cause adjourned until March 31, 1970—Robson, J.
March 31	Further evidence heard for defendant. Order cause adjourned until April 1, 1970—Robson, J.
April 1	Filed defendant's motion to dismiss at the close of plaintiff's case
April 1	Further evidence heard for defendant—order cause adjourned until April 2, 1970—Robson, J.
April 2	Further evidence heard for defendant. Order cause adjourned until April 3, 1970 at 9 a.m. —Robson, J.
April 3	Further evidence heard for defendant—order cause adjourned until April 6, 1970—Robson, J.
April 6	Further evidence heard for defendant. Order cause adjourned until April 7, 1970—Robson, J.
April 7	Further evidence heard for defendant—Order cause adjourned until April 8, 1970—Robson, J.
April 8	Further evidence heard for defendant order cause adjourned until April 9, 1970—Robson, J.

Date	
1970	
April 9	Further evidence heard for defendant—Order cause adjourned until April 13, 1970 Robson, J.
April 13	Further evidence heard for defendant. Order cause adjourned until April 14, 1970—Robson, J.
April 14	Further evidence heard for defendants. Order cause adjourned until April 15, 1970—Robson, J.
April 14	Filed Defendants' response to plaintiff's memorandum request that it be allowed to call rebuttal witnesses for purposes other than those originally represented to the Court and to the defendants.
April 14	Filed Plaintiff's reply to defendant's objection to the expended scope of questions possibly to be asked of two of plaintiff's rebuttal witnesses.
April 15	Court rules orally from bench—Order plaintiff's motion to expand rebuttal testimony hereby granted—Further evidence heard for defendant—order cause adjourned until April 16, 1970—Robson, J.
April 16	Further evidence heard for defendant. Order cause adjourned until April 17, 1970—Robson, J.
April 17	Rebuttal evidence heard in part for government. Order cause adjourned until April 20, 1970—Robson, J.
April 20	Evidence heard in part for defendants. Evidence heard in part in rebuttal for government—Order cause adjourned until April 21, 1970—Robson, J.

Date	
1970	
April 21	Evidence heard for defendant. Order cause adjourned until April 22, 1970—Robson, J.
April 22	Further evidence heard for defendant. Defendant rests. Further rebuttal evidence heard for government. Order cause adjourned until May 1, 1970 at 11 a.m. to rest formally and to set briefing schedule on the merits—Robson, J.
May 12	Filed Subpoena ad testificandum returned served on Glen W. Beeman—$2.
May 12	Filed Subpoena ad testificandum returned served on M. A. Shumate. $2.
May 12	Filed Defendants' motion to strike certain Government exhibits.
May 20	Filed Notice
May 20	Filed Government's memorandum in opposition to defendants' memorandum in support of its motion to strike certain Government Exhibits
June 8	Filed Defendants' reply memorandum to the Government's memorandum in opposition to defendants' motion to strike certain Government Exhibits.
June 15	Filed Notice
June 15	Filed Response to Defendants' Reply to Government's memorandum regarding objections to Government Exhibits
August 3	Filed Government's post trial brief, (findings of fact and conclusions of law).
August 28	Filed Corrections to Government's post trial brief, findings of fact and conclusions of law filed August 3, 1970.

Date	
1970	
October 27	Filed defendant's reply to plaintiff's proposed findings of fact and conclusion of law.
October 27	Filed Defendant's Post-Trial Brief.
November 5	Filed correction to defendant's reply to plaintiff's proposed findings of fact and conclusion of law.
1971	
January 11	Filed Government's response to Defendants proposed findings of fact and conclusions of law.
January 14	Filed Plaintiff's Post Trial Reply Brief.
March 8	Enter agreed order permitting sale of one-half interest in Midwest Towing Company, Inc., with proceeds of sale to be placed in escrow—Robson, J. (DRAFT)
1972	
April 13	It is ordered that judgment be and it is hereby rendered for the defendants. It is further ordered that the complaint be and it is hereby dismissed. It is further ordered that costs be assessed against the plaintiff. (Draft) Robson, J.
June 7	Filed notice of appeal to the Supreme Court of the U.S. by the United States of America.
October 27	It is hereby ordered that all funds presently deposited under the terms of Escrow Agreement dated March 11, 1972 between United Electric Coal Companies and the First National Bank of Chicago are to be released to the United Electric Coal Companies upon presentation of a certified copy of this Order

Date	
1972	
October 27	and the escrow dissolved. Within 30 days of completion of the purchases referred to in the Order, the United Electric Coal Companies shall file with the Court, and plaintiff, a copy of all receipts for payment for such purchases. (DRAFT) ROBSON, C.J.
December 18	Filed certified copy of order from Supreme Court of the United States: The statement of jurisdiction in this case having been submitted and considered by the Court, probable jurisdiction is noted.
December 22	Filed letter dated December 19, 1972 from Supreme Court of the United States, re transmitting of Record under Rule 16(6)
1973	
February 5	Filed depositions of Frank Frederick Kolbe in 12 volumes.
February 5	Filed deposition of Harold S. Walker, Jr.
February 5	Filed deposition of P. W. Dorrance
February 5	Filed deposition of George P. Gamble
February 5	Filed deposition of Bernard W. Schotters.
February 5	Filed deposition of Leroy M. Abramson.
February 5	Filed deposition of Abraham Gerber.
February 5	Filed deposition of John Paul Weir.
February 5	Filed deposition of Leon King.
February 5	Filed deposition of Jack A. Simon.
February 5	Filed deposition of John P. Nix.
February 5	Filed deposition of Aldo P. Brazzale.
February 5	Filed deposition of Josephine C. Burton.

Date	
1973	
February 5	Filed deposition of William J. Stanley.
February 5	Filed deposition of William D. Stiehl.
February 5	Filed deposition of Thomas N. Ward.
February 5	Filed deposition of John Samuel Moore.
February 5	Filed deposition of Joseph J. Gallagher.
February 5	Filed deposition of William L. Kurtz.
February 5	Filed deposition of Reuben A. Redard.
February 5	Filed deposition of Harry B. Gaunt.
February 5	Filed deposition of Winford C. Peterson.
February 5	Filed deposition of John E. Organ.
February 5	Filed deposition of Gordon J. Morrison.
February 5	Filed deposition of S. Smith Griswold.
February 5	Filed deposition of Hugh E. Petersen.
February 5	Filed deposition of Bruce C. Netschert.
February 5	Filed deposition of Peter O. Steiner in two volumes.
February 5	Filed deposition of Thomas H. Latimer in two volumes.
February 5	Filed deposition of John M. Morris in two volumes.
February 5	Filed deposition of Robert H. Inman.
February 5	Filed deposition of Joseph C. Tabor.
February 5	Filed deposition of Thomas J. Tarzy in two volumes.
February 5	Filed deposition of B. H. Sloane.
February 5	Filed deposition of John P. Maguire.
February 5	Filed deposition of Harold K. Pedersen.

Date	
1978	
February 5	Filed deposition of Charles W. Stadell.
February 5	Filed deposition of Martha Terleke.
February 12	Filed Plaintiff's Exhibits in Twenty (20) Volumes.
February 12	Clerk's file copy of transcript of proceedings had before Hon. Edwin A. Robson, on March 26, 1969, May 1, 1969 in 2 volumes, July 8, 1969, July 14, 1969, September 4, 1969, October 3, 1969, November 5, 1969, January 30, 1970, February 13, 1970, March 4, 1970, March 13, 1970, March 30, 1970, April 7, 1970 in 2 volumes, April 8, 1970 in 2 volumes, April 9, 1970 in 2 volumes, April 13, 1970 in 2 volumes, April 14, 1970, April 15, 1970 in 2 volumes, April 16, 1970 in 2 volumes, April 17, 1970, April 20, 1970 in 2 volumes, April 21, 1970 in 2 volumes, April 22, 1970 in 2 volumes, May 1, 1970, March 30, 1970 in 2 volumes, March 31, 1970 in 2 volumes, April 1, 1970 in 2 volumes, April 2, 1970 in 2 volumes, April 3, 1970, April 6, 1970 in 2 volumes, June 30, 1970 and June 8, 1971, Filed by the Official Court reporter in 48 Volumes.
February 15	Filed Defendant's Exhibits in 21 Volumes.

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION,
THE UNITED ELECTRIC COAL COMPANIES AND
FREEMAN COAL MINING CORPORATION, DEFENDANTS

Equitable Relief Sought

Filed: September 22, 1967

COMPLAINT

The United States of America, by its attorneys, acting under the direction of the Attorney General of the United States, brings this action against the defendants named herein, and complains and alleges as follows:

I

JURISDICTION AND VENUE

1. This complaint is filed and this action is instituted under Section 15 of the Act of Congress of October 15, 1914 (15 U.S.C. § 25), as amended, commonly known as the Clayton Act, in order to prevent and restrain the violation by the defendants of Section 7 of that Act.

2. Each of the defendants is found and transacts business within the Northern District of Illinois, Eastern Division.

II

DEFENDANTS

3. General Dynamics Corporation (hereinafter referred to as "GD") is named a defendant herein. GD is a corp-

oration organized and existing under the laws of the State of Delaware and maintains its principal place of business in New York, New York. GD is engaged in the manufacture and sale of a wide variety of products associated with, among others, the defense, space, nuclear, and electronic industries. GD, through subsidiaries, is also engaged in the mining and sale of coal. For the year ended December 31, 1965, GD had net sales of $1,472,785,000 and net profit after taxes of $49,269,000.

4. The United Electric Coal Companies (hereinafter referred to as "UEC") is made a defendant herein. UEC is a corporation organized and existing under the laws of the State of Delaware and maintains its principal office in Chicago, Illinois. UEC, which was incorporated under the laws of the State of Delaware in 1918, was merged into UEC Corporation on November 7, 1966. The name of the surviving corporation, which was incorporated under the laws of the State of Delaware on October 13, 1966, was changed to The United Electric Coal Companies. Any reference to UEC includes the predecessor of UEC. UEC operates four bitumonius coal mines, all of which are located in the State of Illinois. For the year ended December 31, 1965, UEC had net sales of $21,803,576 and net profit after taxes of $2,467,744.

5. Freeman Coal Mining Corporation (hereinafter referred to as "Freeman") is made a defendant herein. Freeman, an Illinois corporation with its principal office located in Chicago, Illinois, is a wholly owned subsidiary of GD. Freeman operates four bituminous coal mines, all of which are located in the State of Illinois. In 1965 Freeman had net sales of $31,665,837 and net profit after taxes of $1,114,220.

III

DEFINITIONS

6. The Eastern Interior Coal Province is defined as the bituminous coal field which blankets sixty-seven per cent of Illinois and much of southwestern Indiana and western Kentucky. This bituminous coal field constitutes a single, large bituminous coal region which is geologically united.

7. The Eastern Interior Coal Province sales area is

defined as the area of Illinois, western Indiana, western Kentucky, western Tennessee, eastern Missouri, eastern Iowa, southwestern and central Wisconsin and southeastern Minnesota.

IV

TRADE AND COMMERCE

8. Bituminous coal represents one of the most important of the mineral resources in the United States. In the modern industrial economy bituminous coal is of critical importance in providing a dependable and low-cost source of energy. This is particularly true with respect to the electric power utilities which now consume more than half of the total United States consumption of coal. The requirements of the electric utilities for coal are expanding.

9. In the more than two centuries in which coal has been mined in the United States, it is estimated that less than 4 per cent of the nation's known recoverable reserves or coal have been produced and consumed. It is estimated that the United States now has between 830 billion tons and 2,000 billion tons of coal reserves which can be recovered. At the present rate of United States coal production this is enough coal to last more than 1,500 years.

10. Bituminous coal production in the United States in 1965 and 1966 amounted to 512,088,000 tons and approximately 532,000,000 tons, respectively. It is estimated that in 1967, 545,000,000 tons of bituminous coal will be produced in the United States.

11. In 1965 the State of Illinois ranked as the fourth largest bituminous coal producing State in the United States with an output of 58,232,480 tons. However, Illinois is the leading State in bituminous coal reserves with estimated recoverable reserves as of January 1, 1967 of 67,800,000,000 tons.

12. Because of the high cost of transporting bituminous coal, customers endeavor to purchase bituminous coal which is mined as close to the customers' bituminous coal consuming facility as possible. In 1965 approximately 76 per cent of the bituminous coal sold in Illinois was pro-

duced in Illinois and approximately 58 per cent of the bituminous coal produced in Illinois was sold in Illinois.

13. The Eastern Interior Coal Province produced a total of 113,247,682 tons of bituminous coal in 1965. It is estimated that approximately 80 per cent of the bituminous coal consumed in the Eastern Interior Coal Province sales area was produced in the Eastern Interior Coal Province.

14. In 1965 Freeman, a wholly owned subsidiary of GD, produced 7,257,856 tons of bituminous coal from its mines which are all located within Illinois and ranked second in the production of bituminous coal in Illinois with 12.46 per cent of total 1965 Illinois bituminous coal production. In 1965 at least 63 per cent of the bituminous coal sales of Freeman were to electric utility customers and at least 18 per cent were to industrial customers. In 1965 approximately 47 per cent of Freeman's total production was sold to customers located in the State of Illinois, accounting for approximately 7.8 per cent of the bituminous coal sold in Illinois in that year. From its mines located in Illinois, Freeman regularly sells and ships bituminous coal to customers located in other States in the United States.

15. In 1965 UEC produced 5,348,641 tons of bituminous coal from its mines which are all located within Illinois and ranked third in the production of bituminous coal in Illinois with 9.18 per cent of total 1965 Illinois bituminous coal production. In 1965, 73 per cent of the bituminous coal sales of UEC were to electric utility customers and 23 per cent were to industrial customers. In 1965 approximately 72 per cent of UEC's production was sold to customers located in the State of Illinois, accounting for approximately 8.5 per cent of the bituminous coal sold in Illinois in that year. From its mines located in Illinois, UEC regularly sells and ships bituminous coal to customers located in other States in the United States.

16. If GD had owned UEC during all of 1965, GD would have ranked second in bituminous coal production in Illinois with 21.64 per cent of the total 1965 Illinois bituminous coal production. The 1965 combined bitum-

inous coal production of GD and UEC in Illinois was more than twice the production of the next largest Illinois bituminous coal producer. The combination of GD and UEC ranks as the second largest seller of bituminous coal in Illinois.

17. In 1965, Freeman, a wholly owned subsidiary of GD, ranked fourth in the production of bituminous coal in the Eastern Interior Coal Province, accounting for approximately 6.41 per cent of total 1965 production. UEC ranked sixth in the production of bituminous coal in this area, accounting for approximately 4.72 per cent of total 1965 production.

18. If GD had owned UEC during all of 1965, GD would have ranked second in production in the Eastern Interior Coal Province with 11.13 per cent of this area's total 1965 coal production. The combination of GD and UEC ranks as the second largest seller of bituminous coal in the Eastern Interior Coal Province sales area.

19. The bituminous coal industry is highly concentrated among the leading producers due in large part to mergers. In Illinois in 1965 the three leading producers of bituminous coal, Peabody Coal Company, Freeman, and UEC, accounted for approximately 50 per cent of total Illinois production. In 1965, these companies accounted for approximately 42 per cent of total bituminous coal production in the Eastern Interior Coal Province.

20. Freeman and UEC have been direct and substantial competitors in the sale of bituminous coal to customers located primarily in the State of Illinois. In 1965 at least 53 per cent of Freeman's dollar sales and approximately 61 per cent of UEC's dollar sales were to the same customers.

V

OFFENSE CHARGED

21. Material Service Corporation, as of December 30, 1959, had acquired approximately 34.27 per cent of UEC's outstanding stock. Freeman at that time was a wholly owned subsidiary of Material Service Corporation.

22. On or about December 31, 1959, GD acquired the Material Service Corporation. As a result of GD's acquisition of Material Service Corporation, GD acquired a stock investment in UEC equal to approximately 34.27 per cent of UEC's outstanding shares and Freeman became a wholly owned subsidiary of GD. By December 1963 GD had acquired over 50 per cent of the outstanding shares of UEC, and on October 5, 1966 GD offered to purchase the remaining outstanding shares of UEC. By December of 1966 GD had acquired at least 90 per cent of the outstanding shares of UEC and shortly thereafter UEC became a wholly owned subsidiary of GD.

23. The effect of the acquisitions by Material Service Corporation and by its successor, defendant GD, of UEC's stock has been and will be substantially to lessen competition or trend to create a monopoly in the production and sale of bituminous coal in the State of Illinois and in the Eastern Interior Coal Province sales area, and in various other sections of the country, in violation of Section 7 of the Clayton Act in the following ways, among others:

(a) Actual and potential competition between GD's wholly owned subsidiary Freeman and UEC has been eliminated;
(b) Actual and potential competition generally in the production and sale of bituminous coal may be substantially lessened; and
(c) Concentration in the production and sale of bituminous coal has been and may be further increased.

PRAYER

WHEREFORE, plaintiff prays:

1. That the acquisition described in paragraph 22 of this complaint be adjudged a violation of Section 7 of the Clayton Act.

2. That a preliminary injunction issue enjoining defendants GD, Freeman, and UEC, their officers, directors, employees, and agents pending adjudication of the merits of this complaint from:

(a) Taking any further action to change, directly or indirectly, the operation of the business of UEC or the personnel connected with such operation; and

(b) Shifting sales, personnel, or equipment or any assets whatsoever of UEC to any of the mines and facilities of GD and Freeman.

3. That GD be required to divest itself of all the stock and assets of UEC acquired or resulting from the acquisition.

4. That GD and Freeman be enjoined from acquiring stock or assets of any other firm engaged in the production or sale of bitmuinous coal in the State of Illinois or in the Eastern Interior Coal Province.

5. That the plaintiff have such other and further relief which the Court may deem just and proper.

6. That the plaintiff recover the costs of this suit.

Dated:

/s/ Ramsey Clark
RAMSEY CLARK
Attorney General

/s/ Donald F. Turner
DONALD F. TURNER
Assistant Attorney General

/s/ Baddia J. Rashid
BADDIA J. RASHID

JOHN E. SARBAUGH

BERTRAM M. LONG
Attorneys, Department of Justice

EDWARD V. HANRAHN
United States Attorney

JOHN T. CUSACK

Attorney, Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604
353-6975

AFFIDAVIT

STATE OF ILLINOIS)
) ss
COUNTY OF COOK)

JOHN T. CUSACK, being duly sworn, deposes and states that he is an attorney employed by the United States Department of Justice; that he has been actively engaged in the preparation of this proceeding; that he has read the foregoing Complaint and knows the contents and is familiar with the subject matter thereof; that he is informed and believes that the allegations of fact contained therein are true; and that his information consists of data, documents, and written statements supplied the Department of Justice by the defendants and information obtained from recognized trade and Government sources.

/s/ John T. Cusack
JOHN T. CUSACK

Subscribed and sworn to before me this day of , 1967.

/s/ Kathryn M. Reilly
Notary Public

My commission expires March 22, 1969.

[8]

EXCERPTS FROM DEPOSITION OF FRANK NUGENT, TAKEN SEPTEMBER 10-11, 1968

* * * *

FRANK NUGENT,

called as a witness by the plaintiff herein, having been by me, the said Frances B. Spina, as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR CUSACK:

Q Please state your full name.
A Frank Nugent.
Q What is your home address?
A 1630 Sheridan Road, Wilmette, Illinois.
Q By whom are you employed, Mr. Nugent?
A General Dynamics Corporation.
Q And what is your position at General Dynamics?
A Group Vice-President.
Q And where is your office located?
A 300 West Washington Street.
Q Could you give us a little something about your educational background, Mr. Nugent?
[4] A Evanston High School, a good many years ago, and I can't tell you the year, plus night school work, and so forth; private tutoring, I guess you could say.
Q When did you first go into business?
A I went in the coal business in 1920 with the Rock Island Coal Mining Company. I remained there for a short period of time, and then went to work for the Freeman Coal Mining Corporation on November 14, 1921.
Q Was Freeman at that time headquartered in Chicago?
A Yes.

Q And where were its mines located?

A It was a sales company, and until 1922 it had no coal mines. It was a jobbing company. In 1922 it acquired a coal mine.

Q By "a jobbing company," you mean it sold the coal produced by others?

A Wholesale, yes.

Q And where was the first mine?

A The first mine was the Bobby Dick Mine located in Williamson County in Southern Illinois.

Q And that was in 1922?

[5] A August 24, 1922, I believe.

Q Mr. Nugent, would you please tell us what your duties were at Freeman?

A I started off as a cost accountant, from that into traffic work, and from traffic work into sales work.

Q Traffic work, what does that involve, sir?

A Freight rates, and so forth.

Q From the mine to the customer?

A From the mine to the customer.

Q And this is an important aspect of the coal business?

A Very much so.

Q After 1922, sir, what mines did Freeman open? Can you tell us?

A Well, we had a mine at Johnson City, I don't remember the year, and we later had a mine at Du Quoin, Illinois. We also represented mines that we didn't own, sold coal for them.

Q As a wholesaler?

A As a Wholesaler.

I think we operated in that fashion until we acquired a mine from the Great Western Railway, and I think that was in the early 1930's. [6] That was known as the Seymour Mine.

Q This Seymour Mine that was acquired from the Great Western Railway, would that have been around 1932?

A Just about. I would think somewhere in there.

Q Do you recall where that mine was located, sir?

A It was just outside of Herrin, Illinois.

Q That is in the Southern Illinois mining district?
A Southern Illinois, yes.
Q And how big a mine was that?
A It was a small mine, I think two or three thousand tons a day.
Q Do you recall how much this cost Freeman?
A No, I don't.
Q Directing your attention, sir, to the middle 1930's, how many mines did Freeman operate?
A I think we had operated the Bobby Dick Mine and Seymour Mine, and we built a mine that we called Freeburn. I don't recall the year that we put that mine in.
Q Do you know where that mine was located?
[7] A It was located adjacent to the mine that was owned by the Cosgrove Coal Company, just outside of Herrin and off Highway 37, just to the west of Highway 37 and a little north of Johnson City.
Q Do you recall the approximate production of that mine, sir?
A It was around, I think 3,000 tons a day, 4,000, perhaps.
Q I see. Going then to the late 1930's and the early 1940's how many mines did Freeman operate?
A We next put in the No. 4 Mine. I believe that was in 1942 or thereabouts, and it was over near a little town there. I can't think of the name there, but it was in Williamson County.
Q Williamson County, Illinois?
A Yes.
Q Directing your attention, then, sir, to 1942, you had the No. 4 mine at Williamson County.
A Yes.
Q What other mines were at that time operated by Freeman?
A I am not so sure that the Bobby Dick [8] Mine was still in operation at that time, but we operated the Freeburn Mine, and then we—yes, the Bobby Dick Mine was in operation. We had Bobby Dick, Freeburn, and I think at that time we had perhaps closed Seymour down, but I am not sure.

Q So at least you had the No. 4, Freeburn, Bobby Dick, and possibly Seymour.

A Yes.

Q Can you recall, sir, the production of Freeman Coal in 1942, approximately?

A Oh, I think that No. 4 was around 4,000 tons a day, and I believe Freeburn was about the same. Bobby Dick, if it was in operation, probably was a little less.

Q Could you tell us, sir, the yearly production of all of Freeman in 1942, approximately?

A Oh, only just by multiplying those figures perhaps by 200 days a year, maybe a little less.

Q Would it be over a million tons?

A I would imagine perhaps so.

Q At 200 days a year, 4,000 tons would be 800,000 tons a year from the No. 4, and if [9] the Freeburn was approximately the same, 4,000 tons a day for 200 days, that would again be 800,000 tons.

A Yes.

Q So your production then would be in excess of a million six in 1942, approximately?

A Perhaps so, yes. I don't recall.

Q What was the production of Bobby Dick when it was in operation, sir? Do you know, approximately?

A That is a long time back. I guess around two or three thousand tons a day.

Q Two or three thousand tons a day?

A I am not sure of that.

Q I see. Now, did Freeman undergo any more acquisitions after the acquisition of this mine from the Great Western Railroad in 1932, any further acquisitions of mining property between 1932 and 1942?

A No.

Q Did Freeman have any affiliation with the Burton Coal Company?

A Burton was a sales company.

* * * *

[13] Q In what year did Material Service [14] acquire Freeman and Burton?

A In 1942. Not Burton. At that time I don't believe they acquired Burton, although I am not sure.

Q When did Material Service acquire Burton?

A Well, if they did acquire Burton, and I am not so sure that they did, it would have been in 1942.

Q Is Burton Coal still in existence?

A No, no.

Q Do you know what happened to it?

A No, I really don't.

Q Did Freeman start to handle its own sales?

A Yes, as Freeman Coal.

Q In what year was this?

A I believe we went under the name of Freeman in 1942, although I am not sure.

Q When Material Service purchased Freeman, did Freeman become a wholly-owned subsidiary of Material Service Corporation?

A Yes.

* * * *

[44] Q I would appreciate, sir, if you would check on the 1966 dividends of Freeman, which may or may not be indicated in Nugent Deposition Exhibit 8-A.

Now, Mr. Nugent, let's go back a little bit and try to get through quickly here the history of Freeman.

In 1953 or 1954 Freeman was a wholly-owned subsidiary or controlled by Material Service Corporation, is that correct, sir?

A Yes.

Q And it was headquartered here in Chicago?

A Yes.

Q And you were President at the time, sir?

A I don't recall. I have been President, I think for ten or twelve years. I would say perhaps so, either President or Executive Vice-President.

* * * *

[109] MR. HEDLUND: I think there may have been some confusion in the mine numbers, which Mr. Nugent—

MR. CUSACK: Off the record.

MR. HEDLUND: Let's stay on the record.

MR. CUSACK: All right, stay on the record.

MR. HEDLUND: —which Mr. Nugent may have used. I was not certain. I thought that there may have been some confusion between Orient No. 3 and Orient No. 5, but when we get the transcript back we can make sure.

MR. CUSACK: Certainly.

BY MR. CUSACK:

Q What I am trying to establish now, Mr. Nugent, is of the four Freeman mines now in operation, Orient No. 3, Orient No. 4, Orient No. 5 and the Crown Mine, and the Orient No. 6 Mine which will be in production in 1968, this year, which of these mines have unit train loading facilities?

A At the present time only Orient No. 5, and a unit train loading facility is being constructed at Orient No. 6.

Q Orient No. 6 and Orient No. 5 are both in the Southern Illinois Freight Rate District?

[110] A Southern Illinois Freight Rate District, yes.

Q The Crown Mine is located at Farmersville in Montgomery County, Illinois, is that correct, sir?

A Yes, sir.

Q That is about 30 miles south of Springfield?

A Approximately 25, I think.

Q Where does the production of this mine go?

A Two million tons a year, or a little less than that, goes to the Commonwealth Edison Company.

Q What destination, sir?

A It's usually shipped to Havana, Illinois, for loading into barges.

Q Havana is located on the river?

A On the river, on the C. & I. M. Railroad.

Q That is the Chicago and Illinois Midland?

A Chicago and Illinois Midland.

Q Is it then shipped by barge into the Chicago area?

A Yes, to Edison stations.

Q Do you know by any chance which particular stations it goes to?

A To all of them at one time or another.

Q To all of the facilities.

[111] MR. HEDLUND: To all of the river stations.

BY THE WITNESS:

A All of the river stations, of course.

BY MR. CUSACK:

Q The same stations served by United Electric through its barge?

A Yes, sir.

Q Barge line I should say.

A Yes, sir.

Q Through its production from Fulton County?

A The Buckheart Mine.

Q Could you tell us where most of the production of the Orient No. 5 Mine goes?

A It is pretty generally spread. We have started to ship on a unit train contract to the Union Electric Sioux Plant. It's not now moving at the rate of a million tons per year, and it will be moving at that rate at a later date, but in the meantime the movement of that coal is pretty widely spread.

Q Does any of this coal go into Wisconsin, for example?

A Yes, some of it does go into Wisconsin.

Q Could you tell me whether it goes up directly on rail to Wisconsin?

[112] A Up to the time that the Rail-To-Water Facility, or prior to the time that the Belt Railway was on strike, it moved over the lake to Wisconsin Electric Power, Wisconsin Public Service, and others.

Q Could you explain, sir, for the purposes of the record, just a little bit on how the coal goes? Does it go by rail from Orient No. 5?

A The coal would go by rail from Orient No. 5 by the Illinois Central Railroad, and it could go by other roads to Chicago. At Markham, Illinois, an Illinois Central transfer point, it's turned over to the Belt Railway. The Belt Railway carries it to a Rail-To-Water transfer facility. That is located at about 103rd street on the river.

The Belt Railway has been on strike some four weeks,

and movement has been interrupted and now the coal is moving elsewhere.

Q Could you give us some idea of the amount of the production of Orient No. 5 that ended up in Wisconsin in 1967?

A Well, it would be a guess because we put coal into Wisconsin Electric Power from all mines in Southern Illinois. Coal could move from 3, 4 or 5.

Q Orient No. 3, 4 or 5?

[113] A I don't have any direct knowledge as to how much came from each property.

Q But it does move from each of the three Orient Mines, Orient 3, 4 and 5, into the Wisconsin area?

A Yes, sir.

Q Does it go to Sheboygan?

A No, it goes to Oak Creek.

Q Where is that located, sir?

A Oak Creek is this side of Milwaukee.

Q Is it on Lake Michigan?

A On Lake Michigan.

Q Does Freeman supply any facilities in Wisconsin outside of the Lake Michigan Shore, other than at Oak Creek?

A You mean rail shipments to points?

Q Yes, sir.

A Yes, I'm sure we do, but I couldn't name the accounts to you. They may be small.

Q I see.

We have established that most of the production of Crown Mine goes by combination of rail and barge to Commonwealth Edison.

A Yes, sir.

[114] Q On its river-served plants.

A Yes, sir.

Q We have also established that Orient 5's production is fairly well distributed at the present time.

A Yes, sir.

Q Do you know if any of the Orient 5 production goes into Tennessee to TVA?

A Yes. I think it does, but not necessarily into Tennessee. It would go into the Shawnee plant on the Ohio River, just across from Joppa, Illinois.

Q In Kentucky?

A Yes. Most likely not in Tennessee, although it could move there.

Q In regard to Orient No. 5, are you serving the St. Louis metropolitan area with coal from Orient 5?

A Yes, sir.

Q Served actually in St. Louis in Missouri?

A Yes, sir.

Q Does any of your coal from Orient No. 5 go into Iowa, if you know?

A Yes.

Q What customers do you serve there by Orient 5?

A I couldn't call them to you by name, but [115] it's a natural market for us, and I'm sure that we do serve people in the market because we are competitive in the area.

Q In regards to Orient No. 4, could you tell us approximately where the production of this coal went in 1967?

A I think that you could say that Orient No. 4 moved in about the same manner as the coal from No. 5 moved, and in pretty much the same market.

Q If I may repeat, and correct me if I am wrong, it would then move into Wisconsin, Iowa—

A Yes, sir.

Q —St. Louis metropolitan area—

A Yes, sir.

Q —Western Kentucky—

A Not likely, no, sir.

Q Not likely.

A Only to the extent that it could move to the Shawnee plant of TVA.

Q —and into Illinois?

A And into Illinois.

Q In regard to the Orient No. 3 Mine, could you give us some idea of where the production of most of that coal would go in 1967?

[116] A Well, Orient No. 3 is a low sulphur coal, a specialty coal. It's moved into the St. Louis market, it's moved into—to people that require for one reason or another low sulphur coal, cement plant people, of course,

need low sulphur coal for special plants and special purposes, lime people, such as that. It has a broader market, however. It can move into the same market that Orient No. 5 and Orient No. 4 serve.

Q In regard to the 1967 production of the mines of Freeman, could you tell us if any coal moved into Minnesota from any of your mines?

A We can move into Minnesota competitively. It's at the extreme end of our market, and I can't tell you definitely that we did move coal there.

Q But you could have?

A We could.

Q Mr. Nugent, in regard to markets in coal generally, is it a fair thing to say that a coal company, as any business corporation, desires to maximize its profits? That is a fair statement, is it not?

A Yes. We try to make as much money as we can. We have to pay taxes to support this Justice [117] Department.

Q There is nothing reprehensible in this and this is a desirable thing to maximize profits.

A We certainly believe in the profit motive.

Q Insofar as the production and sale of coal is concerned, would it be a fair thing to say that there are two general costs involved, one being the cost of getting the coal out of the ground, processing it and sizing it and loading it—that would be one major cost, is that correct, sir?

A Yes.

Q The other major cost would be transportation, is that correct?

A Yes, sir.

Q Is it a fair statement to say that transportation costs are a very large percentage of the costs to deliver coal?

A I don't know that I would use the word "large", but it is an important factor in determining the area in which you can be competitive.

Q In regard generally to the experience that you had with Freeman and United Electric, what would be the average cost of delivered coal for your customers? What

percentage of that would be [118] attributed to transportation charges?

MR. HEDLUND: Are you asking for all customers?

MR. CUSACK: Just as a general rule.

MR. HEDLUND: A general average for all customers?

MR. CUSACK: Yes.

MR. HEDLUND: I would like to have the question read back, please.

Q (Read by the reporter.)

MR. HEDLUND: I am not certain that I understand the question, but if Mr. Nugent does, he may answer.

BY THE WITNESS:

A I don't know how that could be answered. The spread is too great. For instance, the rate to the Ohio River moving south to, say, the Shawnee plant, is in the neighborhood of a dollar.

A Is that a dollar a ton, sir?

A A dollar a ton. Obviously, that is not a large portion of the total delivered price. The rate into the Sioux plant on the unit train movement, again is a dollar. The rate to Chicago on a single car is very close to $4. I think the rate to the [119] Rail-To-Water transfer facility—and I'm not up to date on my freight rates—I think it is in the neighborhood of $2.15 to $2.20 a ton, so you have a wide spread, depending on the movement and on the volume and the location.

Q Is it a fair statement to make, Mr. Nugent, that a coal company endeavors to sell as much of its coal as close as it can to its mines, because in this manner the cost of transportation is less than if they had to ship the coal great distances?

A Well, the cost of transportation is less, but I don't know that we make any particular effort to sell it nearby. The further you get away the more highly competitive—the further you get away from the mines, the more highly competitive the market becomes.

Q I see.

You mentioned in regard to the unit train price that you have $1 a ton. This moves from Orient No.—

A No. 5 to the Sioux plant of the Union Electric Company. This figure must be approximate.

Q Yes, sir, I understand.

Is it a fair statement to make that with [120] the advent of the unit train rates, which as I understand is a fairly recent innovation in the coal mining business—

A Yes, sir.

Q —coal companies have been able to ship their coal economically much greater distances. Is that a fair statement?

A Yes, it is.

Q Is it also a fair statement to say that the greater the distance the coal is shipped the higher the transportation costs?

A Yes, sir.

Q Is it also a fair statement to say that with the advent of the unit train the distance to which coal can be shipped economically has been greatly increased?

A Yes, sir.

Q Does the shipment of coal by barge also enable coal to be shipped further distances economically?

A Not necessarily because, of course, you are limited to where you can go by barge, and water transportation has been more economical than rail transportation for quite some time, and barge operations [121] have been used for—transportation by river has been used for a great many years.

• • • •

[181] Q Do industrial consumers of coal purchase coal for the generation by themselves of electrical power?

A No, I'd say not. On a rare occasion that might take place.

Q What do industrial users use coal for?

A Usually for processing in a plant. Power can generally be purchased cheaper than they can generate it, so —for instance, a corn products plant will use it for producing steam for processing purposes, and a cement mill will use it for burning limestone.

Q In your opinion, Mr. Nugent, who are the competitors of Freeman Coal?

A Well, the immediate competitors of Freeman Coal are the other producers in the Southern Illinois field. Now, to a degree, producers in the Belleville district do compete with producers of the Southern Illinois coal. There is little or no competition between the producers in the Belleville field and the producers in the Southern Illinois field. * * *

[190] Q You could have it blended at the destination of the customer?

A The customer at his own expense might blend it.

Q Does Union Electric blend any coal from the Belleville mining district and from the Southern Illinois mining district?

A I don't know that they do, but the Union Electric Company takes dust out of Southern Illinois, again a by-product, and it goes into the same plant, and they can blend it with Belleville if they choose to do so.

Q The same plant that is supplied by Belleville coal?

A Yes.

MR. CUSACK: Thank you.

MR. HEDLUND: Would this be a good place to stop, Mr. Cusack?

MR. CUSACK: Yes.

(WHEREUPON the taking of the deposition of FRANK NUGENT was adjourned to Wednesday, September 11, 1968 at 10:00 o'clock a.m.)

* * * *

[198] Q Mr. Nugent, the freight rate of the mines located within the Belleville District is less than that of the mines located in the Southern Illinois District for shipments into the St. Louis area, is that correct?

A Yes, sir.

Q Would you tell us approximately how much less on a carload lot?

A In the neighborhood of 12 to 15 cents a ton less from Belleville than from Southern Illinois.

Q Mr. Nugent, I assume that any mine in the Belleville District could ship to the Alton plant of Union Electric at as favorable a freight rate as that on which Freeman Orient No. 5 coal is shipped to the Alton plant, is that correct?

A Will you repeat that again for me, please?

MR. CUSACK: Will you read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A No more favorable rate has been published from the Belleville District than the existing rate from the No. 5 mine to the Sioux [199] plant.

BY MR. CUSACK:

Q In other words, Mr. Nugent, is it a fair statement to say that if a mine in a Freight Rate District with a generally less favorable tariff to a particular marketing area obtains a unit train rate, it can ship its coal cheaper than that coal mined in a Freight Rate District closer to that producing area?

A Not necessarily.

Q Will you please explain your answer.

A If the Sioux plant is on the Burlington Railroad, and since it is on the Burlington Railroad, the No. 5 mine is able to ship to the Sioux plant without involving any other railroad.

The Burlington Railroad does not serve mines in the Belleville District, so any movement from the Belleville District to the Sioux plant would necessarily be a two-line or perhaps a three-line haul.

* * * *

[213] Q Is it not a fact, Mr. Nugent, that [214] the Commonwealth Edison Company does not purchase coal outside of the Eastern Interior Coal Province?

A This term "Eastern Interior Coal Province" is new to me in this case, but if by that you mean Illinois, Indiana and Western Kentucky, that is the usual area in which they do purchase coal.

Q Now, in regard to the Union Electric Company, Mr. Nugent, Nugent Deposition Exhibit 39-B indicates what to you in regard to Union Electric?

MR. HEDLUND: Mr. Cusack, I think the document speaks for itself. Now, I do not understand what you mean by the question, "What does it indicate to you?"

Are you asking him what the document shows? If so, I think the document speaks for itself.

MR. CUSACK: Mr. Hedlund, this document was prepared by Mr. Tarzy at the direction of Mr. Nugent. We would like to know what it means to Mr. Nugent, what does it indicate to him and what does it show to him in regard to the Union Electric Company.

[215] MR. HEDLUND: I submit that the document shows what it shows. The document shows figures for Illinois coal and for Midwestern coal.

MR. CUSACK: Off the record, please.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. CUSACK: On the record.

BY MR. CUSACK:

Q Mr. Nugent, I ask you again to re-examine Nugent Deposition Exhibit 39-B, including the heading, including the statement on the top which has an asterisk and then the following statement:

"Denotes use of additional coal from sources other than Illinois, Indiana and West Kentucky."

I want you to examine this, please, sir, and tell us what this document means to you in regard to the listed utilities.

A Well, first, it may not be entirely accurate, and I do not know that the consumption figures indicated hereon are identical with those [216] filed with the Federal Power Commission by each of these utilities.

The figures were perhaps secured at a time when all the complete records were not available, so I assume that it is reasonably accurate but not necessarily so.

Now, as to the asterisk shown on here, where it denotes the additional coal from sources other than Illinois, Indiana and Western Kentucky, the TVA, for example, used, according to this report, 15,870,000 tons of coal, coal from the Midwestern field and coal from other sources.

Now, since the TVA has plants in Tennessee and uses Tennessee coal, obviously there is coal from Tennessee, Eastern Kentucky and perhaps West Virginia, that went into the TVA system.

Q Is this for the TVA Eastern Tennessee plants?

A Yes.

Q Is it a fair statement to say that the Eastern Tennessee plants of TVA are supplied by coal mined in Eastern Tennessee and Eastern Kentucky?

[217] A Yes, sir.

Q But that the TVA plants located in Western Tennessee are supplied from mines located in Western Kentucky and in Illinois?

A That is reasonably correct.

Q Is it fair to say from this statement, that is, Nugent Deposition Exhibit 39-B, that the coal consumed by Commonwealth Edison is produced mostly in the State of Illinois, that is, in 1963, 10,450,000 tons of coal mined in Illinois was consumed by Commonwealth Edison out of its total purchases of 11,350,000 tons?

A Yes, sir.

Q On the basis of this document, Mr. Nugent, do you feel that the public utility companies located in the State of Illinois purchase most of their coal from mines located in Illinois?

A Yes, sir.

Q Could you give us the reason for that, if you know?

A Basically transportation costs.

Q It is a fact, then, is it not, Mr. Nugent, that the coal producers with mines located in Illinois, Indiana and Western [218] Kentucky, that is, in mining Districts 9, 10 and 11, enjoy a favorable competitive advantage over coal mined anywhere else in the United States, in regard to customers located in Illinois, Indiana, Western Kentucky, Missouri, Southeastern Minnesota and most of Wisconsin?

MR. HEDLUND: May I have the question read, please.

Q (Read by the Reporter.)

MR. CUSACK: Together with Western Iowa.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

MR. EISEN: Mr. Nugent, I know that it might be helpful to you to be looking over Mr. Hedlund's notes, but it is really not appropriate in a deposition.

MR. HEDLUND: Let's show, then, what I have in my notes.

MR. EISEN: I am sure there was not any—

MR. HEDLUND: I will ask the Court Reporter to transcribe them in the record so that it is clear that I am not writing [219] notes and coaching Mr. Nugent.

MR. EISEN: I did not mean to indicate that you were.

MR. HEDLUND: I ask that the Court Reporter transcribe into the record what I have on that piece of paper.

MR. YOUKER (Notary Public): Let the record show that Mr. Hedlund has handed me a yellow sheet of paper on which appear the following inscriptions:

In the upper left-hand corner, "Freight Rate Districts", and two lines underneath that, "Unit rate possible", and two lines beneath that, "Joliet, arrow only R.R."

Each of those notations has an arrow preceding it, pointing to the right.

In the upper right-hand corner there are two columns of what appear to me to be abbreviations.

The left-hand column appears to read as follow:

"Ill. No.
Ia.
Minn.
Wisc.
Ind.
W.Ky.
W.Penn."

[220] The right-hand column appears to read as follows:

"Ohio
Penn.
E. Ky.
W. Va.
Va."

Below those two columns appear two other columns. The left-hand column bears at the top an inscription that looks like "Prod.", and beneath that appears:

"Ill.
Ind.
W. Ky."

To the right of that column appears at the heading the word "Customers." There appears to be a word to the left of "Customers", "mined", and a line may be drawn through it or not, I am unable to decipher.

Underneath those two incriptions appear:

"Ill.
Ind.
W. Ky.
Mo.
SE Minn.
Most of Wisc.
W. Iowa",

with a line drawn beneath them.

MR. HEDLUND: Mr. Nugent, if you [221] would like to take notes during your interrogation, you have the right to do so. There are paper and pencils here.

THE WITNESS: That is a very involved question and a long question. May I have a piece of paper to write something down?

MR. HEDLUND: Yes.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

THE WITNESS: Now, would you repeat the question, please?

Q (Read by the Reporter.)

MR. CUSACK: And Western Tennessee.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

MR. CUSACK: Please take your time, Mr. Nugent.

BY THE WITNESS:

A This is a rather involved question, and I think it could be simply stated in this fashion: I would like to state it in my own language and see if I have correctly inter- [222] preted it.

The question is, do the producers of coal in Illinois, Indiana and Western Kentucky have an advantage in serving customers in the Middlewest as against producers in fields other than Illinois, Indiana and Western Kentucky?

Is that the question in brief?

MR. CUSACK: You may answer that question.

BY THE WITNESS:

A Yes. The producers in Illinois, Indiana and Western Kentucky do have an advantage over producers in other districts in the territory that you have outlined.

BY MR. CUSACK:

Q What I am trying to delimit, Mr. Nugent, is the general borders of the area in which the Midwestern producers, that is, the producers operating mines in Mining Districts 9, 10 and 11, have an advantage over coal produced in other districts.

A Yes.

Q I think we established, at least in [223] regard to the TVA utility plants located in Tennessee, that the TVA plants located in Eastern Tennessee were supplied with coal by mines located in Eastern Tennessee and in Eastern Kentucky, while the TVA plants located in Western Tennessee were supplied, by and large, with coal produced in Western Kentucky and in Illinois.

A Yes, sir.

Q I am trying to delimit, somewhat at least, the boundaries here. Now, in regard to the boundary of Western Kentucky, that is, Western Kentucky being an area where customers located within Western Kentucky are served by the coal produced in Western Kentucky, Illinois and Indiana. Is that correct?

A Would you restate that, please?

MR. CUSACK: Will you read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A I am confused with that. I think that indicates that Indiana coal or Illinois coal is used by customers in Western Kentucky. Is that [224] the question?

MR. CUSACK: Yes, sir.

BY THE WITNESS:

A The word "customers" plural, would indicate somebody other than TVA.

Now, the TVA has a plant, the Shawnee plant, which is located in West Kentucky, but I know of no other plant in Western Kentucky that is served by producers in Indiana and Illinois.

BY MR. CUSACK:

Q Is the only large consumer of coal in Western Kentucky the Shawnee plant of TVA?

MR. HEDLUND: You had better state what you mean by "large."

BY MR. CUSACK:

Q Do you know of any customers for coal located in Western Kentucky who consume, on a yearly basis, over 50,000 tons of coal a year?

A I know that there are customers in Western Kentucky that consume more than 50,000 tons of coal a year.

Q Other than TVA?

A Yes.

Q Would you name them, please.

[225] A I cannot name all of them. The industrial complex near Calvert City, I am sure, has several plants that consume tonnage in that area, the Louisville Gas & Electric Company, and I am sure there are many others.

Q In regard to these customers located in Western Kentucky, where do their coal requirements come from?

A Generally speaking, from Western Kentucky.

Q And some from Illinois?

A Again, I think the Illinois tonnage is limited to coal that goes to the TVA plants.

Q Now, again, Mr. Nugent, trying to delimit somewhat the areas in the Middlewest where coal produced in Mining Districts 9, 10 and 11 has a competitive advantage, let's discuss the State of Iowa.

Could you please tell us what portion of Iowa, in your opinion, uses coal, most of which is mined within Illinois, West Kentucky and Indiana?

MR. HEDLUND: I would like to have that question read, please.

[226] Q (Read by the Reporter.)

BY THE WITNESS:

A The Eastern half of Iowa.

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q In regard to the state of Minnesota, will you tell us that portion of Minnesota which, in your opinion, uses coal which is mined within Illinois, Indiana and Western Kentucky?

A In Minnesota?

Q Yes.

A Those plants in Minnesota that are served on the Mississippi River and served by barge, secure their coal from the Belleville District, with some dust and carbon in limited quantities moving to perhaps some plants on the river.

The plants in Minnesota, in the northern part of Minnesota, are served off of the Lake Superior docks with coal from Lake Erie ports, eastern coal from Lake Erie ports.

Q So it is a fair statement to say that the coal mined in the Midwest would not go north of the southeastern portion of Minnesota, but [227] would serve that area?

A A better way to say it would perhaps be that coal from the Belleville District is used primarily at points on the Mississippi River in Minnesota, and there is very little other Illinois coal that moves into utility plants in Minnesota.

Q Does not coal mined from the Fulton-Peoria Mining District also go into plants in Minnesota?

A No, sir.
Q None at all?
A I know of none.
Q In regard to the State of Wisconsin, could you tell us the areas in Wisconsin where Midwest coal, that is, coal mined in Illinois, Indiana and Western Kentucky, has a substantial competitive advantage over coal mined anywhere else?
A With the exception of some coal shipped to Lake Michigan ports from Lake Erie ports, to plants such as Wisconsin Electric Power, Wisconsin Public Services and so forth, most of the coal that is used by utility plants [228] in Wisconsin comes from mines in Illinois, Indiana and Western Kentucky.
Q Thank you.
In regard to the state of Indiana, could you tell us that portion of Indiana where customers are located, which customers use coal mined in Illinois, Indiana and West Kentucky?
A Again, most of the coal that is used by utilities in the state of Indiana is produced by coal mines in the state of Indiana.
[229] Q Does Illinois coal go into Indiana?
A Yes, in that portion of Indiana which is included in the Chicago Switching District, Hammond and Gary, and there is some Illinois coal that has gone into the NIPSCO plant over there on Lake Michigan.
Q Would you spell "NIPSCO", please?
A Northern Illinois Public Service Company.
Q NIPSCO means Northern Illinois Public Service Company?
A Yes, sir.
Q Doesn't some Indiana coal go into Illinois?
A Yes, sir.
Q Could you tell us where it goes in Illinois?
A Well, Indiana coal moves over the northern part of Illinois. It is competitive.
Q With Illinois coal?
A Yes, sir.
Q In regard to the State of Missouri, Mr. Nugent, could you tell us that portion of the State of Missouri

where customers are located, in which Midwest coal, that is, coal mined in [230] Illinois, Indiana and western Kentucky, has a competitive advantage?

A First, there is some coal mined in the State of Missouri, and I think most of the coal that is mined in the State of Missouri is used by utility plants in the State of Missouri.

Very little Illinois coal is consumed in Missouri by utilities at points west of the Mississippi River.

Q The Union Electric Company, which is a St. Louis-based public utility company—is that correct?

A Yes.

Q It purchases all of its coal from Illinois, does it not?

A Yes, sir.

Q Is not Illinois coal superior to Missouri coal?

A Yes.

MR. HEDLUND: In what respect?

MR. CUSACK: He answered the question.

BY THE WITNESS:

A I presume you are talking about quality?

MR. CUSACK: Yes.

[231] BY THE WITNESS:

A Yes.

BY MR. CUSACK:

Q It is a superior quality coal?

A Yes, sir.

Q Mr. Nugent, is it a fair statement to say that most of the coal consumed in Illinois is mined in Illinois?

A Most of the coal consumed in Illinois is mined in Illinois?

Q Yes.

A Yes. I think that is a fair statement.

Q Thank you.

Mr. Nugent, I would like now to discuss a little bit with you the competition, or at least the potential competition between the mines operated by United Electric and the mines operated by Freeman.

We established yesterday, did we not, that the Fidelity mine of United Electric is approximately thirty-five miles to the west of the Freeman Orient No. 3 mine, the Orient No. 5 mine of Freeman, and the Freeman Orient No. 4 mine, is that correct, sir?

* * * *

[232] Q Is that located on the Mississippi River?

[233] A The Ohio River.

Q Has that plant been served by the Fidelity mine of United Electric?

A Yes.

Q Has that plant also been served by any of the Freeman mines?

A Yes, sir.

Q In your opinion, then, Mr. Nugent, would the Fidelity mine of United Electric be in competition with the Freeman mines for the business of the Shawnee plant of the Tennessee Valley Authority?

A No, sir.

Q Will you please explain your answer?

A Freeman entered into a contract with the TVA and by agreement with United Electric Coal Companies, we included the Fidelity mine so that if at any time they needed to dump some coal or if they had coal that could not be disposed of on the market place, they would have a right to apply it on that market, and it was only necessary for them to apply a very limited tonnage.

It is not a piece of business that they could enjoy profitably.

Q The coal that the Fidelity mine of United [234] Electric sold to the Shawnee plant was sold at a profit, though, was it not?

A I am not so sure that it was.

Q What is your best recollection with respect to that, Mr. Nugent?

A I would say that it was a very marginal piece of business for them, and it was something that they would only use in an emergency situation.

Q Is this because the Fidelity mine of United Electric has better customers?

A It is because the transportation cost is not competitive.

Q Mr. Nugent, is it not a fact that United Electric had a contract to supply TVA with coal?

A Yes, sir.

Q Was this coal from the Fidelity mine?

A Yes, sir.

Q Did United Electric bid on this contract?

A I believe it was a joint bid.

Q By United Electric and by Freeman?

A Yes, sir.

Q As a result of this joint bid and contract, coal from the Fidelity mine of United Electric as well as from the southern Illinois mines of [235] Freeman moved to the Shawnee plant of TVA?

A Yes, sir.

Q Mr. Nugent, the Banner mine of United Electric is located where, sir?

A On the Illinois River, not too far south of Peoria.

MR. CUSACK: Let the record show we are handing Mr. Nugent Mr. Jack Simon's map, which is Nugent Deposition Exhibit 38.

BY MR. CUSACK:

Q Mr. Nugent, when was the Banner mine of United Electric opened?

A Oh, I cannot recall specifically. It was several years ago.

Q With reference to coal mined at the Banner mine of United Electric, is it loaded onto barges at the mine?

A Yes, sir.

Q Is it a fact that the preparation plant is located contiguous to the Illinois River?

A Yes, sir.

Q Is the Banner mine of United Electric a profitable operation?

A Yes, sir.

[237] BY MR. CUSACK:

Q Mr. Nugent, I now hand you Nugent Deposition Exhibits 40-A, 40-B and 40-C for identification, and ask you to examine them, please.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY THE WITNESS:

A Yes.

BY MR. CUSACK:

Q Do you recall receiving this document, sir?

A Again, I am sure that you would not expect me to recall a document that I received in 1960, but since it is addressed to me, I am sure that I did receive it.

MR. CUSACK: Let the record show that it is not addressed to Mr. Nugent. It is addressed to Mr. Paul Weir, with a copy to Mr. Frank Nugent, President, Freeman Coal Mining Corporation.

BY MR. CUSACK:

Q Mr. Nugent, I ask you to examine Nugent Deposition Exhibit 40-A, in regard to the contracts for coal produced at the Banner mine.

[238] A Yes.

Q With reference to the Wisconsin Electric Power Company contract at Port Washington, Wisconsin, this is, is it not, for 50,000 tons of coal?

A Yes, sir.

Q The Wisconsin Electric Power Company plant at Port Washington, Wisconsin is located on Lake Michigan, is it not, sir?

A Yes, sir.

Q You testified yesterday, did you not, that Freeman supplied some coal to a utility plant in the State of Wisconsin located on Lake Michigan?

A If you are asking me if I testified that Freeman ships coal to the Wisconsin Electric Power Company on Lake Michigan, if you asked me that question, I am sure I said that we do.

Q What plant of the Wisconsin Electric Power Company do you ship to?

A Wisconsin Electric Power Company to Port Washington and to Oak Creek.

However, the coal is ususally consigned to Oak Creek and it only goes to Port Washington at the convenience of the Wisconsin Electric Power Company.

[239] Q I see. Now, the Oak Creek plant of Wisconsin Electric Power is located how far from the Port Washington plant, do you know?

A The Port Washington plant—Port Washington, as you know, is just to the north of the city of Milwaukee and Oak Creek is to the south of the city of Milwaukee.

Q What mine or mines of Freeman supplies the Oak Creek plant of the Wisconsin Electric Power Company?

A All of Freeman's Southern Illinois mines.

Q That is Orient No.—

A 3, 4 and 5.

Q Mr. Nugent, is the Banner mine of United Electric in competition with Freeman for the business of the Wisconsin Electric Power Company?

A No, sir.

Q Would you please explain why?

A The coal representing this tonnage of 50,000 tons—

MR. HEDLUND: Let the record show that the witness is referring to Nugent [240] Deposition Exhibit 40-A.

MR. CUSACK: Yes.

BY THE WITNESS:

A Exhibit 40-A before me indicates that there was a contract with the Wisconsin Electric Power for a one-year period for 50,000 tons of coal.

That coal had to be transported to Chicago by barge and transferred from the barge to a lake vessel. There is only one lake vessel equipped to handle a movement of this nature, and that is the steamer Roen, R-o-e-n, I believe it is.

It is a very unsatisfactory arrangement because of the time element involved. You have to have the barges there in time to meet the vessel, and a fleeting of barges, and it is slow and costly.

I think the cost of transporting coal through the use of the Roen as against the use of the rail-to-water facility, where a vessel can be loaded in a few hours as against

days for the Roen, is more than double and perhaps three times as costly.

[241] BY MR. CUSACK:

Q But it is a fact, is it not, that United Electric and Freeman both sold coal to Wisconsin Electric Power Company?

A In the year of 1960, and I do not believe that United Electric has shipped any coal to the Wisconsin Electric Power Company since that time and they are not shipping any coal in that fashion because the steamer Roen is not available to them.

Q Who has the steamer Roen tied up?

A Roen is using it for other purposes. It was not a satisfactory movement for him.

Q Do any of the Freeman mines ship to Ludington, Michigan?

A I think we have shipped some coal in the past to Dow Chemical, but in limited quantities.

Q But you have made shipments to Dow Chemical at Ludington?

A No. I cannot say that we have. I would have to check the records.

* * * *

[251] Q For Freeman?

A Yes.

Q Mr. Nugent, in your opinion, is the coal produced by United Electric from the Cuba, Buckheart and Banner Mines in competition with the coal produced by the Crown mine of Freeman for the business of the Commonwealth Edison Company?

A Will you restate that, please?

MR. CUSACK: Will you read the question, please, Mr. Youker?

Q (Read by the reporter.)

BY THE WITNESS:

A That word "competition" troubles me. If the coal were available in Fulton County in sufficient quantity and if they chose to make the price to secure the business,

coal from the Crown mine would not move to Edison's river stations.

BY MR. CUSACK:

Q But it does move, does it not?

A It does, yes, because the quantity of coal is not available in the Fulton County field to meet Edison's needs.

* * * *

[281] Q Did Freeman have any other salesmen working out of any other office than your Chicago office and your St. Louis office?

A No, sir.

Q Do you recall the names of any other salesmen of Freeman working out of the Chicago office?

A Yes. Jack Sheridan and Joe Zwickle.

Q Is Mr. Sheridan still employed by Freeman?

A Mr. Sheridan and Mr. Zwickle are both employed.

Q By Freeman?

A By Freeman.

Q All right.

A We have a man named Edwards up in Wisconsin, Gene Edwards, the name is.

Q Where does he work out of, sir?

A He works out of—I don't know where he makes his headquarters in Wisconsin.

Q He solicits customers of Freeman located in Wisconsin?

A That is right.

[282] Q Among which is Wisconsin Public Service Company?

A No. I do not believe he handles that account. Sheridan handles that account.

Q Do you know where Mr. Edwards lives?

A I am not sure, but I think Mr. Edwards lives at Eau Claire, or nearby.

Q What other salesmen do you recall worked for Freeman in 1966?

A Well, we had a half a dozen other country salesmen whose names do not come to my mind now.

Q You have six country salesmen. Could you give me—

A I do not know that it was six. I think we had eighteen to twenty people all told in our Sales Department.

Q You have testified that Mr. Edwards handled some of your Wisconsin accounts.

A Yes.

Q Can you give us generally some of the areas covered by some of your other country salesmen?

A We have a man in central Illinois, [283] traveling that territory, Frank Keller. We operate a retail yard in Springfield and he runs the retail yard and he handles the Wholesale business in that territory.

* * * *

[299] Q Is it a fact that United Electric's [300] largest customer was, by far, the Commonwealth Edison Company, in 1965?

A Yes, sir.

Q Who was Freeman's largest customer in 1965?

A The Commonwealth Edison Company.

Q Having reference to Nugent Deposition Exhibit 45-B, could you tell us how many tons of coal Freeman sold to Commonwealth Edison Company in 1965?

A 1,540,320 tons.

Q Was Commonwealth Edison Company the largest customer of Freeman in 1965?

A Yes, I think it was.

Q In 1965, who was the second largest customer of Freeman?

A The Tennesse Valley Authority.

Q Now, Mr. Nugent, I ask you to look at Nugent Deposition Exhibit 44 and tell us how many tons of coal were sold by United Electric in 1965 to the Union Electric Company.

A In 1965 the Union Electric Company purchased 485,870 tons from the United Electric Coal Companies.

* * * *

[304] MR. CUSACK: On the record.

BY MR. CUSACK:

Q Mr. Nugent, at what point in time did the salesmen of Freeman and the salesmen of United Electric stop soliciting common customers?

MR. HEDLUND: May I have the question read, please.

Q (Read by the Reporter.)

MR. HEDLUND: When did you stop beating your wife?

MR. CUSACK: If they did.

MR. HEDLUND: Ask a proper question.

BY MR. CUSACK:

Q Mr. Nugent, do you know whether or not the salesmen of Freeman and the salesmen of United Electric solicited the same customers?

A The salesmen for Freeman and the salesmen for United Electric are continuing to solicit the same customers.

Q Have they solicited prior to the merger?

A Yes.

Q These are common customers?

A In the case of the Union Electric Company, [305] Mr. Davis still handles the shipments of Freeman coal to Union Electric and Mr. Croak still handles the shipments of United Electric.

In the case of the Commonwealth Edison Company, Mr. Tucker and Mr. Gebhart continue to handle the business of the Comonwealth Edison Company, and Mr. Butler and—I think he gets some help from somebody else, perhaps Hamson, still handle the United Electric Company.

Q Now, Mr. Nugent, you testified yesterday with regard to the opening of the Orient No. 6 mine of Freeman. Where, sir, is that located generally?

A Orient No. 6 is due east of Orient No. 3.

Q Would that be located in the DuQuoin Freight Rate District?

A Right here (indicating).

MR. CUSACK: Let the record show that the Orient No. 6 mine is located slightly to the west of the Chicago

Eastern Illinois Railroad, which is to the east of the Orient No. 3 mine.

* * * *

[332] MR. HEDLUND: We will so stipulate. I am not certain that 4064 is a page number, but perhaps it is. It certainly is some sort of numbering of these minutes. I will stipulate that these are minutes from the meeting held on October 28, 1960, by the Board of Directors of The United Electric Coal Companies.

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q Mr. Nugent, does this refresh your recollection in regard to the approximate date when these merger discussions were going on?

A Well, this seems to me to have to do with the purchase of a 1650-B shovel.

Q I direct your attention, Mr. Nugent, to the middle of the page.

A Oh, yes. Yes, I recall that.

Q Do you recall what company was involved, sir?

A The Truax-Traer Coal Company.

Q It states in paragraph three of Nugent Deposition Exhibit 49:

[333] "The Chairman stated because of conversations in the past in regard to possible consolidation with another coal company in this area, it might be well to give some consideration to the subject."

Mr. Nugent, who was the chairman referred to in Nugent Deposition Exhibit 49?

A I believe at that time it was Kolbe.

Q Frank F. Kolbe?

A Yes. I am not too sure about that, but I think Kolbe was there then.

Q Do you know any reason why Messrs. Falkoff, Morris and yourself did not vote on this resolution?

MR. HEDLUND: To which resolution are you referring?

MR. CUSACK: I am referring to the resolution on the bottom part of the page which reads:

"Resolved that a committee composed of Messrs. Nugent, as chairman, Falkoff and Morris be and hereby are appointed to serve at the pleasure of this Board to investigate and report to this Board concerning such consolidation."

[334] BY THE WITNESS:

A I presume it must have been a degree of modesty. Perhaps we did not want to vote for ourselves on the committee.

MR. CUSACK: Thank you.

BY THE WITNESS:

A I must say, however, that I am not that modest.

BY MR. CUSACK:

Q What happened, Mr. Nugent, in regard to these discussions with Truax?

A I spent a great deal of time on that with Harold Truax and we employed the Paul Weir Company to make an evaluation of both properties.

They got a report from Weir and we got a separate report. We reached a basis of exchange of 1.45 shares of Truax-Traer stock for each share of United Electric stock. That was on the basis of the Weir appraisal and the Truax-Traer people just would not accept it.

Q United Electric was to be the surviving company?

A United Electric was to be the surviving company.

[335] Q Was it contemplated that the management of United Electric would be in charge of the company after its acquisition by Truax?

A Yes, it was.

Q So this was really a discussion of United Electric acquiring Truax, was it not?

A It was a discussion of United Electric acquiring Truax, but I believe it was initiated by Harold Truax.

Q He came to you to essentially sell his company?

A Exactly.

Q Were these discussions had with the knowledge of Colonel Crown of Material Service?

A Yes, sir.

Q And with his concurrence?

A Yes, sir.

Q Were these discussions had with the concurrence of the General Dynamics people in New York?

A Well, these discussions had taken place prior to this time, perhaps two or three years prior to this time, and I do not recall the reason for these minutes, because I believe it failed at just about this time.

* * * *

[336] Q You were in charge of the discussions?

[337] A (Nodding head "Yes".)

Q Your answer is "Yes"?

A Yes.

Q Mr. Nugent, you went on the Board of United Electric in October, 1959, did you not?

A I think that is right.

[338] Q And you did not start discussing the acquisition of Truax by United Electric until you went on the board of United Electric, did you?

A I may have had some informal discussions with Harold Truax prior to that time.

Q Thank you.

Did Mr. Kolbe, incidentally, disapprove of the acquisition of Truax by United?

A On the contrary, he was most anxious.

Q Do you know why?

A Well, Mr. Kolbe was a substantial holder of United Electric stock.

Q Thank you.

A I think he owned 25,000 shares.

Q Mr. Nugent, do you recall the acquisition by United Electric of some coal reserves in an area in McDonough and Schuyler Counties, Illinois, referred to by the United Electric as the Industry Field?

A Yes.

Q Do you know, sir, when United Electric began acquiring coal reserves in the Industry Field?

[339] A Quite sometime back.

Q Could you give us an approximation?

A When I first became interested in United Electric, I thought it was an unwise investment, and it was dis-

cussed at the board meetings right after I went on the board.

Now, I think at that time that there was something like $800,000 in land, money invested in land, so I would assume that it must have taken a good many years to acquire that much land.

Q So when you got on the board of United Electric, which was in the fall of 1959, up to that time United Electric had spent about $800,000 to acquire reserves at the Industry Field—

A Yes.

Q —is that correct, sir?

A Yes.

Q Could you give us some general idea where the Industry Field is located in reference to the Fulton-Peoria District?

A Industry Field is south of the Buckheart—Cuba properties, quite a distance there. It is [340] quite a distance from the river.

It is eight miles away from the Burlington Railroad. The thought was that it would go to the river, where, as a matter of fact, United Electric could take coal out of the Belleville District, move it to the river, and bear in mind that the Belleville operators, through the Kellogg dock, have a 45 cent rate to the river, so it can move to the river for 45 cents and up the river a barge rate could have been negotiated for less than the published rate, but on the published rate the coal could be set down at a point where Industry would be loaded on the river for considerably less money than it could be produced and transported to the river from the Industry Field.

Q Is the Industry Field—

MR. EISEN: You did not mean to say "Industry" there, did you, sir? You mean, it could have been loaded easier from—

BY THE WITNESS:

Q From the Belleville District, transported to the river on the 45 cent rate and then up the river and to a point on the river near the [341] Industry Field, a logical point for loading, and you could do that for less money

than you could deliver the coal from the Industry Field to the river.

BY MR. CUSACK:

Q Has United Electric continued to hold coal reserves at the Industry Field?

A Yes. As of that date the policy was to continue to acquire coal in the Industry Field as it became available, but at farm prices, and we did require some additional acreage at farm prices and we are farming it.

Q That is, after 1959, when you went on the board of United Electric?

A Yes.

Q Your answer is "Yes"?

A Yes, sir.

Q Prior to that time United Electric had made acquisitions of land and reserves at the Industry Field at over farm prices?

A Yes, sir.

Q Would you please explain the difference?

A I think that is not a particularly productive farming area and land was available at [342] about $125 per acre.

With coal land such as that, of course, if it were better located and with an overburden not nearly so high—I think the ratio there is 30 or 35 to 1—it might be different, but this was a most uneconomical proposition and a most unwise investment.

Q Whose idea was it to acquire the Industry Field?

A I am afraid that I cannot identify anybody particularly in the management of United Electric who was responsible for it, but I believe the minutes will indicate what my position was.

Q Did Mr. Kolbe agree to United Electric acquiring coal reserves at the Industry Field?

A I think that Mr. Kolbe, of course, was in charge of the management and I am sure that he approved of the purchase.

Q Mr. Nugent, if the Industry Field is, in your opinion, a very unwise investment and has been a very unwise investment for United Electric, why, since the time

you have been on the board of United Electric, has the board of [343] United Electric continued to pick up reserves at the Industry Field at farm prices?

A At farm prices we can make some money farming it. We are grazing cattle on it.

Q You do not have any plans, then, to ever mine this coal?

A I do not believe that the Industry Field will be mined until such a time as all of the commercially mineable coal in Fulton County is exhausted.

Q And when will this happen, do you know?

A United will be out of there in another ten or twelve years and Truax will not be far behind.

They have perhaps enough acreage for a mine in the North Canton field, but they have already abandoned the Little Sister property, and they have one property left. Their production in the field has been reduced.

Banner will be through in another half a dozen years or so, so the field is going out of business pretty rapidly. One day perhaps coal can be mined and it can be sold. There are only twelve million tons of reserves there, so—

[344] Q Excuse me. Sold from Industry, you mean?

A Sold from Industry, but it will present a problem in that there are only twelve million tons of reserves, and it is not enough to justify moving in and building a washing plant, so we would have to find a customer that will buy raw coal.

Q Does the Industry Field have No. 2 coal, sir?

A It is No. 2 coal of good quality.

Q That is the same coal as at the Banner mine?

A Yes.

Q What does the BTU on an unwashed basis run for the Industry Field?

A It will run on the high side, and I do not think we have sufficient drill holes to give you a proper answer on that.

Q Can you give me an approximate answer?

A It might be 10,000 BTU on the raw side.

Q And on the washed side what would it run?

A About 12,000.

[345] Q What is the sulphur content, do you know?

A The sulphur will be high.

Q Are there any mines in the Industry Field area or near the Industry Field area now in operation?

A Republic Coal & Coke or Ayshire Collieries, the operating company, has the Sun Spot mine closer to the river.

Q How far away from Industry?

A It is a considerable distance away from Industry, and it is on the Burlington Railroad. The overburden ratio I do not think is high, and they have a larger deposit of coal.

Q Do you know how much of a deposit?

A No, I do not, not exactly.

Q Assuming that United Electric wanted to pay a little bit more money than farm prices for expansion of the Industry Field, could it acquire further reserves at the Industry Field?

A Not of any consequence.

Q That is the—

A That is about all there is there.

Q That is the extent of the field?

[346] A That's about the extent of the field.

Q Has it been drilled sufficiently to make that determination?

A Yes, sir, it has.

Q You said that in order to operate the Industry Field, it would have to be raw coal, that is, unwashed coal?

A Yes, sir.

Q Who buys unwashed coal in Illinois?

A The utilities could use it.

Q Don't they buy most of the coal in Illinois?

A Well, I think at a time when the Buckheart, Cuba and Banner mines are gone, anything that can be mined nearby perhaps can be sold.

Q Would this include the Industry Field?

A Yes. This would be probably twenty years from now, a rather poor investment, $800,000, carrying it for thirty years before you utilize it.

Q Do you have any idea how much United Electric has spent on Industry Field since 1959, when you went on the board?

A Not very much, because there was not [347] much available.

• • • •

[361] BY MR. CUSACK:

Q Mr. Nugent, who are the competitors of the Freeman Coal Mining Corporation?

MR. HEDLUND: I think you should also, in that connection, start talking about for which customers where. If Mr. Nugent is able to answer that question, however, he may do so.

BY THE WITNESS:

A The competitors of the Freeman Coal Mining Corporation on southern Illinois coal are those producers in southern Illinois, western Kentucky and Indiana, and to a degree producers in the Belleville District.

Competitors of Freeman in central Illinois are producers in central Illinois and Fulton County, and to a limited extent coals from other fields that can reach Edison's market.

MR. CUSACK: Thank you.

• • • •

[373] Q Mr. Nugent, when was substantial strip mining first undertaken in Illinois?

A Oh, way back. Prior to 1900, I think. I presume that is what you are talking about, when you say "substantial"—well, I just do not know what you mean by that, but let's say that coal was stripped in the early part of the century.

Q In the early 1920's Mr. Nugent, when you first became active in the coal business, was there substantial strip mining being conducted in Illinois?

A The strip mine tonnage was then, of course, percentagewise far less than it is today, of the total production in the state.

Q In the early 1920's would the strip production in the State of Illinois be about 10 percent of the total production?

A I would not guess as to the percentage.

Q It is now over half, is it not?

A Yes, sir, it is.

Q Directing your attention to the 1920's, when you first became active in the coal business, what was the maximum depth to which a strip mine could strip coal?

A Around 20 to 25 feet.

[374] Q That is the furthest down they could go?

A (Nodding head "Yes.")

Q "Yes"?

A Yes, sir.

Q At the present time what is the maximum depth which a strip company can go down to mine coal?

A I would say that perhaps 125 feet would be the outside figure, and location would determine as to whether or not that could be profitable. It would be most costly. Anything over 80 feet begins to become costly.

Q What are the reasons, Mr. Nugent, if you know, why the depth to which the strip companies have been able to go has increased over the years?

A Well, as the shovels have gotten bigger, we have been able to handle more overburden, but it has its limitations in that you have to maintain a spoil bank and the angle of repose needs to be such that you can maintain a pit of adequate width for loading coal.

Q Although I know what you mean by your statements, Mr. Nugent, I think it might be helpful for the record if you will just explain that a little [375] bit further.

A I think perhaps it is simpler to say that no matter how big the shovel is, how many yards you take, it is the distance that you can throw it or cast it that is important.

Q Because of the spoil bank?

A The spoil bank will roll in on you.

Q On the pit where the mining equipment is located?

A Where you are digging the coal.

Q Is it a fact that 20 years ago a 70 yard cubic bucket size on a shovel was unheard of?

A I think that is true. I do not think there was such a thing 20 years ago.

Q What are the sizes of the buckets on the shovels now, sir, do you know?

A Well, I was just trying to think. I think 180 yards. I think there is one shovel of 180 yards, although I am not sure.

Q Mr. Nugent, what are the projections or predictions by knowledgeable people in the coal industry in regard to the depth that you will be able to strip in the next ten years?

A I think we have reached our maximum now. [376] First, with reference to the coal that is available to strip, I think the Belleville district has gone about as far as they can. There is only one virgin piece of land left there and that is the Denmark acreage.

All the rest of the strip land in the State of Illinois is under development so that the equipment necessary to mine that coal is already in place.

Now, the Denmark acreage is not a high overburden coal, so I would see no need for placing a larger shovel in the State of Illinois, because the acreage is not available.

Q Who owns the Denmark acreage, sir?

A Ayrshire Collieries.

Q Do they contemplate mining it, do you know?

A I presume some day.

Q Is it your opinion then, sir, that in fact Illinois is running out of strip reserves?

A I am positive that in the State of Illinois, to repeat, every piece of coal that will be mined by the stripping method is now in the process of development but one, and again that is Denmark.

Q Would this include the Industry Field?

[377] A I do not consider Industry Field at this time commercially mineable.

Q It has been estimated, Mr. Nugent, that there are twenty-two billion tons of strip reserves located in the State of Illinois and that these strip reserves are recoverable.

A Yes, sir.

Q Do you agree with that figure?

A I do not think I have heard that figure before, and I do not know where it came from. If I knew the author, I would know whether I could accept it or not.

MR. CUSACK: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. CUSACK: On the record.

BY MR. CUSACK:

Q Mr. Nugent, we have handed to you and to your counsel a booklet entitled, "Stripping-Coal Resources of the United States, Geological Survey Bulletin 1252-C," by Paul Averitt, printed by the United States Government Printing Office, Washington, 1968.

[378] A Yes.

Q I direct your attention to page C7 in regard to Illinois, which states in pertinent part:

> "On the basis of work completed and in progress, J. A. Simon (written commun., Sept. 28, 1966) has concluded that the remaining stripping-coal resources of Illinois as of January 1, 1966, in beds 18 inches or more thick and at a maximum depth of 150 feet, totaled 21,223 million tons. Simon also concluded that the original resources within the same parameters totaled about 23,000 million tons."

I ask you on the basis of this statement, Mr. Nugent, whether you agree with the estimate of, according to this document, Mr. Simon in regard to the stripping-coal reserves of Illinois?

A I believe I wrote Mr. Simon a letter sometime back, asking him to give me his views on commercial strip coal available in the State.

I think at the same time we sought the view of Paul Weir, a very competent man in this field, and I think that the views of Mr. Simon and Mr. Weir are not in conformity with the views as [379] stated here, and particularly the tonnage that is involved.

* * * *

[388] Q Did you discuss with Mr. Mullins the [389] coal reserves situation in Illinois?

A No, sir.

Q In other words, your conversation with both Mr. Mullins and Mr. Kelce was just general discussions which would have no bearing on the issues of this lawsuit?

A That is right.

Q In regard to your conversation with Jack Simon of the Illinois State Geological Survey, Mr. Nugent, what did Mr. Simon tell you in regard to the availability of strip reserves in Illinois?

A I called Jack Simon's attention to the map, and I think in about the same manner—

Q Just a moment, please, sir.

A Yes.

Q You are referring to Nugent Deposition Exhibit 38?

A Yes.

Q The map of shipping coal mines in Illinois?

A Yes.

Q All right.

A I called Jack Simon's attention to the [390] map I think in about the same maner that Paul Weir called his attention to the map when he was a speaker at an Illinois Mining Institute in Springfield, when he publicly indicated to Dr. Simon that the map was most confusing and that a much better job could have been done on it.

We talked about the confusion that has arisen because of the inadequacy of the map, the fact that he has shown huge reserves of strip coal that are in fact not there, the fact that he shows as strippable coal, coal that is under towns and communities and buildings and so forth, where obviously it could not be stripped, and Dr. Simon's answer to that is that the map was intended to be just general in nature and used for exploratory work, and was never intended to indicate the coal that was commercially mineable in the state.

Q Thank you.

In regard to your conversation with Paul Weir, what did Mr. Weir say to you?

A Mr. Weir and I jointly deplored the fact that such a map had been made, and that certainly it does nothing but create confusion [391] and adds nothing to the benefit of the industry.

Q Are you upset, Mr. Nugent, over Mr. Simon's map, which is Nugent Deposition Exhibit 38—

A No.

Q (Continuing)—or are you upset in regard to his estimates of strippable coal reserves?

A We are upset—I do not know that that is the word. I am not upset with Dr. Simon. The map has been in existence for some time, and I do not know that he is entirely responsible for it.

Confusion has arisen about the use of it by people who are not knowledgeable in the business, and I must include you in the Justice Department in that group.

Q I appreciate your comments.

A Well, I am a coal man and you are a lawyer, and I think maybe I would do better in the coal business than you would do, and you would do better in the law business than I would.

Q Thank you.

[392] Did you talk to Mr. Buchanan of Old Ben Coal Corporation in regard to the strip reserve situation in Illinois?

A No. Mr. Buchanan is not knowledgeable in that area.

Q What did you talk to Mr. Buchanan about?

A Mr. Buchanan and I have been very close friends for a great many years. We play golf together and we go to lunch together, and it is a long-standing relationship, ever since he has been in the coal business.

Q You are a close friend of Tom Mullins' too, are you not?

A I have known Tom Mullins for a great many years, and I have known Merl Kelce for a great many years.

Merl Kelce and Tom Mullins and I have had lunch together and exchanged views, we have labor problems and other problems, and we have much in common.

Q With whom did you speak at Ayrshire Collieries in connection with this lawsuit?

A I have talked to Norman Kelb. I [393] think Norman Kelb is the only one I have talked to at Ayrshire Collieries.

Q Did Mr. Kelb express an opinion to you in regard to the availability of strip reserves in Illinois?

A Let me answer that in this way, Mr. Cusack, and maybe it will save some time: The people who are in the business, knowledgeable, as I said before, such as Mr. Kelce, Mr. Mullins and Norman Kelb, are thoroughly familiar with the strip acreage that is available in this state, and there is not any necessity for any conversation between me and people in the business as to whether there are strip reserves available. The question is not debatable, we know that they are not there, so there just isn't anything to discuss.

That goes down to cub engineers who have just been in the business a couple of years. There is not a utility man in the state buying coal, a knowledgeable utility man, who does not know that the strip reserves are not available.

[394] There is not a salesman selling shovels and equipment who does not know that the reserves are not available. They have a keen interest in it. The Caterpillar Tractor Company are knowledgeable in that area. They know the reserves are not available. Their sales programs are directed elsewhere because the reserves are not here.

This is not a question that is debatable among coal people. It is an accepted fact that reserves are not here.

Q The Humble Oil Company, though, you testified, was able to buy some substantial reserves in Illinois, is that correct?

A Underground coal.

Q There are substantial amounts of underground coal available in Illinois?

A Substantial reserves or acreages of underground coal, we understand, have been acquired by people associated with the Humble Oil Company.

The reserves that they have acquired in most cases were reserves that were rejected by commercial operators.

* * * *

[396] Q Would you consider, Mr. Nugent, the Round Prairie Field of United Electric to be an adequate area of underground coal reserves, an adequate deposit of underground coal reserves?

A The Round Prairie Field is an adequate reserve of underground coal that can be commercially mineable and at a time when it is not necessary for that field to compete with the lower cost strip coal that can be produced in the same area, such as Fidelity and River King and so forth.

Now, it would be unreasonable to expect that you could go underground and mine coal in the Belleville District in an area where there is a massive limestone structure on top of the coal, where the full extraction system cannot be used, and where you can only expect to get 50 to 55 per cent of the seam, and compete with mines in southern Illinois where the full extraction system is usable and where you can recover 93 to 95 per cent of the coal, and of course, at a lower cost and with a better [397] quality.

Q When do you expect that the Round Prairie field will be comercially mineable?

A As I said before, there is only one deposit of virgin coal in the Belleville field, and that is the Denmark acreage.

In time the strip mines such as Fidelity will be exhausted and other mines will be exhausted and then it will be possible to develop the Round Prairie field.

Q When do you expect this to take place?

A Well, as you know, Fidelity will go out of the picture in ten to twelve years. Some of the other mines will go out at about the same time.

Q Some of the other mines in the Belleville District?

A Yes.

Q The strip mines?

A Yes. I do not know what the life is of River King, but River King is digging a lot of coal and you know they can't go on forever.

Q River King is operated by Peabody, is it not?

[398] A Yes, sir.

Q Do you expect, then, that as the strip reserves acreage in the Belleville District is exhausted, that the

operators in the Belleville District will open up underground mines in the Belleville District?

A Only those that own acreage, such as the Peabody Coal Company in the Belleville District.

The next mine that Peabody opens in the Belleville District will probably be an underground mine.

Q But United Electric has underground acreage in the Belleville District.

A Yes, but unfortunately it is not located on the Kaskaskia River, as is the acreage that belongs to the Peabody Coal Company.

Q But it is located close to rail transportation, is it not?

A That is not sufficient to compete. As you well know, the Kaskaskia River is being canalized, and the only companies that own land on the Kaskaskia River are the Peabody Coal Company and the Kaiser people, Kaiser Aluminum [399] Company.

Virtually all of the acreage belongs to those two companies. I think, since you are acquainted with the Peabody Coal Company situation, you know they have entered into an arrangement for a mine-mouth plant with the Illinois Power Company at a point near Baldwin, Illinois, for underground coal.

Now, if they can put that coal into the river, with no transportation cost to the river, and the other Belleville operators have a transportation cost to the river of 45 cents, if they can put it into the river at virtually no cost, then they can compete, since they have an edge of 45 cents.

Q What about the Big Muddy Creek situation, insofar as Beaucoup field is concerned?

A Big Muddy and Beau Coup Creek does not have any money allotted to it and it is not likely that it will be developed, and if it is developed, and by the time it is developed, it will have no value to the Fidelity mine. It will be exhausted by then.

Q Assuming that the Beaucoup Creek is [400] canalized in the next twenty years, would this increase the attractiveness of the Beaucoup field and the Round Prairie field?

A It could have some benefit.

Q Would it have a substantial benefit, do you think?

A No. I am not quite sure how close Beaucoup Creek comes to the Round Prairie field. I do not believe it is very close to it.

MR. CUSACK: Will counsel stipulate that Beaucoup Creek runs immediately to the west of the Round Prairie field?

MR. HEDLUND: Not at this time.

MR. KEMPF: May we go off the record for a moment?

MR. CUSACK: Yes.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. CUSACK: On the record.

BY MR. CUSACK:

Q Is it not a fact, Mr. Nugent, that the Round Prairie field is located between Beaucoup Creek and Little Beaucoup Creek in [401] Perry and Washington County, Illinois?

A It is very close to it, but I have no knowledge as to how far it is intended that Beaucoup Creek be canalized. [402] Q I see.

A I do not think the original plan provided for going up that far. But, Mr. Cusack, Beaucoup Creek and Big Muddy is a pipe dream.

Q It has not been funded, in other words?

A No.

Q Mr. Nugent, do you expect the demand for bituminous coal to increase over the next ten or fifteen years?

A That is very difficult to say. We have some very serious competition from nuclear power.

Q Would you characterize the market for coal, for the production and sale of coal in Illinois and in the Midwest, as a sellers' market?

A No. I wouldn't think so.

Q Is it a fact that Freeman can sell every ton of coal it mines?

A It is a fact that Freeman does sell every ton of coal that it mines, but Freeman does not make an adequate return on its invested capital.

* * * *

[411] Q Is it a fact, though, that for example, the 1967 annual report of the state of Illinois Department of Mines and Minerals does present accurately the production of coal in Illinois by the various mines operating in Illinois?

A Yes, it does, since we are required by the State Mining Act to report to that department accurately the number of tons of coal we produce each year.

Q Is it your opinion that these reports are accurate in regard to the production of coal?

A Yes, it is.

Q By the various companies operating in Illinois?

A Yes, sir.

Q Mr. Nugent, is it your position that The United Electric Coal Companies was derelict in acquiring sufficient strip coal reserves?

A I do not know that I would use the word "derelict", but I believe that they were not aware of the seriousness of their situation until it was much too late.

Q Is it your testimony that after you became a member of the board of United Electric, [412] you made conserted efforts to acquire sufficient strip reserves?

A Yes, it is.

Q And did you do this?

A Will you restate that again? I do not know that my answer fits the question.

MR. CUSACK: Read it, please Mr. Youker.

(The record was thereupon read by the Reporter as above recorded.)

THE WITNESS: All right.

BY MR. CUSACK:

Q Mr. Nugent, is it your opinion that Mr. Kolbe did not foresee the need to acquire sufficient strip coal reserves?

A I do not want to seem to be critical or unkind to Mr. Kolbe, he is a very fine person, and I do not know that I would charge Mr. Kolbe with that responsibility.

I think that his Operating Department and people who are knowledgeable in that area should have been aware

of the situation, and I would be more inclined to criticize them than I would to criticize Mr. Kolbe.

[413] Q What are the names of these operating people, sir?

A Going way back, he had some very competent people. He had a fellow named Hepburn.

Q Mr. Hepburn is now dead, is he not?

A He is dead.

Q All right.

A Prior to that he had a man named Morrison, and he had a very able man prior to Morrison, who is now dead, and his name slips my mind.

Q Was Mr. Morrison an able man, in your opinion?

A I did not know him well enough to make a judgment. He came in here from Canada and he was not knowledgeable in the area.

Q Was Mr. Hepburn, in your opinion, an able man?

A He was, but at the time he headed the Operating Department, it was then much too late.

Q What about Mr. Morris?

MR. HEDLUND: "Morris", did you say—

THE WITNESS: Morrison?

MR. HEDLUND: —or "Morrison"?

[414] MR. CUSACK: Mr. Morris.

BY THE WITNESS:

A Mr. Morris was vice-president in charge of sales, and I think that he was greatly concerned over a great many years about the inadequacy of the strip reserves, as were many other people associated with The United Electric Coal Companies.

Their sales department could not help but have their attention called to the inadequacy of reserves by the utility people upon whom they were calling.

BY MR. CUSACK:

Q Mr. Nugent, when you went on the board of United Electric, which you testified was in the fall of 1959, did you realize then that in your opinion United Electric had insufficient coal reserves?

A From the time I attended the first board meeting, I do not believe that I failed to bring that subject up at any board meeting that I attended.

Q So your answer to my question is "Yes", then?

[415] A Yes, sir.

Q And this was a matter that seriously concerned you?

A Yes, sir.

Q In the light of the total operations of United Electric, how serious, Mr. Nugent, did you think the problem was in 1959 and in 1960?

A Without strip reserves, the company obviously was in liquidation.

Q Why then, Mr. Nugent, did your employers continue to make substantial acquisitions of stock in United Electric?

A Because we had underground reserves available so that United Electric could enter into a long term contract with a supplier to run out the reserves that they had.

Without the underground reserves to back them up, they are in no position to mine coal on the last day that those reserves are available, and those people who are buying coal from United are not going to wait until the end of United's reserves to make arrangements for their fuel supply.

Q Is it not a fact, Mr. Nugent, that [416] Material Service Corporation and its successor in interest with regard to United Electric, General Dynamics Corporation, continued to acquire substantial amounts of stock in United Electric?

A Yes, sir.

Q In fact, in 1966 it purchased 100 per cent of the outstanding stock of United Electric, is that not correct, sir?

A Yes, sir.

Q And this was done even in the light of your fears in regard to United Electric's strip coal reserve position, is that correct?

A Yes, sir.

Q Did you ever advise General Dynamics or Material Service not to acquire any more stock in United Electric?

A No, sir, for the very reason that we acquired the first shares of stock, because we realized that The United Electric Coal Companies was a coal company in the process of liquidation and that they had to be identified with somebody that had underground reserves that could be made available to them so that they could remain a [417] viable entity in the market.

Q Are you saying that Material Service Corporation and General Dynamics Corporation bought stock in United Electric as a method of helping United Electric survive?

A Yes, sir.

Q Is it not a fact that General Dynamics Corporation and Material Service Corporation purchased stock in United Electric because they considered it an excellent investment?

A I would not say that, no.

Q Do you remember—

A When—

MR. HEDLUND: The question has been asked and answered.

THE WITNESS: What?

MR. HEDLUND: The question has been asked and answered.

MR. CUSACK: If you would like to continue, it is perfectly all right with me.

THE WITNESS: Go ahead.

BY MR. CUSACK:

Q Do you consider, Mr. Nugent, the purchases of stock by Material Service Corporation [418] and General Dynamics Corporation in United Electric to have been a good investment?

A Yes.

Q It has been, has it not, an excellent investment?

A Yes, sir.

Q Is it not a fact, Mr. Nugent, that at the time in 1966 when General Dynamics acquired all of the shares

of United Electric, United Electric had over $6,000,000 on its treasury which was transferred to General Dynamics?

A Yes, sir.

Q Is it a fair statement to say that United Electric, at the time of the acquisition by General Dynamics, was a very liquid company?

A Yes, sir.

Q And also a very highly profitable one?

A Yes, sir.

Q You testified that General Dynamics expected to help United Electric in regard to underground reserves. Do you mean that General Dynamics expected to supply United Electric with underground reserves?

* * * *

[420] Q Thank you.

Mr. Nugent, did United Electric have a budget for the acquisition of coal reserves?

A You say, "did United." When do you mean?

Q At the time you became a director in 1959.

A No, sir, they did not.

Q Was a budget instituted after you became a director?

A Yes, sir.

Q How much was budgeted, can you tell us, in 1960, for example, for the acquisition of coal reserves at United Electric?

A I do not believe we set any sum aside, but it was made clear to the management that all of the money necessary would be made available for the acquisition of reserves.

Q At the present time, Mr. Nugent, will General Dynamics make available to United Electric all funds necessary for the acquisition of strip coal reserves?

[421] A Commercially mineable strip coal reserves, yes.

Q Wherever located?

A Wherever located.

Q Including in the state of Colorado?

A Including the state of Colorado or anywhere else where it can be mined commercially.

Q In the last twelve months has United Electric acquired any substantial coal reserves in Colorado?

A No, sir.

Q Arizona?

A No.

Q Utah?

A No.

Q New Mexico?

A No, sir.

Q When you speak of commercially mineable coal, Mr. Nugent, are you speaking about commercially mineable coal at the present time or ten years from now?

A Either now or ten years from now. By commercially mineable, we mean coal that we can mine and make a profit.

[422] Q Either now or in the foreseeable future?

A Yes, sir.

MR. CUSACK: I suggest that we take a few minutes' recess, gentlemen.

MR. HEDLUND: All right.

(Whereupon a short recess was taken, after which the taking of the deposition was resumed as follows:)

MR. CUSACK: On the record.

BY MR. CUSACK:

Q Mr. Nugent, do you know of any coal producers in Illinois who were previously strip miners that now operate an underground mine?

MR. HEDLUND: I believe that question was asked on interrogatories and answered, was it not, Mr. Cusack?

MR. CUSACK: I do not recall specifically.

MR. HEDLUND: Let's check.

MR. CUSACK: I would still like to ask him if he knows of his own knowledge.

MR. HEDLUND: Let's see if in fact that question was not asked and if in fact Mr. Nugent answered it.

• • • •

[424] Q Yes, sir.

A I do not know of any strip operator that has opened up a shaft or a slope mine in the state of Illinois.

Q What about Truax-Traer, Mr. Nugent?

A Well, they have been in underground mining for many, many years.

Q In Illinois?

A In Illinois. Their Burning Star mine has been in existence for a long period of time.

Q Where is Burning Star located?

A It is out of business now. It was down in the Belleville District. They worked it out, so it is that old.

Q Are there a number of companies that operate underground—

A Let me say, too, about the Truax-Traer Coal Company, at the time that the Truax-Traer Coal Company was stripping in Illinois, they were operating underground mines in the Dorothy field in West Virginia. They were very competent in the underground area.

• • • •

[431] Q Based on your knowledge, Mr. Nugent, of the financial condition of United Electric, would United Electric be able to borrow money to open up an underground mine?

A I think they would have considerable difficulty, because first they certainly would not open up an underground mine unless they had the coal sold before they opened the property, and it would be difficult for me to believe that a utility company or any other large buyer of coal would be willing to enter into a contract with a company with no experience in that field and one without a staff, when coal is available and underground mines can be opened up by producers that are in the business and competently staffed and with adequate capital and reserves.

• • • •

[436] Q Mr. Nugent, you have testified as to your concerted efforts, once you became a member of the board of directors of United Electric, to obtain additional coal reserves for United Electric.

A Yes.

Q Were those efforts successful in obtaining any new field of strip coal reserves?

A No, sir. Did you say, in Illinois?

Q No. I did not. I did not qualify it.

A Well, we did acquire some strip reserves at Hayden, Colorado, in the early 1960's.

MR. CUSACK: Is that Hayden County, Colorado?

BY THE WITNESS:

A No; the town of Hayden, Colorado.

MR. CUSACK: That is Routt County, is it not?

BY THE WITNESS:

A Yes.

• • • •

[16]

EXCERPTS FROM DEPOSITION OF NICHOLAS T. CAMICIA, TAKEN SEPTEMBER 17, 1968

• • • •

Q Going west from the east coast along the Appalachian range roughly, just west of the Appalachian range, there is a long strip indicating coal producing area there, is that right?

A Yes.

Q How is that designated in the industry, if you know?

A There are several designations.

Q Various districts, is that it?

A Yes; various coal districts. The southern part of Virginia and western part of Virginia, that particular area is called the Pocahontas Field.

That is where all of the Pocahontas low volatile metallurgical coals are found in the United States.

Q Is there a general description for that like the Eastern Province?

A It is called the Appalachian Field.

Q The Appalachian Field?

A Yes. That includes all the way from Pennsylvania down into Alabama.

Q Going west from there, there is a [17] area covering about two-thirds of the State of Illinois and about the southwestern one-third of Indiana and a corner of Kentucky.

A Yes.

Q How is that designated in the industry?

A We call that the Midwest Field, in layman's language.

Q Then west of that, roughly spreading out maybe fifty to two hundred miles either side of the line along the borders of Nebraska, Iowa, Kansas and Missouri is another field, is there not?

A Yes.

Q What is that called?

A I do not know. It is not talked about very much in the industry because there is not very much coal mining there.

Q Is the Midwest Field also referred to as the Eastern Interior Coal Province?

A I have never heard that name.

* * * *

[31] Q You indicated that when you were at Island Creek, you had experience in operations, and I think you referred to the methods as drift, low seam and float, is that right?

A I referred to the types of mining that we had as drift, slope—

Q Was that "slope"?

A And shaft.

Q Was that "slope"?

A Yes.

Q Did you use the term "low seam"?

A We had low seam mining and middle seam and thick seam mining.

Q Yes.

A That refers to the height of the seam of coal we are mining.

Q Could you explain these terms briefly to us?

A Such as what? Which terms?

Q Well, "drift" was one of them.

A Well, a drift mine is a mine that—in West Virginia, principally, is where this type of mining is done. Because of the mountainous terrain the [32] seams outcrop or appear on the periphery of the mountain tops, and a drift mine is one where you just have to go directly into the mountain, as distinguished from a slope mine which is below the creek level or water level, and you must slope down to it, as distinguished from a shaft mine which is deeper down and it is not feasible to use a slope to get to it, you must go with a shaft because the slope does not lend itself to a seam that is lower down into the ground.

Q All of these could be classified or would be classified as underground mining methods?

A They are all underground mining, yes.

Q Would any of these methods be applicable to any of the Illinois coal?

A Well, two of them are, the slope mine and the shaft mine.

Q United Electric has a coal field designated as Round Prairie Field, does it not?

A Yes.

Q Would any of these methods be appropriate for the mining of Round Prairie Field?

A Yes. It would either be slope or shaft, and perhaps slope at that depth.

[33] Q At that depth, you are referring to an underground mine that is fairly shallow?

A Well, it is not shallow. It is at the point that a slope mine, which is cheaper to put in than a shaft mine, it is at that point in depth that you can utilize the slope rather than the shaft.

Q What savings can you effect by using slope rather than shaft?

A Well, the savings are in the construction of the slope as compared to the construction of a shaft.

It is easier and cheaper to sink a slope than it is to sink a shaft, and the equipment required to bring the coal out is much more expensive in a shaft operation than in a slope operation.

Q How do you bring it out of a slope mine as distinguished from a shaft mine? What kind of equipment do you use?

A In a slope mine you sink your slope at an angle at which a belt conveyor is able to traverse up the slope and bring the coal out, and that usually is limited to a seventeen degree slope.

In a shaft mine, of course, you must use [34] a big hoist and a head frame and skips to bring the coal out of the shaft.

Q What are the conditions that exist at Round Prairie which indicate to you that you could not possibly use this slope technique?

A The only indication is that it is 250 feet deep, and that would immediately, to any knowing mining man, indicate that the most economical way to reach that seam of coal would be by the slope means.

Q In terms of costs, or however you would like to express it, the cost per ton in removing coal or whatever you use in the business, how much of a saving can you effect by using slope in preference to shaft?

A Compared to shaft?
Q Yes.
MR. KEMPF: Does the witness understand that this is under identical conditions?
MR. EISEN: Yes.

BY THE WITNESS:

A I was going to stipulate that myself.
MR. EISEN: All right.

• • • •

[40] Q Have you made any studies or had any material prepared with a view to estimating the cost of putting in a slope mine at Round Prairie?

A We have not had any detailed engineering studies, no. I have looked at it myself [41] from a general standpoint, knowing the depth of the coal, the height of the coal and the bore hole readings, and I can pretty well determine about what the cost would be, and it would be similar to some of our southern Illinois mines.

Q There you are referring to the Freeman mines?
A Freeman, yes.
Q Would it be your testimony that the coal mined, if and when it was mined at Round Prairie, would compete with coal in the southern Illinois area?

A No, it would not compete with southern Illinois coal, because of the quality. That is one reason.

The second reason is that from our bore hole readings we know that this coal in the Round Prairie area has a roof condition that may not be surmountable.

Q What is that, sir?

A The limestone in the Round Prairie area comes right down against the coal, which precludes pillar mining, or room and pillar [42] mining, or full extraction of the seam. I could go into a long dissertation on that, but I do not think you would understand it.

Q We may have to do it, sir, if you can do it briefly. I think I may get back to that later, so you can be thinking about it. I will ask just one more question in that regard and we will get back to it later, because I am still just going over your experience.

With respect to a limestone roof, is it your testimony that that is a poor roof condition or a good roof condition?

A It depends on what you are talking about. A limestone roof is so solid that after you try to extract the coal from underneath the roof, it will not collapse or fall, and for that reason it throws the weight over on to your workings and causes what we call squeezes, which is where it pushes the bottom up into the workways that we have or the entries and the rooms we are trying to work, and it would cause considerable difficulty.

On the other hand, when you have a limestone roof, you can do partial mining and [43] do all right at it, but you are not extracting very much coal and the cost of development becomes prohibitive then.

You have good mining while you are developing, but you are spending a lot of money because of the belt you have to put in there to extend your workings, and then you are not recovering any of this pillar coal I am talking about. You spend all the money to get there and then you don't get anything for it.

Q Counsel will correct me if I am wrong, Mr. Camicia, but I think that Mr. Nugent indicated in his testimony, or estimated that there could be a 55 per cent, I believe he said, recovery—

A That is right.

Q —at Round Prairie.

A Which is very nominal. That is not good recovery. It is very poor recovery.

Q What is the percentage recovery at the Crown mine?

A The Crown mine is 55 per cent because it is under farm land. The recovery at Orient No. 3 is 95 per cent, the southern Illinois [44] mine.

* * * *

[46] Q I believe you testified that Island Creek Coal did not have any strip operations.

[47] A That is right.

Q You have just indicated now that you met Mr. Kolbe when UEC was stripping some coal for Island Creek.

A Yes. We had some property in eastern Kentucky that we thought might lend itself to what we call contour

mining in that part of the country. There is no such thing as strip mining.

Contour mining, as distinguished from strip mining, is mining around the top of a mountain in contour, around the mountain, and going back in to the seam until it is uneconomical to get any more.

Q Did you do any contour mining yourself, that is, Island Creek?

A No, we did not.

Q So I take it that you had this relationship with United Electric because of their particular know-how?

A Their know-how and the fact that they had the equipment and we did not want to invest that much money into an operation that we knew nothing about. We couldn't take that gamble.

Incidentally, our judgment was very [48] good on that because United Electric lost money on it, too.

• • • •

[52] Q Yes.

A From a personal standpoint, I thought it was a good thing that I would have the opportunity to be exposed to strip mining and learn something about it.

Q Was it good in the sense that it would give Freeman an advantage over being an exclusively underground operation, to also have strip mining operations?

MR. KEMPF: What kind of an advantage are you talking about?

THE WITNESS: Yes.

MR. EISEN: If he understands the question, I will ask him to answer it.

BY THE WITNESS:

A From an operating standpoint, I would say that there is a definite advantage.

• • • •

[77] Q What percentage of UEC's sales are to [78] accounts that Freeman also sells?

A I have no idea.

Q How about the reverse? Do you know what percentage of Freeman's sales are to accounts that UEC sells?

A No. I have no idea.

Q Mr. Camicia, I am going to suggest to you, in an effort to refresh your recollection, some of the common customers which, it has come to our attention, are served by both UEC and Freeman, to see if it accords with your knowledge.

With respect to Commonwealth Edison Company, our information is that 25 per cent of Freeman's sales are to Commonwealth Edison and 29.4 per cent of UEC's sales are to Commonwealth Edison Company.

MR. KEMPF: Would the reporter read back those figures, please.

(The record was thereupon read by the reporter as above recorded.)

BY THE WITNESS:

A I would think that is about right.

BY MR. EISEN:

Q With reference to the Tennessee Valley Authority, Freeman sells 15.2 per cent of its coal [79] to TVA and UEC 4.87 per cent to TVA.

A I do not know about that one at all. I do know that both of them sell some coal to TVA. I do not know the amounts.

Q Where is that coal delivered?

A I do not know that.

Q You have no knowledge whatsoever, or you do not know the specific place?

A I do not know the specific place. If I heard it, I might know it.

Q Is that delivered in Kentucky?

A Yes.

Q Shawnee, Kentucky?

A That is not the name. It is near there, though.

Q Near Shawnee?

A It is in the extreme western part of Kentucky, I know that.

Q And both—

A On the Ohio River.

Q That is a receiving point for both Freeman and UEC coal?

A Yes.

Q With reference to Illinois Power Company, [80] Freeman sells 4.5 per cent of its coal and United Electric sells 3.4 per cent.

A That sounds correct.

Q With respect to Union Electric Company, Freeman sells 4.1 per cent of its coal to Union Electric and UEC sells 9 per cent of its coal to Union Electric Company.

A Are you talking about 1967, or currently, or are you quoting—

Q I will fill in that date for you in one second.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY MR. EISEN:

Q The figures I have been referring to, Mr. Camicia, are the figures for 1965.

A 1965.

Q I believe you said that sounds about correct in each instance—

A Yes.

Q (Continuing) —so I assume that is approximately correct, the figures I have been quoting to you.

A Yes.

[81] Q If there are any changes as I read these off that do not correspond with 1966 or 1967, or even present sales, would you so indicate?

A Well, the only change I would suggest is that for Union Electric our current sales on an annual basis from Freeman are more like a million tons a year, which would be 12 per cent, or something, of our production.

Q Does UEC maintain at about 9 per cent?

A About the same, as I said, yes.

Q With respect to the Marquette Cement Company, 2.6 per cent of Freeman's sales are to Marquette Cement, and 5.1 per cent of UEC's 1965 sales were to Marquette Cement. Would that accord with your knowledge and recollection?

A I am pretty sure of Freeman but I am not certain about the percentage for UEC to Marquette. It sounds like it might be right.

MR. KEMPF: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. EISEN: On the record.

[82] BY MR. EISEN:

Q 2.6 per cent of Freeman's 1965 sales were to the Central Illinois Public Service Company at Springfield, and 3.6 per cent of UEC's 1965 sales were to the Central Illinois Public Service Company at Meredosia and Grand Tower.

A Yes.

Q Does that remain the same?

A I agree with that, yes.

Q Are there any other companies that I have not mentioned to whom both UEC and Freeman sell? Let me ask you this first: Are there many small accounts, or could there be many small accounts that they both might sell that you would not recall right now? Are there such?

A I do not know of any. I do not recall any.

Q You do not know of any others, other than those I have named?

A No.

Q Has UEC solicited any customers of Freeman, other than the ones I have named here, and been unable to effect a transaction of sale?

MR. KEMPF: May I have that read back, please, Mr. Youker.

[83] Q (Read by the reporter.)

BY THE WITNESS:

A I do not know that they have.

BY MR. EISEN:

Q Does Freeman sell to Inland Steel?

A Yes.

Q How about UEC?

A No.

Q Freeman sells both steam and metallurgical coal to Inland Steel?

A No. Only metallurgical coal.

Q Only metallurgical coal.

A Yes.

Q The total figures I get from what we have read here is that approximately 54 per cent of Freeman's 1965 sales were to customers that were also sold by UEC and 60 per cent of UEC sales were to customers also sold by Freeman.

Do you have a figure which you have in mind, based on your day-to-day experience in the company, which you could suggest would be closer than that?

A I have never thought of it in that light, but from the figures you have mentioned, and if they [84] add up to that, then I have no reason to question them.

Q Would you say that the percentage has been increasing, the percentage of sales, to common customers of the two companies?

A No. I do not think so.

Q Other than that one increase to Union Electric that you mentioned?

A Yes. No, I do not know of any others.

Q What type of coal does Freeman sell to Commonwealth Edison?

A They sell their Central Illinois Coal, which is principally a steam generating coal, utility coal.

Q That is from the Crown mine?

A Yes.

Q Is any Southern Illinois coal sold to Commonwealth Edison?

A No; not any of our Southern Illinois coal.

Q What kind of coal does UEC sell to Commonwealth Edison?

A To Commonwealth Edison?

Q Yes.

A They sell their strip coal from their [85] Buckheart mine, which is a utility coal.

* * * *

[107] Q Could you list the competitors of Freeman for us?

MR. KEMPF: Competitors of Freeman in the coal industry or in the nuclear industry? In what context are you talking about competitors?

MR. EISEN: In the coal industry.

BY THE WITNESS:

A In the coal industry?

MR. EISEN: Yes.

BY THE WITNESS:

A Peabody, Truax-Traer or Consolidation Coal Company, Bell & Zoller, Sahara, Ayshire. Did I miss any?

MR. CUSACK: What about Zeigler?

BY THE WITNESS:

A Bell & Zoller, yes, or Zeigler. I though I named Bell & Zoller.

BY MR. CUSACK:

Q One is a parent of the other?

A Yes. I don't know which is which. I call it Bell & Zoller. They are operating mines.

BY MR. EISEN:

Q Southwestern?

A Yes.

[108] Q Do these same companies also compete with United Electric Coal, or if any of them do not, or if there are others you would like to add, we can take them one at a time, if you wish.

A Are you talking about United Electric in relation to these other competitors?

Q Yes.

A Peabody, yes. Bell & Zoller, yes. Sahara, no. Truax-Traer, yes. Southwestern, yes.

Q You did not mention UEC as competing with Freeman.

A Yes.

Q And does Freeman compete with UEC?

A Yes.

Q How can they compete when they are both owned by the same company?

A They do.

Q Are all of your mines able to sell coal beyond the Freight Rate District in which they are located?

A Are all of them able to?

Q Yes.

A Yes.

Q That is, both by UEC and Freeman?

[109] A Yes.

Q Would you have an idea of what percentage of the Freeman mines' production is sold in the district where each mine is located?

A Are you talking about districts or are you talking about—

Q Freight Rate Districts.

A Freight Rate Districts?

Q Yes.

A It would be small. I would have to look at a map, if I may.

Q I am going to show you a document which has previously been identified as Nugent Deposition Exhibit 38, I believe.

A Yes.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

THE WITNESS: Now, if you will repeat the question for me, concerning Freight Rate Districts, I think I understand it, but I would like to have it repeated.

MR. EISEN: Would you read the question, please, Mr. Reporter.

• • • •

[126] MR. HEDLUND: What is the question pending? Is there a question pending?

MR. EISEN: Yes, there is.

MR. HEDLUND: May I have that, please, Mr. Youker?

Q (Read by the reporter.)

BY THE WITNESS:

A That is a natural understanding of competition, rivals.

BY MR. EISEN:

Q That is the way businessmen use the expression every day, isn't that right, in the conduct of their business?

A Yes.

Q So in that regard, does the Peabody mine in the

Fulton County area compete for Commonwealth Edison business with the Crown mine?

A I do not know that you would call it competition. Insofar as Commonwealth Edison can get their coal from Peabody, Crown would not be competition at all.

You can call them competitors only to the extent that the supply of coal in Fulton County is not sufficient to meet the needs of Edison, so they [127] have to go beyond that area someplace to get the coal.

Q Does Commonwealth Edison pay a premium, do they pay more per BTU to Crown than they do to Peabody?

A I don't know what they pay Peabody.

Q Do they pay more for Crown mine coal per BTU than they do for Buckheart coal per BTU?

MR. KEMPF: Just a minute, please. May I have the question read, please, Mr. Youker?

Q (Read by the reporter.)

MR. KEMPF: Are you talking about their end cost per BTU delivered, through their own facilities and things like that, or are you talking about F.O.B. mine, or what?

MR. EISEN: The witness has the question.

MR. KEMPF: If the witness understands the question, he may answer.

BY THE WITNESS:

A I do not recollect what the prices are. My recollection is that the F.O.B. prices are similar on a BTU basis. I do not know about the delivered prices.

BY MR. EISEN:

[128] Q Would you say that they were the same?

A Similar; almost the same.

Q By "almost", you mean what? One or two cents a ton?

A Within a few cents, yes.

Q Could you describe how the location of present and potential customers of UEC affects its ability to compete?

MR. KEMPF: Will you read the question, please, Mr. Youker?

Q (Read by the reporter.)

BY THE WITNESS:

A I do not exactly understand what you are getting at, but if you mean the potential customers that UEC could possibly serve, any utility with a plant in the future that may be near the location of the Fulton County area, naturally UEC would be in a better position to compete for it, if they had the reserves to do so. I do not know if that fully answers what you are driving at.

* * * *

[129] Q What advantages does that coal have now, in the light of its transportation cost factor, with regard to existing customers?

[130] A Some specified customers, they would have some advantage because they are on the Illinois River, or near the Illinois River.

Q Do they go down the river as well as up the river?

A Yes.

Q How far down do they go?

A Their present customers?

Q Yes.

A I don't know how far.

Q Is coal purchased on the basis of BTU? We have mentioned that before. Is that on the basis of British thermal units, the heat units?

A That is one of the criteria; BTU, sulphur content, the fluidity of the coal, the moisture and the ash.

Q What does "fluidity" mean, sir?

A Fluidity means the temperature at which the material in the coal will melt and be able to be disposed of.

Certain plants are designed to burn high fluidity coal or low fluidity coal and you cannot substitute one for the other, or you will burn the plant up. Another term for fluidity is [131] fusion of the coal.

* * * *

[154] Q Yes.

A Yes, sir.

Q What does "control by location" mean?

A If I understand what you are asking, it means that certain reserves, by the nature of the location of them, control other reserves that are not readily available to someone else, what we call checkerboarding.

Q With that explanation, does Freeman control any reserves by location?

A Yes, they do.

Q Is that in the area of each one of the Freeman mines?

A In the case of Freeman it only applies to one location, and that is the Crown acreage, the so-called Crown acreage.

Q Is that in addition to the mining properties which we have previously discussed?

A I don't follow the question.

Q The previous figure you have given was 236,501,-720 tons, plus 360,000 tons recently acquired.

A Oh, yes. It is in addition to that. There are additional acres that we consider [155] are controlled.

* * * *

[160] Q Is there a rule of thumb that coal mining [161] companies follow in this regard?

A You mean as to the price they would pay?

Q No. As to the amount of money budgeted for that purpose.

A The money budgeted for that purpose?

Q Yes.

A There is no rule of thumb. In the case of United Electric, we have an open bank account, and if we can find reserves that can be mined at a reasonable price, we can go get them. I do not think we would have any trouble.

Q Do you have somebody out looking?

A Oh, yes.

Q Who is out looking?

A We have a geologist who spends his full time, a fellow by the name of Bill Jensen. We have a land man named Tom Latimer, who spends all of his time trying to acquire additional reserves.

We have a Western representative who is looking at all the Western coal reserves, who is trying to find suitable reserves for stripping, that is, find reserves suitable for stripping for a proper customer.

Q What is your Western man's name?

[162] A Tom Tarzy.

Q Is he an executive of the company?

A Yes, he is. He is a vice-president, of the Western operations.

Q Are you spending money at Freeman looking for reserves also?

A When you say "spending money", I do not know what you mean.

Q Well, do you have people out in the field?

A Yes. We are constantly looking for reserves for Freeman also.

Q Who are the gentlemen at Freeman who are out looking for reserves?

A Bill Mullins, who is our chief engineer at the property, and then I look a lot myself, not physically, but I am always searching, to keep tab on any reserves that I hear about that may be available.

Q Have you increased the amount of money allocated for searching for and acquiring reserves at UEC over the past five years?

MR. KEMPF: I think the witness has already testified that they have, I think in his words, an open bank account. I do not know how you [163] can increase that.

BY THE WITNESS:

A Is that the question you asked, if we have spent more money?

MR. EISEN: If you know, yes.

BY THE WITNESS:

A I would say that we are—I do not know how diligently they were searching beyond five years ago, but I know that within the last two years we have made an extraordinary effort to try to find reserves for UEC.

BY MR. EISEN:

Q It is a fact, is it not, Mr. Camicia, that there is coal being mined today that was considered unrecoverable, strip coal, twenty years ago?

A Yes. That is true.

Q Some writers have estimated that Illinois is the leading state in bituminous coal reserves.

A Yes.

Q Have you seen that in coal magazines and so on?

A Yes, I have.

Q Would you say that certain underground coal reserves not thought to be commercially re- [164] coverable today will in fact be commercially recoverable five years from now?

A If you put a limit of five years, I would say no.

Q Ten years?

A Perhaps some underground coal would be minable, simply because the prime reserves have been mined out and you have nothing else, and you must go to it at a higher price.

Q With reference to the Denmark reserves, are they about the last of the prime reserves in Illinois?

A As far as I know, in Illinois, yes, that are uncommitted.

Q Have you tried to buy some of those Denmark reserves?

A Well, I understand that Mr. Nugent recently told me that he had tried to buy the Denmark reserves, and he has handled that himself.

Q What did he tell you?

A He just told me that he tried to buy them, without success.

Q He said that he approached certain individuals?

A Yes.

[165] Q Whom did he approach?

A Ayrshire.

Q Did he name the man?

A I don't recall who it was. He told me he had written a letter.

Q Would it be Norman Kelb?

A No. It would not have been Norman Kelb.

Q I think you said they had about 200,000,000 tons.

A Yes. That was my estimate of their reserves.

Q Is it possible for them to mine out all 200,000,000 tons without constructing new mines?

A Oh, no. They would have to construct a number of new mines. They have no mines in the area.

Q Oh. They don't?

A No. It is a virgin piece of property.

Q Based upon your knowledge and experience, what would you predict ten years from now will be the factors, the feasible factors in so far as depth of coal and thickness of coal, seam ratio and so on, as far as strippable coal reserves?

A There are really two questions there. In so far as the technical ability to remove overburden [166] is concerned, I think that the limit is pretty well established, and that is possibly up to 120 feet, and that is by reason of the spoil banks, the angle of repose of the material that you dump behind you, that would incline to come in to your coal bearing pit.

• • • •

[171] BY MR. EISEN:

Q Have you ever talked to Mr. Simon and asked him where he got these figures?

A No, I haven't actually talked to him. I don't have to ask him, because I know. Anybody in the coal business knows that that kind of reserves are not in Illinois or any place else.

Q Is there long wall mining in Illinois?

A There is one installation in Illinois.

Q Where is that located?

A Old Ben 21 mine.

Q Is it possible to use the long wall method at Round Prairie?

A No, absolutely not.

Q Why is that?

A We are going to get back into that pillar mining again, but Round Prairie has several reasons that you could not use long wall.

One is because the limestone comes down right on top of the coal and will not fracture or break behind mining.

Secondly, there is not enough over- [172] burden to cause enough pressure on the coal so that you can properly cut it.

Q It has to be deeper also, then?

A Yes.

Q What is the ratio of—first, could you describe for us what "ratio" means in terms of overburden to depth of seam?

A Ratio is a cubic yard of dirt to a ton of coal.

Q In other words, the cubic yards of overburden to a ton of coal?

A Yes. A rougher way to say that is the number of feet of overburden in relation to the number of feet of coal.

For example, if you had 100 feet of coal—I mean, 100 feet of overburden and 10 feet of coal, you have a ten-to-one ratio.

Q So the two things are about the same? Is that what you are saying?

A Yes, except that the previous definition I gave you is more technical.

Q Which definition do you use in your business, in correspondence and so on?

A We use the footage definition, but [173] in our engineering studies we use the other method.

* * * *

[174] Q When the prime reserves of Denmark are out, then the feasibility of the higher ratio [175] becomes possible, or it becomes feasible, really?

A Up to a point, but you have to realize then that you are getting closer to the costs of underground mining, and your competition there narrows.

Q There are plenty of good underground reserves around, that it?

A Not available, no. There are some underground reserves, some good underground reserves, but everybody has got them. Somebody has got them all.

Q I don't know. It seems to me that if atomic energy poses a possible serious problem to coal companies with all these underground reserves around, or even strip reserves, in spite of the fact that they are all taken up, is it not possible that some of these companies who have these reserves might want to take a short term profit?

MR. KEMPF: If counsel knows of any availability of any such reserves which he wishes to submit to us for appraisal, we will be happy to do so.

* * * *

[189] Q That coal, as we understand it, is not part of the same geological layer, or something like that.

A It is the same seam of coal.
Q It is the same seam as the Round Prairie seam?
A Yes.
Q Is it the same quality as the Round Prairie coal?
A No, it is not.
Q When do you expect or anticipate that you will use the Round Prairie reserves?
A At the present estimate we do not know when to ever expect it to be profitable to mine that area. It certainly would have to be after the strip coal in that area has been all mined out, and perhaps the coal in southern Illinois.
Q Has UEC ever sought or acquired any reserves on behalf of Freeman?
A No, they have not.
Q You have separate staffs out looking for reserves, one for Freeman and one for UEC?
A Yes. However, on some occasions they [190] work together, where a property may be strippable and deep mine.

* * * *

Q Has Freeman undertaken to acquire strip [191] reserves at any time, do you know?
MR. HEDLUND: At any time? I am sorry. Is that what you said?

BY MR. EISEN:

Q At any time within your knowledge.
A Within my knowledge?
Q Yes.
A Yes. To the extent that a property we looked at in West Virginia had some strip acreage or contour mining acreage on it. It was principally a deep mine or underground proposition.
Q If Freeman found strip reserves in Illinois, would Freeman mine it?
A No, they would not. That is sort of a moot question, because Freeman could not find any strip reserves in Illinois because there are not any available.
Q What about the contrary? If UEC found deep reserves, commercially recoverable, would they mine it?
A No, they would not. They are not able to mine it.

* * * *

[193] THE WITNESS: Ask the question again, please.

MR. EISEN: Will you read the question, please, Mr. Youker.

Q (Read by the Reporter)

BY THE WITNESS:

A UEC has not found any deep reserves and none have been turned over to Freeman.

BY MR. EISEN:

Q They have not found any other than the ones you have told us about at Round Prairie?

A That they have had for some years, that is correct.

Q Is it your testimony that if they did find some deep reserves, they would turn them over to Freeman?

A If Freeman wanted them and if they were suitable for mining, I think they logically would.

Q What would it cost to put in a mine at Round Prairie?

A For what capacity? For what customer?

Q Well, you can tell us for a million tons [194] first, and then for two million tons.

A For a million ton mine it would cost, for full preparation of the coal and to meet the market, it would cost in the neighborhood of six to seven million dollars.

Q That is the cost including the washing plant?

A Yes.

Q Does that include unit train loading facilities?

A No. You would have to add about a million dollars to that.

Q Did you have in mind using the slope method when you gave us that figure? You characterized it yesterday, I believe, as the slope method rather than the shaft method.

A I said you could use the slope there, and that is possibly what we would decide to use.

Q Would your estimate be lowered somewhat if you were able to use the slope method?

A That method includes the slope method.

Q Does UEC have any mining personnel who have had underground experience?

A No, they do not.

• • • •

[196] BY MR. EISEN:

Q I believe you testified yesterday that there were no restraints on you financially by General Dynamics, insofar as acquiring reserves is concerned. Was that your testimony?

A Such reserves would have to be satisfactory reserves, minable and merchantable, and capable of making a profit.

Q With that in mind, what have you done, or anyone under your direction, to acquire additional reserves for UEC which would—

A I think I answered that yesterday.

Q I was going to ask you: Have you contacted any other coal companies?

MR. KEMPF: You asked that question and it was answered yesterday also, counsel.

BY THE WITNESS:

A I answered that yesterday.

BY MR. EISEN:

Q I believe you answered it by saying that you have not contacted any coal companies.

A I said that I had not contacted, but our company has contacted the Ayrshire Coal Company concerning the Denmark acreage.

[197] MR. KEMPF: Counsel, you are going over ground that you went over thoroughly yesterday, and I do not think you need to reconstruct the transcript from yesterday. It will speak for itself.

BY MR. EISEN:

Q What was your offer to Ayrshire?

A We asked if they were willing to sell the Denmark acreage. I am not thoroughly familiar with the transaction because I did not handle it.

It was handled by Mr. Nugent, and my understanding is that he asked if they would be willing to lease or sell the Denmark acreage.

Q Did Mr. Nugent tell Ayrshire that he had a blank check?

A Certainly not. He would not tell them that.

Q Well, I mean—

A You don't go to buy something and say, "I'll pay you anything you want for it."

MR. KEMPF: Mr. Eisen, we went through this whole area very thoroughly yesterday, and I think our busy executives [198] of the defendants have more to do than answer questions which you have already asked in your interrogatories, or to answer questions which you have asked during the course of the deposition yesterday. I respectfully suggest that you move on to new ground.

MR. EISEN: I realize that this is a sensitive area for you, counsel, but—

MR. KEMPF: It is not a question of its being a sensitive area.

MR. EISEN: —I have to go into it.

MR. KEMPF: The question is whether you have already asked and had answers to the questions.

MR. EISEN: I think we are taking a lot longer by arguing about it than if I were just to ask him a few more questions. I think all he said yesterday was that he understood Mr. Nugent had written a letter, and I did not go into it any further than that.

[199] MR. HEDLUND: He has testified, Mr. Eisen, that he is not familiar with the transaction, that it was handled by Mr. Nugent. Why don't you just ask him all he knows about it?

BY MR. EISEN:

Q Mr. Cancia, is this all that you have done, to your knowledge, in attempting to acquire additional reserves from other companies?

A When you say "other companies", do you mean just coal companies?

Q Any companies. I do not mean your ordinary day-to-day looking for reserves from landowners, farmers, or individuals. Is this letter all that you know of?

A As far as direct contacts with other coal-producing companies, that is the only one that I know of.

You must understand that we are doing a tremendous amount of work, looking for reserves in the west, in Wyoming and all of that territory, and West Virginia. A lot of this is from railroad companies and from the government, which controls most of the land in the west.

There are no coal companies that you can [200] contact in that area to talk with about reserves, because nobody controls them but the government and the railroads.

* * * *

[216] Q Under what length of contract do you supply the large accounts?

A Either five or ten years, usually five years with the opportunity to renew for an additional five years.

Q Does the price specified in the contract remain constant throughout the duration of the contract?

A No, it does not. It has provisions for escalation for wage increases or contract increases and supply increases.

Q Those provide for what, a renegotiations of those terms, or the price? Do they provide for a renegotiation of the price in the event of changed conditions?

A I do not know that you would call it a renegotiation. For example, when we have a new wage contract and the contract with the United Mine Workers provides for perhaps a five per cent increase in wages, then we have the opportunity to go to our customer and say, "Here is the effect of that wage increase on the cost of production at this mine", and we have to prove our point, and we are allowed that increase.

[217] Q What does the contract provide in the event of a disagreement?

A Each of our contracts are written differently, and there are provisions in each of them for any disagreement.

Some of them go to arbitration, to an umpire, and so forth, but usually they are so written that it is pretty clear on these particular points of escalation.

Q Is the arbitration compulsory arbitration?

A In some cases, it is. In one contract that I know of, I think it is the Edison contract, if there is no agree-

ment, then either side has the right to suggest that they go to arbitration, and if the other side does not want to go to arbitration, then he has to make a settlement otherwise.

Q So it is possible that you could lose an account, if you could not get together on the arbitration, or on an agreement as to what the escalated figure ought to be?

A It depends on the contract, again. I guess it could be possible that you would [218] lose an account, but not normally on the escalation clause.

The place that you might lose a contract is on the renegotiation of the contract for price, with respect to which certain contracts have that provision.

Q Has it ever happened that a contract that was to run for five years or ten years was lost to a competitor because you were unable to—or that you gained from a competitor because they were unable—

A None that I know of.

Q —to renegotiate the price?

A None that I know of in our companies.

Q Have you heard of it happening in other companies?

A No. I am not knowledgeable of any.

Q There is just the possibility, then?

A It could happen.

Q You have no knowledge of its having happened?

A No.

• • • •

[5]

EXCERPTS FROM DEPOSITION OF JOHN M. MORRIS, TAKEN SEPTEMBER 25, 1968 AND OCTOBER 1, 1968

* * * *

Q Since your retirement what work have you been called upon to do?

A I was called here last year two or three times in connection with some of the accounts we had been selling and do sell coal to, for advice and counsel. That's about the extent of it so far.

Q When did you retire?

A I resigned on November 1st, 1966, but after November 1st, 1965, I notified them, or at that time I notified them that I wanted to be away considerably, and I did want to retire as of that date, but they asked me to stay on until they were able to put these two companies together, which occurred at about the time I retired, November 1st, 1966, so I haven't been active at all, outside of what I have mentioned, since November 1st, 1966.

Q Could you tell us something about yourself, your experience in the coal industry?

A It has all been in the coal industry. [6] Do you want it from the very beginning?

Q Yes, briefly, sir.

A Well, I got out of high school in 1917 and I took a job for about six months with the Big Four Railroad in Harrisburg, Illinois, as a clerk making out weighbills for coal.

Then I went with the Saline County Coal Company in Harrisburg. That was in about 1919.

Q Is that Harrisburg, Illinois?

A Yes.

Q All right.

A I was there as a clerk and also as a salesman until 1924, when they brought me to Chicago.

I worked for them in Chicago from 1924 to 1928, mostly in sales and some office work. In 1928 that company was bought by the old, then existent Peabody Coal Company, and I was out of a job.

I went to work for the Electric Coal Company, which was purely a sales company, partially owned by United Electric Coal Companies, with an exclusive sales contract to sell all of United [7] Electric's coal.

That company went out of existence, or was dissolved probably in 1931 or 1932, and United Electric moved their general offices to Chicago from Danville, Illinois, and established their own sales organization, and I became a part of that in—it must have been 1931 or 1932, I guess. I cannot give you the exact date.

I continued in that capacity until they made me Sales Manager, I think, but I cannot tell you when. They had a vice-president in charge of sales and I worked directly next to him as his assistant, more what it was.

Then in 1954 he retired. His name was M. M. Soule. In 1954 he retired and I was made vice-president in charge of sales, I think in 1954, when he retired, and also went on the board at that time. He had been on the board.

In 1959 I was made president of United Electric Coal Companies, and retired as I told you.

Q Who was your boss when you were vice-president in charge of sales?

A Well, when I was vice-president in charge of sales, Kolbe was president of the company and [8] I reported to him, Frank Kolbe.

* * * *

[14] The two things combined—I can't tell you how much of each—had the effect of increasing the depreciation.

Q What was the new IRS guideline for taking depreciation, if you recall?

MR. HEDLUND: I am going to object to that question. I do not see what materiality that has with respect to any issue in this lawsuit.

MR. EISEN: I will withdraw that question for the time being.

BY MR. EISEN:

Q If in 1964 the 1959 IRS regulations were still in effect, wouldn't the earnings per share of UEC in 1964 be substantially higher?

A Will you ask that question again, please, sir?

MR. EISEN: Will you read the question, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A Yes, they would. The earnings would have been higher. Your taxes would have been higher and your depreciation would have been [15] less and your cash generation would have been less.

I think I said that in this memorandum. I reversed it. If you will look at paragraph 3 on page 1C—do you see that?

* * * *

[31] Murray was Treasurer before 1959 and remained. Utterback was made Secretary. I [32] think the same, practically—I do not know of any officer, outside of Kolbe who became chairman of the board and then when he reached seventy he was retired, but all the rest of them were the same after 1959 that they were prior.

I think your annual reports will be a better guide to that than what I can tell you.

Q What advantages, if any, accrued to United Electric by virtue of being part of or associated with General Dynamics?

A The biggest advantage was their tremendous reserve position compared to ours, and with the change in manner and basis of buying coal by these large utilities, we were very vulnerable.

We could not continue our position with them when contracts ran out or when they asked for new bids, and that started to develop very strongly in about 1958 or 1959.

The first indication I had of it, or one of the first, was when Central Illinois Light Company refused to extend their contract, and when other utilities, when they had tenders they were putting out for bids over long term [33] contracts, they just didn't send us any.

Q Where is Central Illinois Light Company?

A Peoria, Illinois.

Q As I understand your testimony, you were refused—

A There is a letter, I think, which was submitted to you from them stating that, in part of the papers you asked for.

Q Was it only because of reserves that they refused to enter into a contract with you?

A Yes.

Q Is that right, sir?

A That is right, yes.

Q How did Freeman enter into this picture?

A They had a big reserve position in Central Illinois, near the Crown mine, which, as Fulton County mined out, would be in a good position with this new unitized train rate idea to supplement and complement and back up any contract that we might make.

* * * *

[54] Q Is it your experience that in order to fulfill a contract such as the example we [55] covered here with regard to the Vipco plant, there is always a little cushion left and when you think you are running out of a seam, there is always a little more coal that you can always milk out of there?

A It can go either way. You can make a big error either way, particularly in a strip mine.

Q How much additional tonnage, if you recall, did you take out of the Mary Moore mine after June of 1960?

A I cannot tell you. The record will show it.

Q Did you supply anybody besides—

A No. A hundred per cent of it went to Vipco.

Q Could you give us the names of all UEC customers who told you that they thought UEC did not have sufficient reserves?

A All I can tell you—I will tell you one I can remember, yes. Union Electric Company.

Q Where are they located?

A St. Louis is their headquarters.

Q You had a conversation or a letter [56] from someone from that company, where they told you—

A I had conversations with them.

Q Approximately when was this?
A Oh, 1963 or 1964; 1963 or 1964.
Q With whom did you have the conversation?
A Mr. Martin Koval, K-o-v-a-l, I believe. He was in charge of coal procurement.
Q Was this in person or over the telephone?
A No; in person.
Q In St. Louis or in Chicago?
A In St. Louis.
Q What was the subject of this conversation?
A Well, they were coming up for some bids for new stations, for a long-term contract, and he said he did not think it was worth while to send us a tender because we could not bid on it anyway under the length of time and tonnage, and so forth.
Q Had you been supplying him prior to [57] that time?
A I have a contract with him now.
Q From which mine?
A From Fidelity.
Q What did you say to him at that time?
A Well, he had a map of all of our reserves and all our acreages that we had to supply him when he made his existing contract, and there wasn't much that I could say to him. He knew it.

I did tell him about our relationship with Freeman and that we might be able to work out a joint arrangement some way so that Fidelity could be supplied until it ran out and Freeman take over beyond, but apparently that was not suitable to him because he didn't send us a tender, as I recall, on that particular bid.

Q You said, however, that you did continue to supply him?

A We are on a contact that will expire in—well, it shows in the record, I don't know, in two or three years, I think. This contract was made about seven or eight years ago.

Q What did he say when you said that [58] Freeman reserves could back up your reserves?

A I don't recall now. I don't recall every part of the conversation. I don't remember what he said.

Q Did you submit a bid on that contract despite his statement?

A We couldn't, under the terms of the bid. I would have to get the bid to refresh my memory, but we couldn't.

For one thing, I remember, that bid required fast loading for unitized train movement, which meant we would have had to put in that type of facility at Fidelity to accommodate it.

Q So that—excuse me.

A That was one thing we did not have.

Q So this was one thing that would have prevented you from taking the contract, regardless of the amount of coal you had left available?

A That was one thing, unless we decided to spend the money necessary to build that sort of a device, which we might have had to consider seriously from the standpoint of our [59] reserve position, as to whether or not we would be justified in spending the money for it.

Q Were there any other customers with whom you had communications or conversations—

A Well, Central Illinois—

Q Excuse me.

A Yes.

Q Let me finish the question.

A I am sorry.

Q (Continuing)—communications or conversations in which they have discouraged you or refused to accept your offer to supply coal because they thought you had insufficient reserves?

A Central Illinois Light at Peoria.

Q Was that the same transaction that we discussed here before?

A Yes.

Q Who did you have the conversation with there?

A Mr. Wellington, Q. W. Wellington.

Q Is that "Q" or "Hugh"?

[60] A Q. We called him "Duke."

Q What is his name, Quincy?

A I think so. He didn't like it.

MR. EISEN: Off the record.

(There was a discussion off the record after which the taking of the deposition was resumed as follows:)

MR. EISEN: Back on the record.

BY THE WITNESS:

A He is vice-president, and we not only talked about it, but he wrote me a letter which I believe is part of these documents you have.

BY MR. EISEN:

Q You discussed with him, though, the possibility of Freeman backing up UEC?

A Yes.

Q And he went along with you on that?

A No. He hasn't yet. He hasn't yet.

Q I thought that your testimony had been that that was one example of where they had backed you up in supplying coal.

A They had not backed me up. I said I figured that they were a complement to us and [61] that would develop in the years to come, when we did run out of coal, and I was using it as much as I could to preserve our position with the customers we had, as an indication of protecting their coal requirements for the future.

Q From what mine were you supplying—what was the name of this company?

A Central Illinois Light.

Q Central Illinois Light?

A Yes.

Q From what mine were you supplying that company?

A We were supplying it from the Cuba mine.

Q As far as you know, you are still supplying them from the Cuba mine?

A Yes, and will until the mine runs out of coal.

Q How much coal is left at the Cuba mine?

A I don't know as of today. Back in 1965, when I left, I figured that if we were able to get some acreages that we were trying to get right around us, I think at that time I estimated about seven years from then, so it would [62] be maybe four or five years from now.

Q Are there any other customers with whom you have had these conversations?

A Well, I didn't have any conversations with them, but I think our sales people have, and they reported to me that that was a matter of concern.

Q Which sales people and what companies?

A I can't remember now—well, I can remember that Commonwealth Edison is concerned with our reserve position, yes, but I had no conversations with them.

Q Who was the man at Commonwealth Edison, as reported to you by your sales people, who was concerned?

A That would have been whoever was in charge then. They change so much. I think it would have been Glen Beaman.

Q You said "then."

A No. "Glen", Glen Beaman.

Q No. You said whoever was in charge "then." When is your recollection as to when this was?

A I would say three or four years ago.

* * * *

[75] Q Where was that located?

A Near Madisonville, Kentucky; east of Madisonville, Kentucky.

Q Yes.

A In their coal ownership or coal leases they had underground coal adjacent to it—I forget the amount, it was not too big—and when they quit mining they left the tipple, the washing plant, the tracks, the buildings and everything else there, because they had no use for them elsewhere, and they were trying to get somebody to come in and mine out this underground coal.

They came to me with it, and to mine it out, you would have to get a place to sell it, and the only place to go with it would be to put in a bid to the TVA, and if successful, put in the necessary equipment to bring the coal to the surface.

They had everything else there they needed, but you would have to put in the slope and put some underground mine machinery in.

I presented it to Nugent to see if they were interested in taking some old equipment they [76] had in some of their mines in Illinois and putting it down there and bringing the coal out and putting it through the plant that was already there, and selling it to the TVA.

If you got a bid from the TVA, it would require quick action. It would require getting in there and starting your mining in a relatively short time.

Most of those bids required delivery to start in probably five or six months, and nobody I could think of would be in a position to do that, who had the know-how and who had the equipment available to move down there and start to work, except Freeman, and being associated with them the way we were, I presented it to them. That's the highlights of the letter.

Q Were there other instances of this character, where you came across coal which you referred to Freeman for their possible interest?

A When we had any underground coal that looked like it had any possibilities, I discussed it with them as to whether or not we should make any move on it, to try and get it.

[77] Usually Frank knew all about the field and knew what the possibilities were, and our prime interest was, of course, to try and find strip coal, but we did run across underground coal in our efforts, and when I did, I always talked to him about it, but I do not think I had any other instance where we made a specific proposition such as that, because this was rather peculiar in the fact that it did not require too much investment and too much in the way of building plant and all that sort of thing.

About all you had to do in that case was get some underground mining equipment, get it down there and put in a slope of 150 feet, which is not too deep, and go to work, and the tonnage was relatively small.

Q Why couldn't UEC mine this coal? Why did you have to turn it over to Freeman?

A We had no underground people who knew anything about underground mining. We had no organization. We had no equipment readily available—I mean, any equipment available at all, and they did. We couldn't undertake it.

* * * *

[150] (Read by the reporter.)

MR. HEDLUND: That is not a question, is it?

MR. EISEN: Yes—question mark.

MR. HEDLUND: You are asking him if that is a correct statement, Mr. Eisen?

MR. EISEN: Well, yes. That is a leading question, admittedly.

A Well, that was the purpose originally in buying the land, that we thought we had something that could be developed. We paid farm land prices for this coal, we didn't pay what you would normally have to pay for coal lands. And it appeared that sometime this might develop, but we were never able to put together a large enough area that we thought we could strip to justify the money in the form of investment that was necessary. So today I presume the situation remains the same, even maybe worse, with these unitized train rates.

MR. EISEN: Does the stipulation apply to Morris deposition Exhibit No. 22?

MR. HEDLUND: It does.

BY MR. EISEN:

Q Does United Electric still own and operate a dock at Warsaw, Illinois?

A I am not sure. That dock was built by the [151] T. P & W Railroad and I forget the details of the ownership. I believe it belongs to the T, P & W Railroad.

• • • •

[153] A We never got to that point of serious discussion. I may have talked about it, but I have forgotten any specific conversations I had.—but we never got that far.

Q Were you ever turned down by those railroads?

A Never got to that point, no.

Q Who did you talk to at—

A I don't remember now. I know with the T, P & W, I talked to Mr. Russell Coulter, who was president of the T, P & W at that time. With the Burlington, I have forgotten who, if anybody, I talked to.

MR. EISEN: Does counsel know if UEC still owns the Warsaw dock?

MR. HEDLUND: Counsel doesn't know.

BY MR. EISEN:

Q Did any of the Iowa utilities located along the Mississippi ever come down and look over the Industry field?

A Yes. We had some discussions with the Iowa Southern Utilities or the Iowa Southern Utility at Centerville, and the Illinois Iowa Power & Light Company at Davenport.

Q What about Iowa-Illinois Gas Electric?

A Well, that is the one I mean.

[154] Q Is that the same one?

A Yes.

Q Iowa Southern Utilities?

A At Centerville.

Q Those are the two that you have been talking with?

A Those are the two.

Q Did you talk with them about the field?

A No, I didn't. I may have been in on a few conversations, but mostly it was done by our sales department.

Q What was reported to you as to their reaction?

A Nothing favorable. Too little reserve, a relatively high cost production, and no particular interest on the part of either one.

Q I would like to show you a letter, Mr. Morris, from T. H. Utterback, dated November 6, 1963, which is addressed to you. Attached to the letter are two sheets of paper, they are referred to in the letter as sheets which give "the production cost, profit and cash flow estimates" of your Industry field.

MR. EISEN: I am going to ask the reporter to mark the letter Morris Deposition Exhibit No. 28.

(The document was thereupon marked Morris Deposition Exhibit 28, for identification, 10-1-68.)

* * * *

[171] Q —in 1964 again you seemed to be on the verge of success with that field, when Iowa Southern Utilities was interested. Now, is it [172] really a question of a prospective utility getting interested in it that could change the thing? I mean, couldn't it change tomorrow?

A I have no idea. I couldn't guess on that. The three attempts that you mentioned failed. Now, what the future holds, I have no way of judging.

Q Do you think it was a mistake for United Electric to spend over $800,000 to develop this field?

A Well, I didn't have anything to do at the start of it. It was there when I became president. And I don't know what motivated them at the time they started it. Up to now, we have been unable to do anything with it. So, if you can call it a mistake—

Q Who did start it?

A I would think maybe Kolbe did when he was the president.

Q Is it your testimony that the Industry field will never be a minable strip mine?

A That is too big a question for me to answer. I couldn't possibly pass an opinion on that. Wouldn't attempt to do so.

Q Well, you were on the verge several times in the past, as far back even as 1961, of thinking that it was almost immediately feasible for mining at [173] the time Commonwealth Edison was interested, were you not?

A I answered that question. I said nothing ever came of it.

Q Yes. But that—wasn't it—

A We tried to sell them, we tried to sell Iowa Southern, we tried to interest Iowa-Illinois Gas—without success. So those three failures indicated that it was a marginal proposition at best.

Q Well, what is your opinion on if and when the Industry field will become minable?

MR. HEDLUND: Mr. Eisen, I think that question has been answered and asked about three times. I think the record will show that the witness is unable to guess when, if ever, the field is going to be minable.

BY MR. EISEN:

Q Would you say it would become feasible to mine that property when the Fulton-Peoria coal becomes dissipated?

A I don't know whether it would or not. I wouldn't pass an opinion on it, because there are so many—so many other fields available to the market. I mean, pro-

ducers able to put coal [174] into different markets by their locations.

* * * *

[193] Q Front loaders, the development of machines to load trucks, also have been advanced, haven't they?

A Front loaders?—I don't know just exactly—

Q Isn't there a loader made by—I believe it is Caterpillar, that has advanced strip mining methods?

A That must have been in the last two or three years. We never used one of them, or I never heard about it.

MR. CUSACK: Have you heard of the term "high lift"?

THE WITNESS: High lift. But that isn't used in loading trucks in a strip mine, to my knowledge, unless there has been a development recently.

BY MR. EISEN:

Q Is it fair to say that, based on your opinion, what is considered unrecoverable coal deposits today will be feasible tomorrow to mine, that is, in the future?

A I doubt it. I think we have about reached the point where we are going today as deep as we can go. And unless something develops that I can't foresee, I don't believe that 120 and 150 foot overburden will be mined—successfully.

Q By the strip method?

A By the strip method.

[194] That is an opinion. Keep in mind that I have been out of it for the last two and a half years.

Q Well, forgetting the strip method, would it be your opinion that coal which is considered unrecoverable today because of cost and other reasons would become feasible to mine in the future? And I am directing this question to your experience in the coal business, the historical nature.

A Well, if it couldn't be mined by stripping, then, the only other way would be underground mining. And I couldn't voice an opinion on underground mining, because I never had any experience in it, and I know very little about it.

Q Did you from time to time investigate the possibility of developing underground mining properties for United Electric?

A I did not, no.

Q When you say you did not, did someone under your direction?—what I am talking about, while you were president of United Electric?

A No, we—I believe I told you the other day in previous testimony that when we had something that looked like an underground field, we would call in Mr. Nugent's organization and ask them to decide what [195] could be done with it.

Q Yes, you did mention that. But I am going to direct your attention to the Sangamon County-Petersburg area. Didn't you at one time investigate the possibility of going through an underground mine in that area?

A I don't recall it, sir.

Q I would like to show you a document dated February 24, 1960, addressed to Mr. Tarzy and to yourself from R. J. Hepburn, entitled, "The Davis Property," and ask the reporter to mark that document Morris Deposition Exhibit No. 32.

(The document was thereupon marked Morris Deposition Exhibit No. 32 for identification, 10-1-68.)

A I recall something about this, and I think where he says "however, I would want to check that with people more familiar with it than ourselves," that he was referring to the Freeman people.

Q Weren't you picking that coal up for yourselves?

A No, we were not.

Q You were just going to counsel with the Freeman people?

A We were down there trying to find some strip [196] coal, is my recollection, and this may have come to our attention, and not being underground people, we would ask Freeman to give us their opinion on it.

Q Well, what was your relationship with this Central Illinois Public Service?

A We were one of their suppliers at their Meredosia Plant, and also shipped them some coal to their Grand Tower Plant, and also bought all of our power from them in the Fulton-Peoria district.

Q What do you mean by United Electric not being underground people?

A We have no organization, we have no experience in underground mining. And if we were to attempt to go into it, it would require building an organization that had the knowledge and experience and know-how to do it.

Q Did you ever have any experience in underground mining?

A I drove a mule in a mine once when I was sixteen years old and that was the extent of it.

Q You did have considerable experience, then?

A I got out when they had an explosion, and I have never been back. And that can go in the record.

[197] Q Were any of you UEC's mining engineers—did any of them have that experience, prior experience in underground mining?

A None that I know of, no.

Q Did UEC ever operate an underground mine?

A No. Not to my knowledge.

Q And you came with UEC when?

A In '28.

Q Wasn't there a mine in Kentucky that you had, that was underground?

A We had the Buffalo Creek mine. And when the overburden got too deep, we attempted to put a machine off the bottom, where we had stripped, into the sidewall, and failed miserably. I don't think we had it in there over a few months. We couldn't get anybody to go back in there when the machine broke down.

Q It is your recollection that you only had it in there a few months?

A I couldn't tell you how long. I wasn't—I was in the sales entirely at the time, and I didn't pay too much attention to it. So I don't know how long it was in there. But it failed, I know that.

• • • •

[207] BY MR. EISEN:

Q Did you also, Mr. Morris, at one time investigate underground property west of Greenville, Illinois?

A We may have. I don't recall it, off-hand.

Q Do you recall some coal controlled by G. Stuart Jenkins of St. Louis?

A I remember he owned some coal, yes.

MR. EISEN: Let me ask the reporter to identify as Morris Deposition Exhibit No. 35, a letter dated July 17, 1962, addressed to Mr. Morris from R. J. Hepburn, relating to G. Stuart Jenkins, underground coal, west of Greenville, Illinois.

(The document was thereupon marked Morris Deposition Exhibit No. 35 for identification, 10-1-68.)

BY MR. EISEN:

Q I would like to show you this letter, Mr. Morris, and ask you if you can tell us approximately how much coal in terms of tons was involved in that property referred to in the letter?

A Yes, I recall it. It is addressed to me, signed by Mr. Hepburn.

Q Yes, sir, whether you recall how much coal [208] was involved?

A I don't recall, no.

MR. EISEN: Will you stipulate that the stipulation heretofore agreed to with regard to admissibility of documents applies to Morris Deposition Exhibit No. 35?

MR. HEDLUND: Very well.

BY MR. EISEN:

Q I would like to now show you a document, which I will ask the reporter to mark as Morris Deposition Exhibit No. 36, being a letter dated March 14, 1966, from T. H. Latimer to Mr. R. H. Inman, entitled, "Putnam County, Illinois".

(The document was thereupon marked Morris Deposition Exhibit No. 36 for identification, 10-1-68.)

Q The letter indicates that Putnam County is near Greenville—

MR. CUSACK: Granville.

Q Oh, that is Granville.

MR. HEDLUND: That is in Ohio.

A Granville—that is a way down on the Mississippi River, isn't it?

Q Yes. I have to change that.

[209] A Is that where that Jenkins property is?

Q I don't know.

MR. EISEN: Did the prior exhibit—was I misreading that, or did that say, "Greenville"?

MR. SAMUELSON: Greenville.
THE WITNESS: There is two different towns.

BY MR. EISEN:

Q Do you know whether or not we are talking about the same area, Mr. Morris?

A I don't know. Let me look at that letter. Maybe I can tell you.

Q Do you mean United Electric Coal has still another area of underground option that we haven't run into before?

A We looked at anything we ever heard of. And that is on the record.

Q Well, what happened to Mr. Jenkins' property, if you know? Was that referred to Freeman, do you know, sir?

A It must have been, because you see that notation in my handwriting on it.

[210] Q Is that your handwriting that says "bad roof?"

A Yes. So I must have asked Freeman about it.

(There was a discussion off the record after which the taking of the deposition proceeded as follows:)

BY MR. EISEN:

Q I will show you the document and ask you if it doesn't show a lot of coal in that area?

MR. HEDLUND: I will object to your characterization of these documents, Mr. Eisen. I think we will move faster if we let these documents speak for themselves.

Q Were there—well, there is a lot of coal in that area, is there not, Mr. Morris?

A Let me read this letter. I don't know that I ever saw the letter. (Examining document).

Well, you have a question, I believe. I have forgotten what it was, now.

Q I said that there was a lot of coal in that area, was there not?

A That is what this letter says. And the figures are evidently taken from the Illinois Geological Survey Reports, which could or could not be accurate.

* * * *

[217] Q If, Mr. Morris, after consulting with Freeman, [218] they advised you that a particular underground opportunity that you had come across was feasible for mining, would you have kept it, or would you have turned it over to Freeman?

MR. HEDLUND: I will object to the question as asking for speculation from the witness as to what might have happened had something happened. But if he wants to answer, he may.

A Well, I don't mind answering it. My thinking was that we were not underground people, didn't know anything about it. First, we would get their opinion. As to whether we should even go ahead and try to acquire this underground acreage, whether or not it would be put into United Electric, I never pursued that question. I just wanted to know what it looked like, what he thought we ought to do about it, if it was worthwhile pursuing, having in mind all the time, that if and when it was to be mined, they would do it, and not us. Now, whether the title to the coal would be taken in our name or theirs, I never got to that point, because I never found any that was worthwhile. So that would be speculation for me to say what we would have done with it.

Q If Freeman were not associated with United Electric, would your thinking have been the same?

* * * *

[226[Q Did Mr. Nugent have someone prepare a cost estimate with relation to trying underground mining at Fidelity?

A One time when we reached a point real close to the City of Du Quoin and were having some blasting problems, the citizens were up in arms because we were shaking their tea cups, and we had about three or four hundred thousand tons of coal that it looked like we were going to have to give up and not strip, we hated to go away and leave that coal. I believe Nugent sent a couple of his engineers over there to make an estimate on how we could go in underground off the pit with some of his underground machinery and mine that coal out. And I believe he gave us an estimate. I have forgotten

now, but I believe he gave us a cost estimate on what it might cost to do that. And my recollection is that it was so high, that we abandoned the idea.

Q Was that the estimate prepared by J. N. Matheson?

A I would have to look at it to tell you.

* * * *

[234] And adjacent to that property Ruby Chandler Jordan had a lease on about six million tons of No. 9 [235] seam coal, which would have to be mined underground. It was too deep for stripping. And the life of the Ruby Mine was getting rather close to the end—I forget when they mined out—and at that time some consideration was given by Freeman of taking some of their equipment that they weren't using, like underground mining machines, and putting it over there and mining that coal.

Q I think we are duplicating what you have already told us.

A I think we are.

MR. EISEN: Does the stipulation apply to Morris Deposition Exhibit No. 46?

MR. HEDLUND: It does.

BY MR. EISEN:

Q I would like to show you a letter dated November 20, 1957, to Mr. G. I. Grasty of Richmond, Virginia, from T. H. Latimer, the subject is "Coal Lands in West Virginia and Kentucky", and ask the Reporter to mark that Morris Deposition Exhibit No. 47.

* * * *

[236] Q Now, you have investigated other coal lands, though, haven't you, underground possibilities in states, during your term as president?

A Primarily, we looked for strip coal, [237] and sometimes we would run across underground in connection with our strip investigations.

Q Have you looked for strip coal in these eastern and middle eastern states, like Kentucky and Virginia, West Virginia?

A No, we didn't get into that area. It was clear out of our bailiwick. There were a lot of big producing companies down there already formidably established in

the market and in the coal fields. And sometimes we would have somebody write us or come into see us, and if they did, we would take a look at it to see if it was worthwhile. Plus the fact that in the early days of the TVA, when they began to develop rapidly and their coal use increased sharply, we spent a good deal of time down in Tennessee and Kentucky trying to find strippable coal. On that I couldn't give you the years, but that was back in the late 50's.

Q You mentioned that you had an arrangement with U. S. Steel to mine some of their coal in the Danville area?

A It was an acreage rather small in the Merrimore property.

* * * *

[241] Q When do you think it will be feasible to mine the Round Prairie field?

A That is purely a guess. Purely a guess.

Q Do you have an educated opinion?

A I couldn't give you any time or how many years it will be. I can only say that the competitive situation will have to change to where mining that coal would be profitable.

Q During your tenure as president you increased, did you not, the holdings in the Round Prairie field?

A I think we did. How much, I don't know.

Q I would like to show you a document entitled "Round Prairie field", dated January 16, 1963, which appears to be a letter, a two-page letter, addressed to you from Mr. T. H. Latimer, and ask the Reporter to mark that document Morris Deposition Exhibit No. 48.

(The document was thereupon marked Morris Deposition Exhibit 48 for identification, 10-1-68.)

* * * *

[244] Subsequent events indicated that it is going to be a long time, if ever—I wouldn't say "if ever", because maybe someday that field will be mined, but it will have to come after the competitive situation from Belleville strip, southern Illinois raw coal, on volume and unitized train rates have gotten all the business they want or can handle. Then it might be possible to consider this. But when, I couldn't give you any idea.

Q But apparently you felt optimistic about it at this time to pick up the other half?

A Well, I don't know what we picked up. I presume if those figures show it, why, we did. But as of today or as of the time I left the company, there wasn't any indication that it was going to be mined anyway soon.

MR. EISEN: Does the stipulation apply to Morris Deposition Exhibit No. 48?

MR. HEDLUND: It does.

* * * *

[270] As of the time you left, had Alcoa furnished you with any prediction as to when [271] they would be making use of this coal?

A They had not, to me.

Q They didn't indicate to you that they would be using that in the 1970's sometime?

A No, they did not.

Q Did they indicate to you that you would be in a position to mine it for them?

A They said they would consider us. They never gave us any definite commitment, no.

Q Do you feel that you would have an advantage over any other company in mining this coal field?

A You mean United Electric as such, or United Electric Freeman?

Q United Electric.

A United Electric would have a disadvantage of going in there and trying to mine it, because they would consider experienced underground operators instead of us by ourselves. I don't think they would give us any consideration on mining it as United Electric.

* * * *

[275] BY MR. EISEN:

Q Did you ever have a conversation with Mr. Nugent where you discussed the right of first refusal in the event that Alcoa decided not to make use of the Beaucoup acreage?—That is, United Electric.

A I don't think that we had a first refusal. I think all we had was that they would consider, if they decided that they didn't want the Beaucoup field, they would certainly give us every consideration, I believe

is the way they put it, and that was about as far as it went. And I am quite sure I told that to Mr. Nugent.

Q And likewise, they would give you every consideration in the event that they decided to develop it?

A Yes.

Q —As far as your being the company which would mine it?

A We would be allowed to discuss it [276] with them, and they would probably, knowing them and any big corporation, discuss it with a lot of other people, too.

* * * *

[298] Q Do they use any in the winter time?

A It depends on the type of contract they have with the gas company, whereby on [299] cold days when the gas is needed for home heating, they could cut them off. And I don't know now whether utilities had that type of contract or not. Some industries I do know had contracts where they would get gas when it was available in the wintertime, and then when it got cold and the gas was needed for home heating at the much higher price, why, they could cut them off in I guess an hour's notice, I don't know. Percentagewise, I couldn't tell you what it was. But it was substantial, I would say.

Q But not in the wintertime was it substantial?

A Not in the wintertime, no.

Q Do you know what organization or agency would keep records upon which you would rely in determining what such percentages were?

A For the utilities, the Federal Power Commission Records would show it. For other industries, I don't know where you would get those records.

Q Does United Electric and Freeman serve generally the same geographic market area?

[300] A Not entirely, no. Some areas we serve, both of us. Other areas they serve and we do not, and some areas we serve and they do not.

Q What are, in general, the geographic areas which you both serve?

A The Commonwealth Edison plants in the Chicago area are served by both of us. One plant of Union Electric is served by us, another plant is served by them. And I don't think there is much else.

Q What about Central Illinois Public Service generating stations?

A We serve them at Meredosia, and Freeman, too. At Grand Tower Freeman ships them, or did—I don't know what they do now—what would be termed a by-product in the form of dust or carbon. And we sell them our straight screenings, which is a part of our normal production. And that is the extent of our business with the Central Illinois Public Service.

Q Is there competition between Freeman and United Electric?

MR. HEDLUND: I am going to object to that question. That is an ultimate issue [301] to be decided by the Court.

MR. CUSACK: Off the record.

(There was a discussion off the record, after which the taking of the deposition proceeded as follows:)

THE WITNESS: May I answer the question?

MR. HEDLUND: You may.

A I would say that there is no competition at the Grand Tower plant where we both ship, because Freeman is shipping one type of product and we are shipping another. At least, that was the case when I retired.

Q Well, in your experience did you solicit many of the same customers that Freeman solicited?

A Yes. Yes.

Q In bidding on new business where Freeman and UEC had both been soliciting the same customers, in bidding on new business from such customers was it the practice for UEC and Freeman to get together after the association of the two companies, affiliation of the two [302] companies, to determine which mine of both companies would yield the maximum profit in submitting such bid?

MR. HEDLUND: May I have that question read back, please?—You have finished, have you?

MR. EISEN: Yes.

Q (Read by the Reporter.)

MR. HEDLUND: I submit nobody can understand that question. Will you try to rephrase it, Mr. Eisen?

MR. EISEN: Well, if the witness understands it, I would like him to answer.

Q Do you understand the question?

A Not entirely, no.

Q In bidding on new business would Freeman and UEC officers determine which United Electric Coal or Freeman mine would yield the maximum profits, and in the bid designate that mine as the source of supply?

MR. HEDLUND: I still don't understand the question, but if the witness does, he may answer.

A It is a rather involved question and [303] would require some clarification. It would depend on where the customer was, the type of equipment he had, and his requirements for coal and the type of coal he had to have, and the transportation involved, and the competitive situation with other coal producers. A lot of factors would have to be analyzed, and you would almost have to take each specific situation separately to determine what you would do about it.

Q Well, was there any business prior to the merger—

MR. HEDLUND: I object to the question so far. There has been no merger.

Q Prior to your association with Freeman—

MR. HEDLUND: Do you want to give us a date, Mr. Eisen? I think we will move faster if you can pinpoint the period of time that you were talking about.

Q Prior to 1960, were there customers whose business both United Electric and Freeman solicited, whose business was not so solicited after 1960?

A I don't recall of any.

[304] Q What are the outer limits of United Electric Coal's sales area for any of its mines?

A You would have to take each mine separately.

Q You would have to?

A If you want an answer, you would have to.

MR. CUSACK: Off the record.

(There was a discussion off the record, after which the taking of the deposition proceeded as follows:)

BY MR. EISEN:

Q Is there more or less competition in the coal industry today than there was ten years ago?

A There is fewer companies, of necessity, due to the changed market conditions. But my opinion at the time I left, the competition between those companies was still just as great. You had a different type of market entirely.

Q Have any companies gone out of business in the last ten years?

A Do you mean failed or gone bankrupt?

• • • •

[307] MR. HEDLUND: Do I understand that the only purpose that you would want to recall Mr. Morris would be in the event that we have difficulty or are unable to reach agreement [308] on the standing stipulation with respect to these documents?

MR. EISEN: Yes.

MR. HEDLUND: Fine. Are you finished now?

MR. EISEN: Yes. The only thing I was going to say, that we should do that, you know, while we are in St. Petersburg and have Mr. Morris available. That is all.

MR. HEDLUND: Fine. You have concluded now?

MR. EISEN: Yes, I have.

MR. HEDLUND: I have just a few questions.

CROSS-EXAMINATION

BY MR. HEDLUND:

Q Mr. Morris, with the benefit of hindsight and the knowledge that has been gained through the years from studies made of the Industry field, if you were president of United Electric today and the Industry field were brought to you for the first time, would you make a decision to acquire that [309] acreage?

MR. EISEN: I am going to object to that question as highly speculative, calling for a speculative opinion and conclusion on the part of the witness.

Q You may answer, Mr. Morris.

A I would first want to know if the coal was salable and at what price, and do a lot more investigating into the minability of that area. In view of what I know up to now about it, I seriously doubt that I would acquire the field.

Q Mr. Morris, you have testified with respect to the underground coal at the Fidelity mine. Do you know whether that underground coal was acquired simultaneously with strip coal in the same package?

A The part I know of positively was the underground coal that we acquired from the Union Collieries, along with some strip coal that they had.

Q In order to get the strip coal, do you know whether you had to take the underground [310] coal as well?

A That is correct.

Q Mr. Morris, do you know whether, with respect to the Round Prairie field, that field is sufficiently filled in at this time so that underground mining could as a feasible matter be undertaken?

A Do you mean—

MR. EISEN: Answer yes or no. Otherwise, I am going to object.

A You asked me if I knew or—repeat the question, please.

MR. HEDLUND: Would you repeat the question?

Q (Read by the Reporter.)

A I don't know.

Q Mr. Morris, I believe you testified that filling out the Round Prairie field might be helpful in strengthening United Electric's position with Alcoa. Do you recall so testifying?

A I said it might be helpful, yes.

* * * *

[311] Q Mr. Morris, finally, you testified, I believe, that substantial amounts of gas are used in the market served by United Electric [312] in the summer, but that the amount of gas used by United Electric customers in the winter is not substantial. In that light, I ask you whether it is possible, in your experience, to run a profitable coal mine by producing only during the winter months?

A No.

MR. EISEN: I am going to object to that. It calls for a speculative answer.

MR. HEDLUND: I have no further questions.

REDIRECT EXAMINATION

BY MR. EISEN:

Q When United Electric Coal's Fulton and Peoria mines are exhausted, could the sales which are now satisfied from these mines be supplied from the Industry field?

A In my opinion, no.

Q Why not?

A I don't believe that we could achieve a cost factor that would permit it, and the extent of the field, to what

knowledge we have of it at the moment, would not attract large utilities. And the best evidence of that was the attempts we made to interest three utilities, [313] which I testified to earlier, notably the Iowa-Illinois Gas & Electric, the Iowa Southern Utilities, and the Commonwealth Edison.

Q If the reserves generally in the Fulton-Peoria area become depleted, not just United Electric's but other companies', wouldn't the Industry field then become a feasible supplier for the customers which are now supplied from that area?

A I do not think it would.

Q Where would they have to go?

A They would go to Crown, they would go to Denmark, they would go to Captain, they would go to Truax-Traer's mine in Hillsboro, and they would go to Southern Illinois.

Q Would it include the Peoria Utilities, themselves?

A It would.

Q Do you mean the underground mine of Truax-Traer at Hillsboro is more efficient than would be a strip mine operation of UEC at Industry?

A I would not know about their cost factor, except in a general way. But it would be my opinion that it would, with the type of [314] unitized train rate they could get to the destination.

Q Would an underground mine at Round Prairie be more commercially feasible than would a strip mine at Industry?

A It might be under certain conditions.

Q What conditions?

A Extremely favorable operating conditions, and the type of transportation that unitized trains would make possible for them. But—if I may continue?

Q Certainly.

A —You would have Southern Illinois ahead of you. And you would have all of the strip coal available at Captain and Denmark. They would have to be satisfied first, before Round Prairie would be of any value.

MR. EISEN: I have no further questions.

(Whereupon, at 6:18 P.M. the deposition of John M. Morris was concluded.)

* * * *

[8]

EXCERPTS FROM DEPOSITION OF FRANK FREDERICK KOLBE, TAKEN OCTOBER 10, 11, 15, 17, 18, 22, 24, 25, 28, 29, 30, & 31, 1968

* * * *

Q And did you then become active in the [9] management of United Electric as an officer?

A Like Joe before me, I did not like the then management. However, the company was practically in receivership, and the bank determined the chief operating officer. So, I worked with the bank, and I might say against them, because we had some acrimonious times. Finally, they were willing to substitute Louis Ware.

Q Is that W-a-r-e?

A Yes.

Q As president of United Electric?

A As president of United Electric. Ware was a mining engineer and had spent several years at one of the nitrate companies in Chile.

Q And then did you succeed Mr. Ware as president?

A Then later on, Ware resigned to become president of the International Minerals, and then I became President.

Q In what year did you become president of United Electric?

A 1939.

Q And you continued on the Board?

A Yes.

[10] Q And how long did you continue as president of United Electric, Mr. Kolbe?

A Until 1959.

Q And after that, what was your position with United Electric, if anything?

A Oh, I was Chairman of the Board for two or three years.

Q And do you recall when you resigned as Chairman of the Board?

A I think in '62. It will all appear in the minutes.

Q Mr. Kolbe, could you give us a little background on United Electric, when it was founded, if you know?

A It was formed in 1919 as a consolidation of several properties down in Danville, Illinois, and was not—well, it had its troubles, as did all the strip companies at that time. The machinery simply wasn't there yet, and it had various troubles.

• • • •

[23] Q Can you give us some of the names you do remember?

Did you promote Mr. Morris?

A No. Our sales department was a very fine sales department. We have always had an outstanding sales department. Soule—

Q That's S-o-u-l-e?

A S-o-u-l-e, yes, and Morris, and Tarzy. I always thought they were much superior to anybody else. They were not coal peddlers in the sense that you go from one retail merchant to another, like a milk man, and pick up an order, but they were real sales vice presidents.

Would you like an illustration?

Q Well, yes, that would be fine.

A Well, for instance, Johnny Morris, we wanted to sell coal to Northern States Power and Light—

Q That's in Minnespolis?

A Minneapolis. We figured out that we could make them a price shipping it by barge up there that would be better for them than bringing [24] it up the Lakes.

• • • •

[31] Q Mr. Kolbe, I now show you what has been marked as Kolbe Deposition Exhibit 2, for identification, and I ask you, Mr. Kolbe, if you can [32] identify this document?

A Yes.

Q And what is it, Mr. Kolbe?

A It is the United Electric Coal Companies' 1956 Annual Report.

Q Mr. Kolbe, I ask you to examine that document, and I ask if you are familiar with it?

A Yes.

Q And have you had an opportunity to examine it in recent days?

A Yes.

Q Mr. Kolbe, is the document which has been marked as Kolbe Deposition Exhibit 2 accurate?

A Yes.

MR. CUSACK: I ask counsel if the standing stipulation applies to Kolbe Deposition Exhibit 2.

MR. HEDLUND: It does.

MR. CUSACK: Thank you.

THE WITNESS: I brought Clovis on the Board, too, and Ames.

MR. HEDLUND: I object to that as not responsive.

• • • •

[59] A Yes.—We earned that, those figures.

One year here, as a matter of fact, in '64, we earned $5.16, and that's before this 72 [60] cents, which would have made it $5.88, and, as a matter of fact, the 72 cents may be low, for all I know.

Q I see.

A So we way exceeded these figures.

Q As set forth on 9-C?

A Yes, yes. I might say it was really a tragedy for our stockholders that this merger with Crown—with Truax didn't go through. We would have gotten—well, today, on the basis that I mentioned, of 1.45 shares of Truax for ours, we would have gotten—our stock today would have been worth a hundred dollars. It was a tragedy that it didn't go through.

MR. HEDLUND: I move to strike that testimony as not being responsive.

BY MR. CUSACK:

Q Mr. Kolbe, I would like to go through some of the annual reports of United Electric with you for a moment and ask if you can comment thereon.

• • • •

[74] Q Of old shovels?

A Yes. The bottom half of a shovel costs about as much as the top. So, this is a very substantial saving in capital costs.

Q Could you describe, Mr. Kolbe, for us—excuse me, please. Strike that.

Are there any other advantages, Mr. Kolbe?

A Yes. You can carry a wider pit, too, with a wheel, which has its advantages, because you are running trucks down through there all the time, and you have a wider pit to run those shovels.

Another advantage is that your first spoil bank is a shovel spoil bank and not too high. Then your wheel spoil is put way back, with the result that you don't have this soft material coming down into the pit.

You see, a lot of this dirt and so forth can run almost like water.

Q Is that a serious problem in strip mining, that the spoil bank flows into the pit?

A Oh, yes. We had a lot of that trouble at Buckheart and even in low overburden there.

You see, this coal was originally the bottom of a lake, and then various layers of sedi- [75] ment were deposited on top of it, and some of that sediment can be filled with vegetable matter, and it just can rot, and also, if you have sand, you see, wet sand, it will run almost like water.

* * * *

[78]

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION, DEFENDANT

Friday, October 11, 1968,
10:00 o'clock a.m.

Parties met pursuant to adjournment.

PRESENT:

MR. EISEN,
MR. CUSACK,
MR. FUTTERMAN,
MR. SIMS,
appeared for plaintiff;

MR. HEDLUND,
MR. KEMPF,
appeared for defendants.

ALSO PRESENT:

MR. FRANK NUGENT,
MR. J. MICHAEL McGUINN.

(The taking of the deposition of FRANK FREDERICK KOLBE was resumed in Room 2634, 219 South Dearborn Street, Chicago, Illinois, as follows:)

---

* * * *

[83] Q Are you a member of any other trade associations or an officer of any other trade associations?

A I was a director and a vice-president—I can't remember if I was also Secretary—of the Chicago Association of—what the heck is the name of that?

Q Of Commerce and Industry?

A Of Commerce and Industry, yes. When I ceased being a director, I was made a member of the Senior Council.

Q Were you a member, Mr. Kolbe, of the Midwest—

A I can still go to all their directors' meetings, but I can't vote. I can talk, but I can't vote.

Q Were you also a member of the Midwest Coal Producers Institute, Mr. Kolbe?

A Yes.

Q Were you a member of the Illinois Coal Producers Association?

A Yes, I was.

Q Mr. Kolbe, yesterday you testified in regard to the development of unimite.

[84] A Yes.

Q Who discovered unimite?

A I did. I got a patent not on it specifically, but on a method of packaging and so forth.

Q On a process?

A Well, it was a container. The duPont Company—I turned it over to the corporation and the duPont Company paid the corporation $20,000 for the patent.

Q Thank you.

Now, before, Mr. Kolbe, we return to your testimony regarding the Kolbe Wheel Excavator, could you please tell us who were the competitors of United Electric during the time that you were a director and an officer of United Electric?

A Well, everyone who sold coal to the same people we did was a competitor, and a number of people who didn't.

Q Can you give us the names of these companies, sir?

A Well, I would start out with Truax-Traer. Harrison Eiteljorg had a little mine out there that I have forgotten the name of.

[85] Then, of course, there was Peabody and also Freeman, and there were just any number of them.

Q Was Ayrshire a competitor of United Electric?

A Oh, yes.

Q Was Stonefort a competitor of United Electric?

A I think so. Yes, they had a mine in Fulton County. They would be competitors of ours, yes.

Q Thank you.

A You could get that better, probably, from Mr. Morris, who actually was fighting with all of these people all the time.

* * * *

[96] Q Do you consider, Mr. Kolbe, the wheel a very important development for the success of United Electric, that is, contributing to the success of United Electric?

A Oh, enormously. How in the dickens would we have mined a hundred feet of overburden without it in Cuba, or 85 feet, and made money? Cuba has been a very, very successful mine.

Q With high overburden?

A With high overburden, and the Buckheart mine, the overburden there would just swish out on you, and we were able to put it back so that it obviated that.

Q Mr. Kolbe, do you have an opinion on the capabilities of a wheel excavator regarding the moving of overburden, do you have an opinion as to what is the most overburden a wheel excavator is capable of moving?

A In Germany they move up to 300 feet. I don't know.

Q Of overburden?

A Of overburden. They handle it differently than we do. They finally have to load it into railroad cars and transport it away, but it digs [97] up to 350 feet.

* * * *

[118] BY MR. CUSACK:

Q Mr. Kolbe, do you know whether other mining companies had looked at the Banner mine property prior to United Electric acquiring this property?

A Yes.

Q Do you know which companies looked at it?

A Ayrshire, Truax, Sherwood.

Q Is that Sam Sherwood?

A Yes.

Q Did United Electric obtain the Banner mine property after Ayrshire, Truax and Sherwood had looked at it?

A Yes. The options originally, I think, were owned by maybe Swallow—I have forgotten his first name—down in Danville, and he peddled them around.

Q Do you know whether Ayrshire turned down the Banner mine property as a new mining property?

A They all three turned it down.

Q All three turned it down before United Electric acquired this property?

A That is right, that is right.

* * * * *

[125] Q You testified, Mr. Kolbe, regarding the Cuba mine, the Buckheart mine, the Fidelity mine, the Buffalo Creek mine, the Rushville mine and— [126] what was the name of that mine near St. Louis?

A Freeburg.

Q —and the Freeburg mine.

A Yes.

Q Did United Electric operate any other mines while you were chief executive officer of United Electric?

A Yes. We opened up the Mary Moore mine near Danville and the Skyline mine near Charleston, West Virginia.

Q Mr. Kolbe, did United Electric ever operate an underground mine?

A Oh, we had a small operation at Buffalo Creek.

Q A small underground operation?

A Yes.

Q Could you explain how United Electric got into the underground mining business at Buffalo Creek?

A We had two advantages. In the first place, we had a washing plant that was built for the strip mine, so we would have no additional cost of constructing a washing plant or preparation plant.

Q Was that a strip mine at Buffalo Creek?

[127] A Right.

Q All right.

A Next, we would not have to put down a shaft because we could go right in from the last cut of the strip operation.

We also had a man down there, whose family had owned and he had operated a deep mine up in Fulton County, a small operation.

Q An underground mine?

A An underground mine. With all of those factors, we thought we could do something down there.

Q How long was this underground mine at Buffalo Creek in operation by United Electric, do you recall?

A I can't tell you any more. I don't remember.

Q Mr. Kolbe, one of the contentions of the defendants in this lawsuit, and Mr. Hedlund will correct me if I am wrong—

MR. HEDLUND: I may object already, but continue.

BY MR. CUSACK:

Q (Continuing) —is that United Electric [128] does not have the capability of engaging in underground mining. Do you believe this is a fact, sir?

A First of all, I am not sure that the underground mining companies do.

Q Do you believe, Mr. Kolbe, that United Electric has the capability of opening an underground mine if it so desires?

A Oh, yes. We could do it, yes, but I would just like to say that this is a very difficult job.

The underground mining companies in 1923 turned out eighty-one million tons of coal. Thirty years later, in Illinois, they turned out a little over twenty.

In other words, there was sixty million tons production of companies that went out of business because of fires, roof falls and bankruptcies. It is a tough business, it is a tough business, and we would have to be very—any organization would have to be very, very careful going into the underground mining business.

Q Do you believe, Mr. Kolbe, that United Electric would be able to go into the underground mining business and be able to go into it success- [129] fully, under your management?

A Yes, but it is a big job. It is a big job. It depends on a lot of things.

[130] Q Do you believe, Mr. Kolbe, that United Electric at the present time, with proper management, could go into the underground mining business?

A Well, sure, with proper management. It also would depend on picking up, of course, the proper reserves, on an increase in the price of coal, and how do you know where nuclear power—is nuclear power going to provide a ceiling on this coal?

This underground business is a tough business; it is a tough business.

MR. CUSACK: Mr. Youker, will you please mark this document as Kolbe Deposition Exhibit 12 for identification, being a letter dated February 27, 1957, to Mr. W. D. Hillery.

(The document was thereupon marked Kolbe Deposition Exhibit 12 for identification, 10-11-68.)

* * * *

[133] BY MR. CUSACK:

Q Mr. Kolbe, would you please examine Kolbe Deposition Exhibit 13 for identification.

A Yes.

Q Can you tell us whether United Electric, during the period of time when you were a chief executive officer, often did look at underground properties with a view to the possibility of mining these properties?

A Well, we looked at them but we never did anything much about them. During—

Q Mr. Kolbe, is it your—

MR. HEDLUND: Perhaps, Mr. Cusack, you should let Mr. Kolbe finish his answer.

BY MR. CUSACK:

Q Do you have anything more to say in answer to that question, Mr. Kolbe?

A During these years we had two problems that would prevent us from going into something completely new like this.

One was our financial situation. We always needed more equipment and we needed money for various things. To have gone into something [134] completely new would have absorbed that money. We didn't have it.

Now, in the '60's when the corporation began to throw off substantial amounts, the situation would be different, but in the '50's, no.

Secondly, I felt the deep coal business would need a considerable degree of creativity. For instance, and I just took these figures down from the Crown mine, in 1967 they turned out 3,066,000 tons from this report here (indicating).

Q You are referring to the 1967 Annual Coal, Oil and Gas Report of the Department of Mines and Minerals of the State of Illinois?

A Right.

Q All right.

A They had 577 men. That is 5,000 tons a man, roughly. We would get two or three times that output per man.

Q That is, the United Electric mines?

A Yes. So you can judge that these labor costs in these deep mines is too much.

As a matter of fact, years before I had looked into the matter of this—oh, this long [135] wall mining in Germany, John Huey who was in Germany, I asked him to investigate it—

Q How do you spell that, sir?

A H-u-e-y.

Q Yes.

A It is a plow method, and it was subsequently used in this country, but I mean, these deep mines, as I say, would involve a measure of creativity on my part that I was not able at that time, I felt, to deliver, and I did not care to go into a business which I felt needed so much creativity as that deep coal would.

When you get into one of these things, you do not know in the beginning what you might run into. I could give you a number of illustrations of people who got into things that they did not know about underground.

A friend of mine, Mesham, down in Kentucky had three fine mines—has three mines.

I said, "How did you get these mines?" He said that the big companies that developed them just couldn't make any money out of them, so he took them over.

Maybe he runs them non-union, I don't [137] know, on a lower wage scale or something, I don't know how he runs them, but anyway, they were all failures from the standpoint of the big companies.

* * * *

[158] Q Could you tell us about it, please, sir?

A Well, we acquired a great deal of the coal up there, up to 100 feet.

This land, of course, is expensive land. I do not know the top price that we paid on it, but I remember one piece that we got into a bidding contest with the farmer adjoining it, and this farmer wanted to pay $700 an acre for that land, just for farm land. It was very good farm land.

We stopped, though, at about a hundred feet, as I remember it, and didn't go above that.

You see, your strip coal differs from deep coal in that you have to buy the surface and it is hard to really make a good return on that surface land.

You have got a lot of money tied up for a long time. If we paid, for instance, $700 an acre, and we would have to pay more than the farmers because we would have to out bid them, that would be eleven or twelve cents a ton, in fact it would be more than that, because your coal is not solid in the field oftentimes. You might have to buy a 200 acre farm and get only 50 acres of coal on it, or something like that.

[159] You pay ten cents a ton now and in ten years, at seven per cent, it would be twenty cents, and in twenty years it would be forty cents, and in thirty years it would be eighty cents. Your compound interest really eats you up.

Q Mr. Kolbe, do you know whether or not, or do you believe that there are strip coal reserves in the Canton area between 100 to 170 feet of cover which could conceivably be strip mined?

MR. HEDLUND: You mean as a practical matter, Mr. Cusack?

MR. CUSACK: Yes.

MR. HEDLUND: I mean, as a physical practical matter. I am objecting to the question. I do not think it is properly phrased. It cannot be understood.

BY MR. CUSACK:

Q Do you understand the question, Mr. Kolbe?

A Yes.

Q Would you please answer it, sir.

A You would have to look at this question, I think, from my whole experience in the coal business.

You see, when I got into it in 1939, [160] really, in the Cuba mine, I do not think anybody would have bought that Cuba Field that we went into. Ware did not want to have anything to do with it. It was next door to Truax and Truax didn't buy it.

80 feet of overburden was just too much overburden, and similarly 100 feet later on would have been. I stopped at 100, you see there, in 1957, but now I just don't quite know what I could do.

It is a matter of creativity. It is also a matter of what the deep mines can do.

I believe, for instance, that certain of these deep mines are losing money. If they are losing money, the price of coal has got to go up and that has something to do with my opinion on it.

Furthermore, Truax-Traer has a limited life there in Fulton County, we have a limited life at Banner and at Cuba and Buckheart, and it might well be practical to mine much deeper overburden than we had originally thought.

There is also the advance in explosives and the advance in drills, and every year these [161] machines get bigger and better, the wheels get bigger and better—or get better, and the deep mines, I would want to know what they could do.

* * * *

[164] A They were all those for which I could get published reports—I would like to change that. Any reports. Not only published, but any. These are all published reports, from published reports.

Q Thank you, sir.

Mr. Kolbe, do you know the present name of the West Kentucky Coal Company?

A That may still be their name. They were taken over by Island Creek, but whether they dissolved the original company or not, I don't know.

Q Is West Kentucky Coal Company a subsidiary of Island Creek Coal?

A It is now.

Q Mr. Kolbe, are the above coal producers, that is, the ones you have listed in Kolbe Deposition Exhibit 16-C as Ayrshire, Old Ben, Peabody, United Electric, Truax-Traer, West Kentucky and Zeigler, are those companies in competition?

A Yes. Yes, I think so. Generally, yes.

MR. HEDLUND: I am sorry. I did not hear your answer.

[165] BY THE WITNESS:

A Yes.

BY MR. CUSACK:

Q Based on your knowledge and experience, Mr. Kolbe, is Freeman also a competitor of these above firms?

A Yes.

Q Can you give us generally, Mr. Kolbe, why these firms are in competition, your reasons for it?

A They are in the same territory and at least some of their coals can be used for comparable purposes.

Old Ben, however, would have some coal that we could not compete with, metallurgical coal and so forth.

Q Mr. Kolbe, I would like to show you what has been marked as Camicia Deposition Exhibit No. 1, which is entitled, "Keystone's Map of the Coal Fields of the United States," published by the Keystone Coal

Buyers' Manual, and I ask you, sir, to please examine this exhibit.

A Yes.

* * * *

[168] Q Do you know whether any of that coal comes in there now?

A Peabody had some mines, but I cannot remember whether the mines have worked out or not.

Q Thank you, Mr. Kolbe.

Are there trade associations whose membership is limited to coal producers?

A Oh, yes. National Coal, National Coal Policy, Midwest Coal Producers.

Q Mr. Kolbe, are there any labor unions whose memberships are limited to employees of coal producers?

A United Mine Workers, and Progressive Mine Workers, I think is still in existence.

Q Mr. Kolbe, do you know if there are any commercial publications which only cover the coal industry?

A There are a great number of them, yes.

Q Could you name a few for us, please?

A Coal Age, and Saward's, which is limited, I think, to export coal.

Q Is that S-a-w-a-r-d's?

A Yes.

[169] Q All right.

A There is also Black Diamond. There are a number of them.

Q Mr. Kolbe, based on your knowledge and experience, what fuel, if any, dominates the steam electric utility market in Illinois and surrounding states?

A Well, coal.

Q Can you give us the reason for this, sir, if you know?

A The low cost.

Q Mr. Kolbe, on a year-around basis, have coal prices been considerably lower, considerably higher, or about the same as firm gas prices for electrical generation?

A Oh, they are lower, much lower.

Q What would your answer to that be in regard to firm oil prices?

A Well, oil used to sell for $2.00 a barrel in the east, I have forgotten what it sold for out here, and it takes four barrels or more to make a ton of coal, to give you the same heat value, so that is $8.00 a ton.

We sold coal to our—to the utilities [170] at a delivered price maybe of $5.00.

Oil was way out. I don't know of any utility that burned oil out here in this district as a regular proposition. They might burn it during a strike or something, but it was way out of our—

Q What about natural gas?

A Well, natural gas was sold only as an excess proposition. I mean, in the summer the natural gas would be dumped here.

They would sell it to the customer in the winter at $1.00 for a thousand cubic feet. They would sell it to—our price on coal might be 25 cents for the same amount of heat value, so they would reduce their prices down to that, so of course there is no sense in selling a commodity that is worth a dollar actually for 25 cents, so they just did it because they had the pipelines and didn't have to charge anything for that, or the overheads, and furthermore, they very often had contracts with the land owners that required that they keep this gas flowing out of the wells.

* * * *

[189] MR. HEDLUND: I am sorry. Who was receptive, Mr. Kolbe, to that idea?

BY THE WITNESS:

A The Ayrshire Collieries.

BY MR. CUSACK:

Q Continue, please, Mr. Kolbe.

A But the Aluminum Corporation wanted even more than that, so therefore we informed them about these large reserves of underground coal to the north of us.

Q That is the Beaucoup field?

A The Beaucoup Field. We said we did not care to tie up money that would not be—for coal fields that

might never be mined, and certainly would not be mined for a long time in the future, but they said they would. Their position, of course, was different.

So we agreed to acquire coal fields up there for them that we would mine at some future date. We had no contract to mine it, but we would establish, as we have in many other things, a reputation for knowing our business and so forth, and if it seemed advisable to us at the time, we would mine it for them.

* * * *

[199] Q Mr. Kolbe, can you tell us when United [200] Electric started to acquire coal reserves at the Round Prairie Field?

A I would have to look at the record on that. I just don't remember those details.

Q Mr. Kolbe, Kolbe Deposition Exhibits 32-A, 32-B and 32-C refer to what coal field, sir?

A It is a coal field north of the Fidelity mine, separated from it by the Beaucoup Creek Field north of there.

Q Do you know the name of the field, sir?

A Round Prairie.

Q Thank you, Mr. Kolbe.

Are the coal reserves that United Electric acquired—excuse me. Strike that, please.

Mr. Kolbe, do you know whether United Electric acquired coal reserves at the Round Prairie Field?

A I just don't remember all that. I just don't.

MR. CUSACK: Will counsel stipulate that United Electric acquired coal reserves at the Round Prairie Field?

* * * *

[203] Q Mr. Kolbe, who was the president and chief executive officer of United Electric at the time United Electric began to acquire underground reserves at Round Prairie?

A I think Morris was. Wasn't he president? I think so. Not me.

Q Mr. Kolbe, why did United Electric, if you know, acquire underground reserves at Round Prairie?

A Well, just for the reason given there, that we have confidence in the coal business and would want to continue our life beyond the life of the strip coal reserves.

Q And these were underground reserves, sir?

A These were underground reserves.

Q Who was it contemplated, Mr. Kolbe, if you know, would mine these reserves?

A We would.

Q United Electric?

A Yes.

* * * *

[207] Q Assuming you could not buy any more strip reserves, what would you do if you were running United Electric?

A I would look into the deep coal. I must say that I would be a little hesitant. I would be very, very careful about it, because I don't believe, for instance, that Freeman makes any substantial amount of money.

I think they are probably good operators. If people like that can't make money, why do you rush into a business like that?

Old Ben, which I think is a very well-run company, last year earned 35 cents a ton before taxes. That's no sort of profit to make.

Q Mr. Kolbe, do you believe—

A I would have had ideas, as a matter of fact, on different ways of deep coal mining, just like I did in strip coal mining. I might have revolutionized the whole thing.

Q As you did with the Wheel Excavator and with Unimite on stripping?

A Yes, yes, drills and one thing and another.

[208] Q All right.

A I also was instrumental in getting the deep coal field into metallurgical coal. I mean, all of these things.

Q Mr. Kolbe, do you feel that United Electric could mine the Round Prairie Field?

MR. HEDLUND: That has been asked and answered, hasn't it, Counsel?

MR. CUSACK: Yes, I assume it has. Thank you.

BY MR. CUSACK:

Q Mr. Kolbe, have you ever heard of the Industry Field?

A Yes.

Q Can you tell us generally where it is located?

A It is located west and south of the Buckheart Mine.

Q Is that in McDonough and Schuyler Counties?

A Yes.

* * * *

[230] Q Thank you.

Now, Mr. Kolbe, based on your experience, when United Electric would open up a strip mine, as the mine was mined through the years, would the mine have more reserves than originally was estimated, or less reserves than was originally estimated?

A I don't recall any mine that we ever had that wouldn't have more, because in the first place, with the development of machinery and methods over the years, you could mine stuff that you didn't know you could mine in the beginning.

Also, you would start out with certain reserves. There would be land around it which you wouldn't know, of course, whether it had coal in it or not, but as it developed, it would have.

You wouldn't drill at the beginning, because you wouldn't want to put the money into it. For instance, when Buckheart was started, Ware had nine million tons, 600,000 tons, a 600,000 ton mine per year, which would be fifteen years. He didn't know that he had—he didn't [231] definitely know that there was any more coal around there, but actually that mine now has been mining 30 years, and got 600,000 tons a year, which would be eighteen million tons or twice the original reserves, but I think they mined a million and a half or two million tons per year, so I mean, it is way in excess of what he thought he had at the beginning—or what he knew he had at the beginning, and you wouldn't drill all of this surrounding land, because if you drilled it, the farmer would know that he had coal and he would

go to another coal company and say, "Look: There's coal here, with so much overburden. I will sell it to you."

Well, what are you going to do? You are going to buy it. Your hand is forced, and you don't want that to happen.

So I don't know of any mine that did not have more reserves than were originally figured on.

Q Thank you, Mr. Kolbe.

Now, Mr. Kolbe, do you feel that the management of United Electric was dilatory on not acquiring more strip coal reserves?

[232] A After I left?

Q No. While you were there, sir.

A No. We were not dilatory, because we had other uses for—we had—when you have—put it this way: We always had to regulate our purchases by our pocketbook.

This company was in receivership in the 1930's, practically, Ayrshire was in receivership and other mines were practically in receivership.

The coal business was also a roller-coaster business. When the diesel locomotive came in and the householder went to oil and gas, we lost about half our business. We were on a rollercoaster, and a lot of people got thrown off at those turns. You had to watch your financial position as well as what you would like to have done. Now, after I got out, I think they have been very dilatory.

* * * *

[237] BY THE WITNESS:

A Well, I can make the comparison out of my mind.

MR. HEDLUND: Just so the record is clear.

BY MR. CUSACK:

Q Do you want to have the question read, Mr. Kolbe?

A They have $8,000,000 of cash and no bank debt. We always usually had a great deal of bank debt. This is a wholly different situation.

What I wanted to do—for instance, we evolved a way of transferring heat, and I tried to get a patent on it, although we couldn't get it, but I might say that the

method now is used by the German outfit—three or four companies, in fact, who are building an atomic energy plant, and I understand they are using our method of heat transfer of that, although I had no idea of getting into atomic energy, but it is a way of transferring heat that I think works very well, works better than this method they use—that General Electric and the other people use.

[238] The Hanna Coal Company—the Hanna Company want to put in an oil recovery process from shale, and they are still trying to get government permits that would use this process to get the oil out of the shale.

The Sun Oil Company have made a big investment in the tar sands of Athabeska. They are not using our process for separating the oil from the sand, or the tar from the sand, but the Hanna Company would use our process.

Now, I would have liked to have investigated the possibility of using our process on those tar sands. If we had been in a cash position so we could have done these things, so we would have had enough cash to follow up on them, we would have done some of them.

Furthermore, the A. O. Smith Company back in the early 1930's went into gold mining out in Nevada, where the gold occurs in very, very small pieces, you can only see it under a microscope.

They were going to mine this deposit, open pit mining. We are experts on open pit mining.

[239] Q United Electric?

A United Electric.

Q Yes.

A I would have looked into that. I notice now there is a mine in Nevada doing this, and doing very well, apparently. It was described in the May issue of National Geographic.

I mean, with a company with money and with expertise, the world is the limit.

Q What about coal reserves, Mr. Kolbe?

A We would have acquired those coal reserves north of Canton, the coal reserves over here in Vermilion County, had they still been available, and also those in—

we would have drilled much more extensively out in—

Q Industry?

A Industry, sure. The world, the sky is the limit.

MR. CUSACK: Thank you very much, Mr. Kolbe. We have no further questions at this time. There is a possibility, however, that we might have one or two more questions tomorrow.

* * * *

[242]

No. 67 C 1682.

UNITED STATES OF AMERICA, PLAINTIFF,

vs.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION, DEFENDANTS.

Thursday, October 17, 1968,
10:00 o'clock a.m.

Parties met pursuant to adjournment.

PRESENT:

MR. EISEN,
MR. CUSACK,
MR. FUTTERMAN,
MR. SIMS,
appeared for plaintiff;

MR. HEDLUND,
MR. KEMPF,
appeared for defendants.

ALSO PRESENT:

MR. FRANK NUGENT,
MR. J. MICHAEL McGUINN.

(The taking of the deposition of FRANK FREDERICK KOLBE was resumed in Room 2634, 219 South Dearborn Street, Chicago, Illinois, as follows:)

---

* * * *

[298] Q At this luncheon, Mr. Kolbe, do you recall telling Mr. Chaffetz and me that while you had been president of United Electric you had been very reluctant to undertake underground mining?

A That is my position, and I might well have told you that.

Q Do you recall telling us, in connection with that, that during the 1950's you had been too old to undertake such a new venture?

A No, no. Let's see. How old was I in the 1950's? I was between 60 and 70.

I would be hesitant about it, because George Harrington tried it and couldn't finish it.

Q Who was George Harrington?

A He was president of the Chicago, Wilmington & Franklin, and got himself into a mess, partly through age, and Freeman Coal Company picked up his properties.

Q Thank you.

A At a low price.

* * * *

[300] Q We will get to that. I would like to have you—

A Because any one year would not be so decisive as you might think it was.

Q I understand that. I again pose the question, sir: Do you recall, obviously without access to the records at the moment, whether between 1945 and 1950 United Electric materially improved its reserve position?

A No. I would not know the exact years in which we did it, and you really should have an understanding of the strip coal reserves.

Q Yes, sir.

A Which you will bring out later, you say.

Q Yes, sir.

A O. K.

Q Do you recall, getting back to the luncheon with Mr. Chaffetz and myself, telling us that United Electric's failure to materially improve its reserve position between 1945 and 1950 was because of the following factors: First, that United Electric had 30 years of [301] reserves at that time; secondly, that it was in a poor cash position; and third, that it had been your judgment at that time that UEC could not afford the substantial investment that would have been involved in view of the

fact that the investment could not be recovered until a long period of time had passed?

That is a long question, Mr. Kolbe. Would you like the reporter to read it?

A No.

Q My question is, do you recall saying that to Mr. Chaffetz and me at that luncheon?

[302] A Yes. I think I would have said that, because that is my position.

Q Thank you, sir.

A I should—

Q Well, sir—

MR. CUSACK: Just a moment, please. I do not think he has finished the answer to the question—

THE WITNESS: These things are not complete.

MR. CUSACK: —and I think he should be given the opportunity to finish his answer.

MR. HEDLUND: He has answered the question. The question asked for a yes or no answer, and he said yes.

MR. CUSACK: Mr. Kolbe—

MR. HEDLUND: If he has a further explanation, Mr. Cusack, this is your witness and you can bring it out on direct.

MR. EISEN: I think the witness should be permitted to answer the question fully.

MR. HEDLUND: It is not the function—

• • • •

[303] MR. HEDLUND: No. I am sorry, Mr. Cusack. This is my deposition and I intend [304] to conduct it the way I wish to and according to the rules.

MR. EISEN: In that case, we are going to move that the question and answer be stricken.

MR. HEDLUND: Fine.

MR. EISEN: The witness not having had an opportunity to complete his answer.

MR. HEDLUND: I am certain Mr. Cusack will give him ample opportunity to complete his answer on that particular question on redirect.

BY MR. HEDLUND:

Q Again at this luncheon, Mr. Kolbe, do you recall telling Mr. Chaffetz and me that in your opinion nuclear energy poses a severe threat to the coal industry—

A Yes.

Q —and that—I am sorry?

A Again, that is my position, that it does.

Q Very well.

• • • •

[305] Q Do you recall discussing this subject with Mr. Chaffetz and me?

[306] A I would agree with that statement, but not with the "no one", and I think it should be further—for instance, if you had a lot of machinery and you were at the end of the life of a particular mine, you would open a new mine with that machinery.

Now, whether you would—in general, I do not think you would put ten or twenty million dollars into a property if you did not have a long term contract in general.

Now, if you already had the equipment, if it did not cost you much to move over there, if you had an unusually favorable cost figure so that you knew you could get the business in the future, take it away from somebody else, all of those things bear on the matter. You state the position too narrowly.

MR. HEDLUND: Thank you, sir.

BY THE WITNESS:

A Which is my objection to previous questions.

• • • •

[316] Q What was the purpose of this letter?

[317] A We were talking about a possible merger between ourselves and Truax. The Crown interests controlled a third or more of our stock, and I think a merger would require a two-thirds vote maybe, so they had to be consulted, and were really the key figures,

you might say, or would be a key figure in it, and I didn't want them to have—I wanted them to have a true idea of the relative value of these properties.

Q By "them", you meant the Crown interests?

A The Crown interests, that is right.

Q At this time was Mr. Henry Crown or any of the Crown interests directly involved in your negotiations with Truax?

A (No answer.)

Q By "directly involved", I mean present at meetings with Truax people or conducting conversations with them.

A I would not know that, because they might well talk with the Truax people and not have me there.

Q The negotiations were going on at this time, though, is that correct? This is October, 1956.

* * * *

[320] Q Why did you think that this was not a [321] particularly good place to have reserves?

A I think the coal there sold for a little less than it did in Fulton County, and there is a very bad competitive situation.

The deep mines had better coal—they were located in that same area and they had better coal. There was a lot of rock in that area and so forth.

Q Is it your recollection that there were deep mines at that time over near St. Louis?

A I think Lumaghi Mine was over there, but in any case, I had more reference to the—I would think more of the mines that are a little east of the Fidelity Mine.

Q Over in—

A Waltonville, and one thing and another, Orient, Old Ben, and so forth.

Q In the third paragraph of Kolbe Deposition Exhibit 9-A, the first sentence states:

> "More of the benefits would come from the Truax properties than from our own."

* * * *

[337] FRANK FREDERICK KOLBE,

called as a witness by the plaintiff herein, having been previously duly sworn, was further examined upon oral interrogatories and he did thereupon depose and testify further as follows:

CROSS EXAMINATION

(continued:)

BY MR. HEDLUND:

Q Mr. Kolbe, when you and I met, I believe it was last week or the week before that, do you recall telling me that you had nothing to do with the sales of United Electric during the 1950's?

A Very little.

MR. HEDLUND: Would you hand the witness Kolbe Deposition Exhibit 9-A, 9-B and 9-C, please, Mr. Cusack?

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

MR. CUSACK: I have handed him the exhibit, Mr. Hedlund.

• • • •

[357] Q This page states in part:

"For the present fiscal year ending July 31, 1957, it is estimated that United Electric's earnings will be as follows: . . ."

Then at the bottom of the page, following a number of figures and entries, there is the item, "Net income per share on 677,920 shares", and after that legend the figure of $3.62.

In the light of that, Mr. Kolbe, does that refresh your recollection as to when you believed, in writing the letter to Mr. Crown, that United Electric was going to earn $3.50 to $4.00 a share?

A Yes. It would appear that they would earn it for the fiscal year ended July 31, 1957.

Q In point of fact, Mr. Kolbe, the company earned $3.02 a share that year, is that not correct?

A $3.02, yes.

Q Would you please turn to the next page, that is, the second page 2 of Kolbe Deposition Exhibit A.

[358] A Yes.

Q It is stated in this document, at the bottom:

> "At the end of the present fiscal year United Electric's working capital could be over $5,000,000 . . ."

A Yes.

Q At the end of that fiscal year, Mr. Kolbe, what was United Electric's working capital?

A $3,438,544.

Q It is a fact, is it not, Mr. Kolbe, that United Electric did not achieve working capital in the amount of $5,000,000 until 1964?

A I would not know.

MR. HEDLUND: Would counsel please hand Mr. Kolbe the 1965 annual report of The United Electric Coal Companies to refresh Mr. Kolbe's recollection.

MR. CUSACK: Yes.

* * * *

[367] Q With whom were you negotiating at that time?

A There were some brokers down in Indianapolis, either at that time or later, and I think there were other people who had done the same thing. I think that a chap by the name of Brooke was also involved. He had done the same sort of thing for the Little Sister Mine.

Q Were the brokers in Indianapolis acting as principals or as agents for others?

A No. They were acting as agents.

Q Did you know for which principals they were agents?

A They mentioned Mr. Eitelgeorge. I am not sure that would refer specifically to this time, to this deal. Brooke operated through the Continental Bank, I believe.

Q This deal never went through, did it, Mr. Kolbe?

A No. In addition to the—do you want to know the further advantages of this deal?

* * * *

[371] Q In point of fact, Mr. Kolbe, it is true, is it not, that without regard to the Banner Mine, United Electric did not produce 4,500,000 tons a year until the year 1964?

A I have already pointed out that we may have diverted some of the Cuba and Buckheart coal to Banner, and that is really—that in making my statement, I had in mind that Cuba and Buckheart would keep all their business and not be diverted.

Q Of course, you said that you do not know whether or not it was. If it was not so diverted, it is true, is it not, that without regard to Banner, United Electric did not produce 4,500,000 tons a year until the year 1964?

MR. CUSACK: I object, Counsel, to the speculative question.

MR. HEDLUND: You may answer, Mr. Kolbe.

MR. CUSACK: Do you understand it, Mr. Kolbe?

BY THE WITNESS:

A Yes. I do not think it gives a very [372] —the picture, though. I don't think so.

* * * *

[374] Q Could you tell me something of the circumstances under which Mr. Lamm left the company?

A We had drilled a property over in Ohio which Arnold thought highly of and—

Q I am sorry. Was that the Sunny Hill Coal Mine?

A That was the Sunny Hill, yes. I was not as enthusiastic about it as he was, but also we had to buy new equipment at Fidelity and we had lots of need for funds at our present mines, so I did not believe that we should become involved further over there at that time.

So he left the company and formed a company with several other people, and they went ahead and mined it.

Also, it was an opportunity, and if they were successful they would have—if they were successful, they would

possibly make a great deal of money, and they possibly might not.

Q I gather that Mr. Lamm disagreed with you as to the wisdom of acquiring this property.

A He did.

[375] Q Did he also disagree with you as to the policy of the company at that time toward reserves, other than the Sunny Hill Mine specifically?

A I should here distinguish between two sections of reserves. We never disagreed on building up reserves on our then mines, and I might say that we have never lost any significant reserves at those mines.

I mean, everything that could be mined through the washing plant at those mines has either been mined or was acquired. We never disagreed on that.

Arnold, however, was much—he was more expansion-minded than I was.

Q Is it fair to say, and I am asking you if it is fair to say, that one of the principal reasons Mr. Lamm left was a disagreement between you and him as to United Electric's reserve policy in general at that time?

A On the opening of new mines it might have been. I do not know that. I know that he saw this opportunity and took it.

* * * *

[400] MR. CUSACK: That is at Page 5 of the 1952 annual report.

THE WITNESS: Yes.

MR. CUSACK: The preceding sentence to the paragraph Mr. Kolbe just read.

BY MR. HEDLUND:

Q I would like to now show you, Mr. Kolbe, a copy of the 1954 annual report and direct your attention to Page 6, the second paragraph, and see if that refreshes your recollection as to when that operation was discontinued.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A Yes. It was discontinued before the date of this report, before September 10th, 1954.

BY MR. HEDLUND:

Q Why was it discontinued, Mr. Kolbe, if you recall?
A Because we did not make any money there.
Q It is the fact, is it not, Mr. Kolbe, that you had substantial losses in that operation—
[401] A Yes.
Q —for that period of time?
A Yes, we did.
Q Who was in charge of that operation?
A The Mine Manager, Mr. Bob Donaldson. I think we also got someone else under whose management it was specifically.

I am not sure that Donaldson was not in charge of it when it was put in and we got this other man later. I would not be sure of that.

You see, I think Reid was the Operating Vice President at that time. Let me just see.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A May I see the previous one, the 1953 one, or the 1952 one?

MR. HEDLUND: Certainly.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

[402] BY THE WITNESS:

A Yes. In 1953, Mr. Reid was vice president. It would be under him.

BY MR. HEDLUND:

Q Had Mr. Reid any prior experience in underground mining?

MR. CUSACK: If you know, Mr. Kolbe.

BY THE WITNESS:

A I would not know. I do not remember.

BY MR. HEDLUND:

Q It is a fact, then, is it not, Mr. Koble, that although the 1952 report, as you read into the record, states that, "When this operation", referring to the drift operation, "When this operation is fully developed, it will substantially increase the output of this high premium coal for which there is an excellent demand", in point of fact that never happened?

A We were wrong on it, which I might recall to you is a common happening in the deep coal industry.

Q Why was that, Mr. Kolbe, a failure as an operation?

A I am not sure. I am not sure.

* * * *

[408] Q Thank you.

Do you recall, Mr. Kolbe, whether that predicted tonnage was ever in fact achieved?

A I do not believe it was.

Q Would you tell me the circumstances under which United Electric got involved in the operations of the Skyline Mine?

A The realization of this coal was very high, as I remember, between $5 and $6, and of course, our coal sold for much less than that, so between the realization and the engineering reports, we thought we could make some money down there.

Q Did Island Creek Coal Company come to you with this proposition or did you go to them, if you recall?

A I think I heard about it through Bill Cooke, and we probably went to them first.

Q Is it fair to say, then, that you initiated the negotiations that led to this [409] operation?

A I would say we did.

Q I am speaking of "you" in a personal sense.

A Oh. Yes.

Q If you recall.

A Well, Bill Cooke spoke to me about it, and I took it up, of course, with our Operating and Sales organizations, and we went on from there.

Q Island Creek at that time was mining in the immediate vicinity, were they not?

A Yes.

Q Was there something unusual about the mining conditions with respect to the Skyline Mine?

A This was one of the few strip mines, possibly the only one in that vicinity, so it would have, we hoped—we thought—cost advantages.

Q Was Island Creek not stripping any coal—

A No.

* * * *

[420] (The document was thereupon marked Kolbe Deposition Exhibit B for identification, 10-18-68.)

BY MR. HEDLUND:

Q I now hand you, Mr. Kolbe, what has been marked Kolbe Deposition Exhibit B for identification, and ask you if that refreshes your recollection as to another attempt by United Electric to get into underground operation.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A This says, "In connection with your memorandum of October 8th", which I do not have here. It says:

> "I am sorry that the underground miner did not perform. I believe this method of mining has a great future, but underground mining is not our business, and under the conditions I think the only thing for us to do is to continue to [421] wait until someone in the deep mining field produces a working machine and a workable system."

MR. CUSACK: For the purpose of the record, the memorandum is to Mr. R. J. Hepburn, dated October 9, 1957.

BY MR. HEDLUND:

Q Does that refresh your recollection as to an attempt, in addition to the drift mine at Buffalo Creek by United Electric, to get into underground mining?

A Well, this would be exactly contrary to it, wouldn't it?

> "I think the only thing for us to do is to continue to wait until somebody in the deep mining field produces a working machine and a workable system."

Q Do you recall purchasing the underground miner referred to there?

A Yes. It was for use at Buffalo Creek.

Q Did you participate in the design of the machine?

A No. What happened was that I saw the possibilities of such a machine and the C. W. [422] Neff Company, George Harrington, had worked for, I think, years on the Kinley, McKinley or Kinley machine, and he had had a man by the name of Robbins working on that with them.

At the same time Arnold Lamm was working on the Colmol. There were a lot of people working on this general idea, and I saw where it would make quite a difference in the deep coal field.

None of these machines were too good at that time. I went over and saw the Sunny Hill operation. I was in hopes that we could use it.

We had, I hoped, an advantage in operating an underground mine in that we could go in from our open pit. We would also have a washing plant. It would increase the reserves we could put through that plant, possibly on second shift and so forth.

The strip coal industry has done a lot of work along this line. Peabody built a punch miner utilizing part of this and so forth, and I believe they lost a substantial amount of money on it, but anyway, they did it. It is a [423] logical thing for a strip coal miner to be interested in.

I went over and saw Arnold's machine, went underground, with the possible idea of making a small one. Arnold had that in mind. It didn't strike me.

Then we thought of making a machine similar to the Kinley machine. The Kinley machine I think has been very successful—it has been successful, put it that way, a lot of them have been made, so we engaged this same man, Robbins, with the idea of using this machine at Buffalo Creek.

It never worked out. I cannot tell you just why, but it did not work out. I had nothing to do with the design of it.

Q Did anyone at United Electric have anything to do with the design of this machine?

A Well, it was really under Robbins, whose job it was to produce the small Kinley machine, and we may have drawn up parts for it, our Engineering Department.

Q Was it your idea to get a smaller version of this machine?

[424] A Of the Kinley?

Q Yes.

A I think it probably was. It probably was.

Q Did the machine, to your knowledge, ever mine any coal at Buffalo Creek?

A If it did, it mined not very much.

Q What subsequently became of the machine?

A I imagine it was simply junked.

Q Would it be fair to say that this venture cost the company in excess of $600,000?

A No. I don't think—you mean the whole deep underground mine?

Q I mean the whole business with this machine about which you have been testifying.

A No. I do not think the machine cost that much.

Q That was not really my question. I did not ask you how much the machine cost. I asked whether—

A That is, though, what you did ask.

Q If I did, then, I would like to rephrase the question.

In terms of the initial cost of the [425] machine and any other expenses involved in its use, repair, redesign or design, do you recall whether or not the total expense to the company was in excess of $600,000?

A Just on that one machine?

Q Yes.
A I don't remember, but I wouldn't think so.

• • • •

[448] BY THE WITNESS:

A (Continuing) I just want to say that—after '63, of course, I haven't kept track of developments in the coal business too much—that a new way of shipping coal has come in, which is the unit train, and this new development, of course, could affect this Rail-to-Water. I don't know whether it has or not, but what might have been a good investment in good judgment by these seven coal companies at that time could be changed, of course, by later developments. I don't know whether it has been or not.

The rate on these—on this shuttle service that has been inaugurated is substantially less than the previous rate; in some cases, perhaps half as much.

BY MR. HEDLUND:

Q Mr. Kolbe, do you have Kolbe Deposition Exhibit 13 in front of you, and if so, would you review that once again?

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

[449] BY THE WITNESS:

A Yes.

BY MR. HEDLUND:

Q In the margin, in handwriting, appears the following, under the date of 2-25-57:

"Kolbe says not interested."

Do you recall why you were not interested in this field, if that, in fact, was the case?

A It's a deep mine, in four feet of coal, away from our present operations, and we may have already started thinking about the Banner property, we had other uses for our money. I think there would be a lot of reasons against it.

Q Is it fair to say, Mr. Kolbe, that because this involved underground coal that that was the principal reason why you were not interested?

MR. CUSACK: I think, Counsel, that the witness has answered the question.

BY THE WITNESS:

A It was certainly one factor, one [450] factor and a big factor.

Q This coal was indeed—

A (Continuing) Had it been strip coal, in other words, I think that might have overruled—that would have overruled a lot of other objections.

Q This field was a few miles from your holdings at that time in Oklahoma, was it not, and in that connection I direct your attention to the second paragraph of Kolbe Exhibit 13.

A Yes.

MR. HEDLUND: Counsel, do you have the first volume of the transcript?

MR. CUSACK: Yes.

MR. HEDLUND: If you would provide Mr. Kolbe with that, and I am interested in Page 58.

* * * *

[456] At Fidelity similarly the two operations adjoin each other. Truax were going to put in a big washing plant—well, perhaps they had put it in, but in any case, we were mining up not too far from that washing plant. Perhaps [457] at times we could have used that washing plant instead of hauled coal way down to ours.

Those would be some of the things. Furthermore, in our selling and executive expenses, our sales personnel called on the same people as their sales personnel. There is an obvious economy there.

BY MR. HEDLUND:

Q Was there at that time, if you know, a substantial tonnage of both companies going to the same destinations?

A Yes, there was.

Q If you know, at that time—

A (Continuing) That's why, as a matter of fact, we set up a joint barge company, because we both barged coal to the northern—to Northern States Power Company.

Q Is it a fact, if you know, Mr. Kolbe, that at that time Truax was much more of a competitor of United Electric than Freeman was?

A I would think it was. I would think it was. I might say it definitely was.

• • • •

[474] A The front end of my excavator, I suppose, could be—would do what a German one would, could be developed that way.

The rear end, that is to say, the one part that dumped the material back, would have [475] to be extended. That extension would be—might have to be—would have to be, I would say, a series of separate, independent conveyors; 300 feet, that would be—well, it would be quite a conveyor system back there. It would require modifications. The success of those modifications would, of course, depend on your thickness of coal. If you were uncovering a lot of coal, and if that were cheaper than a deep mine, you might do it. Otherwise, you wouldn't do it. It would require engineering modifications which might be very severe modifications.

BY MR. HEDLUND:

Q It is true, is it not, Mr. Kolbe, that strip mining as it is practiced in Germany is radically different than it is in this country?

A They have to move overburden, they have to move it and then they have to move the coal. And, of course, everything is different. I mean—I don't mean—I mean everything in the world, each mine is different. The fact that there were interchangeable things is shown by the fact that Krupp would come over here and utilize their machines here. Sure, it is [476] different.

• • • •

[516] Q —whether or not it was?

A No.

Q You are familiar, are you not, with the fact that in 1962 Truax merged with Consolidation Coal Company?

A Right.

Q Do you have an opinion as to whether that merger, at the time, awarded Truax stockholders more value or less value than would have occurred had you merged with Truax at the 1.45 to one ratio?

MR. CUSACK: We object, Counsel, as calling for a purely speculative answer by the witness.

BY THE WITNESS:

A Well, I have no idea—

MR. CUSACK: It is very far afield.

BY THE WITNESS:

A I don't know things like that.

BY MR. HEDLUND:

Q You have no opinion?

A No. I have no opinion.

Q Very well.

A The whole thing was useless from then [517] on from my standpoint. Why should I have an opinion?

Q Mr. Kolbe, while you were chief executive officer of United Electric, did you make any attempt to acquire or merge with any other coal company?

A I spoke to Sam Sherwood at one time about acquiring part of his properties.

Q Was he at that time president of Sherwood-Templeton Coal Company?

A Yes.

Q When was this that you spoke with him?

A I don't remember. I never got any place. He said, "I wouldn't have a job if I sold out to you", so that ended it.

Q This was before, was it, Sherwood-Templeton was acquired by Peabody?

A Oh, yes.

MR. CUSACK: Counsel, you are misstating the facts. Sherwood-Templeton Coal Company was not acquired by Peabody Coal Company.

The Stonefort Coal Mining ompany, Inc., the operators of the Will Scarlet and [518] Allendale Mines, were acquired by Peabody Coal Company in 1966. Mr. Sherwood was president of Stonefort.

BY MR. HEDLUND:

Q Is that correct, Mr. Kolbe?
A What? His (indicating Mr. Cusack) statement?
Q Yes.
A I wouldn't know.
Q What position did Mr. Sherwood have at the time you had these discussions with him, if you recall?
A Well, he was the owner—well, he ran them, and—
Q I am sorry, sir. Ran what?
A The coal properties of—he inherited some coal properties and—
Q Could you identify these coal properties in some way, either by the names of the mines or—
A Let's just say extensive coal properties, because I do not know all that he owned, nor do I know that I would have an interest in all that he owned.
[519] I spoke to him about certain properties, but I can't remember what they were, whether—he had a property, for instance, in Fulton County or near Fulton County called Little John, but he wasn't interested in selling to us.
Q Can you recall any other coal company—
A We negotiated with Little Sister. In fact, we negotiated—in fact, we tried to acquire the properties when the original owner died, and Bill Cook acquired them.
Later on—that was in 1944, I think. Later on I discussed with Bill Cook at length acquiring his properties.
Q That is, Little Sister?
A Little Sister, and finally Truax acquired it.
Q Can you think of any other coal company or coal company properties, other than isolated blocks of reserves, that you attempted to acquire?
A Eitelgeorge had a small coal company in Southern Illinois called Unity.
Q Unity?

[520] A I think it was Unity. It might not have been. Peabody later acquired it.

Q Do you recall when this attempt was made?

A I suppose in the 1950's.

Q Are there any other coal companies or coal company properties that you can think of that you made an attempt to acquire?

A Well, I would like to have acquired a property from Ayrshire. I have already talked about the Denmark one. They had a property in Danville, which they called the Harmattan, which means "hot wind" in Arabic.

MR. YOUKER (Official Court Reporter): How do you spell it in English, please?

BY THE WITNESS:

A H-a-r-m-a-t-t-a-n.

MR. CUSACK: Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. HEDLUND: On the record.

BY MR. HEDLUND:

Q You have testified that you tried to [521] get the Denmark acreage?

A Yes.

Q You said, I believe, that you would like to have gotten the Harmattan property.

A Yes.

Q Did you make an attempt to acquire that?

A It never went very far. The reason why I wanted to acquire it was that I thought it an ideal mine for the Wheel. They were working it with two draglines, and I thought a Wheel would be the way to mine it.

Q Do you recall when this attempt was made?

A No.

Q It would have been in the 1950's, would it, Mr. Kolbe?

A It might have been in the late 1940's.

Q The Harmattan mine is near to what used to be the Mary Moore Mine of United Electric, is that not right?

A That is right, but had no real—the two would be entirely separate. There was also a mine next door to the Mary Moore, a deep mine.

They were mining the same seam as we [522] did, but it was a deep mine. I think we had some talks with them, but I don't remember.

Q Was that the V-Day Coal Company?

A Yes.

Q Mr. Zamberletti?

A Yes.

Q Was he president of that company?

A That is right.

Q Did you ever make any attempt to acquire the company or the properties of Midland Electric?

A No.

Q Is it a fact, Mr. Kolbe, that at one time the United Electric Coal Companies owned the Denmark acreage?

A They could have. I am not sure. There was an Electric Shovel Coal Company before my time, which afterwards became the Ayrshire, and Ayrshire-Patoka. Later it took in Patoka, I think, and I can't testify as to what occurred in the period with those promoters, when those promoters, et cetera, were running the company and Electric Shovel.

MR. CUSACK: Off the record, please.

MR. HEDLUND: All right.

[523] (There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. HEDLUND: On the record.

BY MR. HEDLUND:

Q In any event, you do not recall that that was the fact, while you were either on the board or an officer of United Electric?

A No. That was all in the past.

MR. CUSACK: Page 3 of the 1930 annual report.

BY MR. HEDLUND:

Q Mr. Kolbe, you are aware, are you not, that United Electric filed numerous foreign patent applications in connection with devices used on the Wheel Excavator?

A Right.

Q Was that at your direction?

A Yes.

Q Do you know whether anyone has ever been granted a license under any of the foreign patents that issued following those applications?

A No, but the patents are being used.

• • • •

[568] Q You, sir, were also an important member of the Research and Development staff? Is that true, sir?

[569] A Yes. That would be true.

Q Is it true to say that between 1945 and 1949, a considerable portion of your time as chief executive officer was involved with the engineering aspects of the Wheel?

A Yes. I have already said that I didn't busy myself much with sales. We had a good Sales Department.

After I had changed the mine managers, we had a good organization at the mines.

We had a good Purchasing Department. We had a good Accounting Department. While I worked on all of these departments, I did devote a great deal of time to new ways of doing things.

I felt that we had to be able to mine high overburden, we had to get the cost of explosives down, and that we had to have a better drill, and there were probably a lot of other things.

Q Did you also have a good Land Department during that period of time?

A Yes, we had a good Land Department.

Q Was Mr. Latimer a member of that department?

[570] A Yes.

Q Was he, in your opinion, a qualified individual, and competent?

A He was a good man to go out and buy land, because he is a man of high integrity and he conveys that impression to people, and he is persistent and so forth.

I think all of our men were good men.

Q Were there—

A I must say on the Land Department that the Operating Vice President also was vitally interested in land. He would not go out and negotiate land, however.

Q With respect to Mr. Latimer, other than the duties involved in going out and securing land, was his competence in other areas as great as that?

MR. CUSACK: What other areas, Counsel?

THE WITNESS: What other areas?

MR. HEDLUND: In any other areas Mr. Latimer may have been involved in.

MR. CUSACK: He testified he was a land man, a competent land man.

* * * *

[637] Q —with respect to explosives?

A Yes. I might say that other people tried to get—the final break-through was in [638] Indiana, and they could get no patent on it.

My position with the Patent Office often was this: The Patent Office said, "Everybody knows that." I would say to them, "If everybody knows it, why doesn't somebody use it?"

Well, they just had no answer to that one, but that evidently is—just because everybody knows it and everybody is so smart and has a need for it but doesn't use it, doesn't enable you to get a patent, which I think is an unreasonable position on their part, but it is their position.

Q During your direct examination by Mr. Cusack, you referred to a number of experiments that you conducted with nitrogen tetroxide.

A Nitrogen?

Q Tetroxide.

A Nitrogen—was it penta or tetra? Was it pentanitromethane?

MR. STEVENS: Do you have the page reference, Mr. Hedlund?

BY THE WITNESS:

A Not nitrogen tetroxide.

MR. HEDLUND: Nitrogen tetroxide.

* * * *

[654] Q In other words, it is your best recollection that you applied the name "Unimite" to a number of explosives, only one of which was the ammonium nitrate-coal dust-nitromethane composition?

A We might well have used it for the one having fuel oil in it, too. I don't really see why we would change the name.

We weren't advertising it to the general public. We were just using it for our own purposes.

Q It is true, is it not, that the composition ammonium nitrate, coal dust and nitromethane was not of your invention?

A No. That is not true. I am the only person, as I remember it, who ever used ammonium—who ever put in the nitromethane.

MR. CUSACK: Mr. Hedlund, the Government fails to see the relevancy of this line of questioning, which we feel continues to attempt to impeach the witness on irrelevant, and at best remote and collateral matters which are not probative to any of the issues in this lawsuit. We therefore move to strike, and I [655] object to any further examination along these lines.

MR. HEDLUND: I again bring to your attention, Mr. Cusack, that at various places in the record it was you who brought up Unimite, and I am attempting to try to find out what the facts were.

BY MR. HEDLUND:

Q Mr. Kolbe, do you know who Robert W. Lawrence was?

A No.

MR. HEDLUND: Mr. Youker, will you please mark for identification as Kolbe Deposition Exhibit S, a copy of United States Letters Patent No. 2,325,064, under date of July 27, 1943, entitled, "Explosive Composition, Robert W. Lawrence, Wilmington, Delaware, assignor to Hercules Powder Company, Wilmington, Delaware, a corporation of Delaware."

(The document was thereupon marked Kolbe Deposition Exhibit S for identification, 10-28-68.)

MR. HEDLUND: Having done so, would you tender Kolbe Deposition Exhibit S to the [656] witness, please.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY MR. HEDLUND:

Q Mr. Kolbe, I direct your attention to Column A of Table 1 appearing on Page 2 of Kolbe Deposition Exhibit S.

MR. CUSACK: Counsel, are you marking for identification, the covering memorandum on these Letters Patent?

MR. HEDLUND: Not at this time.

MR. STEVENS: You are directing his attention to Column A?

MR. HEDLUND: Column A of Table 1 on Page 2.

THE WITNESS: What page?

MR. HEDLUND: Page 2.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A All right.

BY MR. HEDLUND:

Q Does this refresh your recollection, Mr. [657] Kolbe, that in point of fact the explosive consisting of nitromethane, ammonium nitrate and coal dust was in fact the invention of one Robert W. Lawrence, assigned to Hercules Powder Company?

MR. STEVENS: Mr. Hedlund, first of all, the table to which you have referred does not refer to coal dust. I do not know what it is. It certainly has to be read in context with the entire application.

I suggest that you take the time to read such portion as you need to, Mr. Kolbe, to answer the question.

BY THE WITNESS:

A This has only—this doesn't have kerosene in it or coal dust, as pointed out. It uses nitromethane.

I tried to get a patent on this, did I not? Did you just read where I did?

MR. HEDLUND: No, sir, you did not, not on this composition.

BY MR. HEDLUND:

Q Would it help to refresh your recollection if I informed you of the fact that the company took a license from the Hercules Powder Company with [658] respect to this formula upon which United Electric was required to pay a royalty?

A We took a license from—let's see. Hercules worked with Akre in Indiana, and they used simply ammonium nitrate, as I remember it, and coal dust.

As I remember it, though, they gave us that license in return for my patent on a container.

Q That had nothing to do with Unimite, did it, Mr. Kolbe?

A It was simpler, you see. It left out the nitromethane and just used coal dust, as I remember it. When was this license taken?

MR. HEDLUND: In that connection, I state for the record that the license agreement with Hercules Powder Company was dated May 1st, 1956, and revised under date of June 27, 1956, and I would like to have Mr. Youker mark as Kolbe Deposition Exhibit T, a two-page letter from, I believe, Mr. LeRoy Keane, Assistant General Manager of Hercules Powder Company, to The United Electric Coal Companies, dated June 27, 1956, directed to the attention of Mr. Frank F. Kolbe, and also signed by Mr. Kolbe on the [659] second page thereof, and having done so, Mr. Youker, would you tender it to the witness, please.

(The Document was thereupon marked Kolbe Deposition Exhibit T for identification, 10-28-68.)

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

MR. CUSACK: I note, Counsel, on the second page it states:

"Agreed to this 9th day of July, 1956, The United Electric Coal Companies, by Frank F. Kolbe."

MR. HEDLUND: Fine, sir. Thank you.

MR. CUSACK: Counsel, may I read the second paragraph on the first page of Kolbe Deposition Exhibit T into the record?

MR. HEDLUND: I would be more than happy to have you do so, Mr. Cusack.

MR. CUSACK: The second paragraph states:

"Hercules Powder Company hereby waives the royalty payment of three-quarters of one cent per pound of explosive composition [660] resulting from the practice of the inventions claimed in United States Letters Patent No. 2,325,064, made and used by you, which would become due under the reference license agreement, so long as Mr. Frank F. Kolbe continues the devolpment and experimental work in the practical application and use of explosive compositions covered by United States Letters Patent No. 2,325,064 at the facilities of The United Electric Coal Companies, and so long as you make available to Hercules for its unlimited use written reports of such development and experimental work, and so long as you permit authorized representatives of Hercules Powder Company at Hercules' election, to visit your plants and observe such development and experimental work. You further agree to grant and do hereby grant to Hercules an irrevocable, non-exclusive, royalty-free license, with the right to grant sublicenses without accounting to you, under any invention first conceived or reduced to practice by you [661] in the performance of the development and experimental work contemplated by this agreement, but such license shall be limited to those inventions conceived or reduced to practice while this letter agreement is in effect."

Thank you.

MR. HEDLUND: Will counsel stipulate that the patent referred to in this letter is the patent that we have had marked as Kolbe Deposition Exhibit S?

MR. CUSACK: It certainly is. It has the same number.

BY MR. HEDLUND:

Q Does this refresh your recollection, Mr. Kolbe, that with respect to the explosive that I believe you have testified for at least a while was referred to as Unimite, consisting of nitromethane, coal and ammonium nitrate, was used by you under license from Hercules Powder originally on a royalty basis and subsequently on a royalty-free basis as long as you complied with the conditions set forth in Kolbe Deposition Exhibit T, which Mr. Cusack has just read into the record?

[662] MR. STEVENS: Mr. Hedlund, I have to object to that long question. You have assumed in your question that royalties were paid prior to the receipt of this letter, and there is no such testimony that I am familiar with. Now, you gentlemen—

MR. HEDLUND: I meant to say—

MR. STEVENS: I think you should ask him that before you assume it in your question.

MR. HEDLUND: All right.

BY MR. HEDLUND:

Q I will ask you, then, Mr. Kolbe, if prior to this letter you were paying royalties to Hercules.

A No.

Q Do you recall that prior to this letter you had a license agreement with Hercules?

A No. I do not recall having a license agreement with Hercules.

Q Do you recall, after the date of this letter, whether or not you continued the development and experimental work in the practical application and use of explosive compositions covered by the patent referred to in Kolbe Deposition Exhibit T?

A Yes, we did—wait a minute. We went [663] ahead

with what we were doing on nitromethane and ammonium nitrate and with coal and oil.

Q Do you recall whether or not—

A It is my remembrance that we had gone ahead with this for some time before any of this ever came up and before I knew about their work. Now, do you know when we started using this material?

Q You will recall, Mr. Kolbe, the reference in the 1956 annual report of United Electric, on Page 9, which states as follows, in part:

> "The cost of this operation was substantially reduced when we inaugurated the use of a new explosive a year ago. After years of research"—

A Yes. We were doing work on that probably before we ever inaugurated the use of it.

We hired—as appeared from Huey's letter, we hired Mr. Damon, we made a contract with Glenn Damon in the Bureau of Mines, by which they conducted work on explosives for us, and I don't know when all that would have happened.

Q I will continue on a little bit from Page 9 of the 1956 annual report, which states in part:

> "After years of research we discovered [664] this compound called Unimite, which had the qualities of strength, compactness and safety, so valuable for our needs."

In addition, Mr. Kolbe, I would like to inform you that the records of United Electric indicate that the use of Unimite, including nitromethane, or rather, consisting of nitromethane, coal and ammonium nitrate, was the company's principal explosive beginning on July 14, 1955, and continuing through May of 1958, and on May 16, 1958, the company began using prilled nitrate and fuel oil as an explosive.

A It doesn't say, though, when we originally got the —when I originally got the idea of using this stuff.

Q No, it certainly does not, Mr. Kolbe, and I think what you have just said is consistent with the statement

on Page 9 of the 1956 annual report, starting with, "After years of research . . ."

A At the time we started using this, we certainly had no intention of getting into any dispute with anybody on any patent. If we had known about it, we would have said so.

Q Do you recall why the company stopped [665] using a nitromethane explosive?

A I think there were two reasons. One reason was that it was discovered that in holes of our size, you didn't have to use it, that you could just use prilled ammonium nitrate, and as a matter of fact, I think we always used prilled ammonium nitrate and simply fuel oil, and that was one reason.

Another reason was that in shipping this nitromethane to automobile factories, where it was used as a solvent for pigments, they banged a car of it into another car, and it went bang.

Q That was at Effingham, was it, sir?

A I think so, although I don't know just where it was. But anyway, that was discouraging.

We had previously considered it just not explosive, and so had the automobile plants, and so had Commercial Solvents. The reason for this I don't believe was ever discovered, but there it was.

It might have been due to impurities in it, I don't know. Impurities make a great deal of difference in these substances.

I might say further, showing our care, that in spite of all of the work we did on explosives, [666] we never ourselves had a single accident in all of this work that I did.

* * * *

[672] MR. HEDLUND: And your third answer on Page 189, and continuing over to Page 190.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A Yes.

BY MR. HEDLUND:

Q You state, Mr. Kolbe, on Page 188, in part:

> ". . . so we talked to the Aluminum Corporation of America about establishing a big aluminum smelter either in St. Louis or along the Mississippi there, or in Perry County, right at our mine."

Is it not a fact, Mr. Kolbe, that at the time you originally talked to Aluminum Corporation, they had a smelter in St. Louis, if you recall?

A They had an aluminum oxide plant there. I am not sure whether they had anything more or not.

Q Do you recall whether at that time United Electric was selling coal to the Aluminum Company facility in St. Louis?

A Yes, we were—that is, we did from time [673] to time.

* * * *

[684] MR. STEVENS: —that your objective is [685] best accomplished by saying, looking at the documents you have shown him and the testimony which you just re-read, is there anything else?

MR. HEDLUND: That is what I am trying to do, and I thought I had done that.

MR. STEVENS: All right.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A I don't remember (b), which is given here.

MR. HEDLUND: That is on—

MR. STEVENS: Referring to the letter of December 13, 1962.

MR. HEDLUND: All right.

BY THE WITNESS:

A What I remember is (a), if Alcoa—I would like to go back to the beginning of the deal.

We had large reserves at Fidelity. I was trying to

find a market for them. We wanted to negotiate. We wanted to get Alcoa interested in buying coal from us.

They objected that our reserves would not last the life of what they wanted to do, so we [686] suggested that we would buy additional reserves, deep coal, to the north of us. That was done.

We had no strings whatsoever on that deep coal, but we thought that they would first use our coal because it would be cheaper. It was logical that they would.

MR. HEDLUND: I am sorry.

BY MR. HEDLUND:

Q By "our coal", you mean at Fidelity?

A At Fidelity mine, yes.

Q All right.

A And when that coal was exhausted, if they needed more, they would give us serious consideration for mining the other, and also, that if they ever sold it, as was covered in that agreement, they would give us the first chance of buying it.

Now, that was the whole thing, and we didn't go into that if we came to a specific proposition for leasing part, Alcoa is willing to consider seriously such a lease. We didn't go into that. I didn't go into that.

I wasn't considering that we would—the coal was purchased for possible use for their aluminum plant. If they didn't want it, they would [687] first consider us as a purchaser, and that, I suppose, would cover the matter in (b), but it was not exactly stated the way it is in (b).

* * * *

[734] BY THE WITNESS:

A (Continuing) I don't know whether this is the time to go into the whole coal history or not, but you must remember that the coal industry is a tough industry and that many people have gone broke in it.

MR. HEDLUND: Yes, I understand that.

BY THE WITNESS:

A (Continuing) Therefore, you don't indulge in the expansion. It's quite a venture, this expansion in the coal industry.

BY MR. HEDLUND:

Q Directing your attention to the first full paragraph on Page 3 of Kolbe Deposition Exhibit Y, do you know whether as of 1956 the competitors of United Electric had better organization for prospecting than United Electric did?

MR. STEVENS: Mr. Hedlund, I think it is only fair to ask you to explain to the witness what you mean by "competitors." Do you mean what Mr. Latimer meant, or do you have a different meaning in this lawsuit, or—

[735] MR. HEDLUND: I have no meaning at all. I believe Mr. Kolbe has testified as to who he believes the competitors of United Electric were. He certainly understood what the word "competitors" meant when Mr. Cusack asked him, and I will use it in the same sense that Mr. Cusack asked him, so that he can understand what I mean by my question.

MR. STEVENS: That does not really help me very much.

Could I have the question again, please.

Q (Read by the reporter.)

MR. HEDLUND: If you would prefer, Mr. Stevens, I can ask him with reference to specific companies. I think that might prolong it.

MR. STEVENS: If he can answer—

THE WITNESS: Let's just answer this.

BY THE WITNESS:

A In Fulton County, let's just take that, I have given you the amount of coal, and you can determine the exact, that we acquired after 1939 for the Buckheart Mine. It was twenty, thirty [736] million tons. The Little Sister, our next competitor—or next field to us—acquired relatively very little, I think, in addition to the field that they were right in.

* * * *

[758] Q Following July 31, 1959, there were five new directors appointed, or rather elected, to the Board of United Electric; that is so, is it not?

[759] A Yes.

Q Were you in favor of that or opposed to it?

A I would much rather have kept my former group of directors, of course, because we would then have gone ahead with the Industry Field and done other things.

Q Following July 31, 1959, Mr. John M. Morris was appointed or elected President of the company and its chief executive officer?

A Yes.

Q Was that with your approval?

A I would rather, if a change were made, and I would have been sharply in favor of a change when I got through with the Banner Mine, I would rather have had Arnold Lamm as President—not as President but as chief executive officer. I told Arnold that, but in the first place, Arnold would not have accepted it because Arnold is a very, very independent person, and he would not have accepted the dictation from Material Service.

I would have been in favor of having Johnny Morris —I would have made Lamm Chairman and * * * chief executive officer. I would have [760] been in favor of making John Morris President because he has been an excellent sales executive, he is perhaps more than a sales executive, and he is perhaps more than a sales executive, but I didn't think he had the mining experience and the drive to establish new mines and that is what Arnold would have brought to the picture.

Q I may have asked you this before, sir, but if not, following Mr. Morris' appointment as President, did you nevertheless continue active in the management of the company?

A I did some things. There's always a question whether you should get out or whether you should stay. If you get out, like the refugee in Germany or whatnot during the Nazis, if you get out you are powerless to influence events. You get out, you save your reputation, you do a lot of things, but you are out and you cannot influence events. My friends still had and I still had a big investment in the corporation. I stayed.

It turned out to be a very good thing that I did, because Tom Tarzy got a contract with Commonwealth Edi-

son. Before that time we [761] had a contract with Commonwealth Edison which called for from 750,000 to a million and a quarter tons. Tom worked out a contract with them for 1,750,000, to two and a quarter million tons.

* * * *

[816] Q Do you have an opinion, Mr. Kolbe, given existing prices for labor, machinery and equipment, and the present condition as it is known in the Industry Field of United Electric, what it would cost to mine that coal per ton?

A Not under today's condition; I don't know what costs are today.

I pointed out the other day, however, that its competitive conditions have been improved by the recent wage agreement.

Q There might be a question, might there not, however, whether its competitive position had been sufficiently improved?

A We thought it a good field in 1959, all of us did, and I think I have seen nothing to make me think it isn't a good field today.

I might say that at some time in the past I told Mr. Nugent that if he didn't like the field and wanted to get out of it, that I would try to find him a purchaser for it. He did not care to sell it.

Q Does that offer still stand, sir?

A I would try to find him a purchaser for it. Yes, it does.

* * * *

[908] A I would like to call your attention that the retail deliveries of coal to other consumers, which would cover those for household use—well, it would cover the customers of Buffalo Creek Coal, [909] that in 1944 it hit a top of 122,112,000 tons, that every year after that, right down to 1965, is less until in 1965 it was 19,048,000.

BY MR. CUSACK:

Q Would that, Mr. Kolbe, account for the discontinuance of the Buffalo Creek operations?

MR. HEDLUND: I object to that as being suggestive and leading.

BY THE WITNESS:

A (Continuing) It was one of the reasons for the market was disappearing. Another reason for our closing the mine was it was not worth while to bring in bigger equipment that could have handled higher overburden.

MR. CUSACK: Thank you, Mr. Kolbe.

• • • •

EXCERPTS FROM DEPOSITION OF ROBERT H. INMAN, TAKEN NOVEMBER 4, 1968

* * * *

[5] I did have a stint in the service. I was a navigator with the 8th Air Force in England.

Q By whom were you employed prior to your employment by Material Service Corporation?

A The United Electric Coal Companies.

Q For how long were you employed with The United Electric Coal Companies?

A Except for three months in 1955, I was there for twenty years, from March 1st, 1948, until April 1st, 1968.

Q Did you work for any other coal companies prior to your association with United Electric?

A No.

Q Did you have any other mining experience before your employment with United Electric?

A No.

Q Mr. Inman, have you had any conversations with Mr. Hedlund or any of the other attorneys for any of the defendants during the past few days or past few months?

A Yes, I have.

Q Did you talk about this case?

A Yes.

* * * *

[7] Q Did you talk about the feasibility of United Electric becoming an underground miner?

[8] A No, we did not.

Q Have you had any conversations with Mr. Morris in regard to this case?

A No, I have not.

Q Have you had any conversations with Mr. Camicia in regard to this case?

A Not in the last year.

Q Did you discuss with Mr. Nugent the testimony he gave during his deposition?

A No, I did not.

Q When you first were employed by United Electric, what was your position?

A Field Engineer.

Q What responsibilities did that entail?

A Particularly surveying and keeping the inventories of the various mines in the Fulton County area.

Q What position did you hold after you were a field engineer?

A Chief Mining Engineer.

Q When did you assume that position?

A Approximately in 1957.

* * * *

[11] MR. CUSACK: Off the record, please.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. FUTTERMAN: Back on the record.

BY MR. FUTTERMAN:

Q Who is Pona Eaton?

A I know him. He was a drill foreman prior to my taking the position.

Q When did you cease to be Chief Mining Engineer of United Electric?

A December, 1964.

Q Did you hold any other position with United Electric after that date?

A I was General Superintendent for a year and then Vice-President of Operations.

Q During your tenure as General Superintendent, to whom did you report?

A John Morris.

Q Was he President at that time?

A Yes, he was.

Q Who reported to you in that position?

A The mine superintendents and various staff people.

[12] Q When did you assume the position of Vice-President?

A I think it was in December, 1965, the following year.

Q Did you have a more specific title than Vice-President?

A Vice-President of Operations.

Q How long did you hold that position?

A Until April of this year.

Q To whom did you report when you were Vice-President of Operations?

A The first year I reported to Mr. Morris, until he retired. Then I reported to Mr. Nugent.

Q Whom did you supervise in your position as Vice-President in charge of Operations? In other words, who reported to you?

A The mine superintendents and my staff.

Q Who succeeded you as General Superintendent?

A The man who succeeded my position, but not with the same title, was R. F. Donaldson.

Q What title does he have?

A General Manager, Strip Mining.

* * * *

[14] BY MR. FUTTERMAN:

Q Is he still employed by United Electric?

A He passed away. He was killed.

Q When you were General Superintendent, who did Mr. Latimer and Mr. Jensen report to?

A To me.

Q When you were Vice-President in charge of Operations, who did Mr. Latimer and Mr. Jensen report to?

A To me.

Q When you assumed the position of Vice-President in charge of Operations, were the duties of the General Superintendent combined with the duties of the Vice-President in charge of Operations?

A Yes, they were.

Q Do you know whether or not Mr. Hepburn had any deep coal experience?

A Not to my knowledge.

Q Would you say from your experience that it would be possible for a strip man to make an evaluation of underground mining equipment in a particular mine?

MR. KEMPF: May I have that question [15] read back, please, Mr. Youker.

Q (Read by the Reporter.)

MR. KEMPF: I am going to ask you to define what you mean by "strip man."

MR. FUTTERMAN: A man who has had essentially all of his mining experience in strip coal mining.

THE WITNESS: Could I have that question back again, please?

MR. FUTTERMAN: Would you read the question again, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A I would not rely on his evaluation. I would say it would be possible but not probable.

BY MR. FUTTERMAN:

Q Did you ever have any deep coal experience?

A No, I did not.

Q Did United Electric Coal Companies at one time consider purchasing the Kerr Coal Company in Colorado?

A Could I have that question again, please?

MR. FUTTERMAN: Will you read the question, please, Mr. Youker.

• • • •

[29] MR. FUTTERMAN: Will you read the question to the witness, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A My testimony is that I am a strip miner and I took the advice of so-called deep mine experts for this answer, and they advised me that it was unprofitable under the conditions that prevailed.

BY MR. FUTTERMAN:

Q Were there any other reasons, other than the unprofitability of the underground mine, that prompted United Electric to reject the purchase of the Kerr Coal Company?

MR. KEMPF: I think the witness has already answered that. He pointed out, for instance, the lack of reserves that you asked him about, any additional reserves.

BY THE WITNESS:

A This was not a normal deep mine operation. Where they were mining at the time, I think there was about 5,000 foot of cover, and it was having roof falls. With these kind of operating obstacles, we did not want to take a chance.

* * * *

[32] Q Do you know if they own sufficient acre-[33] age so that they could justify opening a mine in that area?

A Could I have that question back, please?

MR. FUTTERMAN: Will you read the question to the witness, please, Mr. Reporter.

Q (Read by the Reporter.)

BY THE WITNESS:

A No. I do not know.

BY MR. FUTTERMAN:

Q Did United Electric believe that it would have difficulty in economically producing coal in any No. 2 coal field?

A Could I have that question again, please?

MR. FUTTERMAN: Will you read the question to the witness, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A There are some that we would feel that way about, yes.

BY MR. FUTTERMAN:

Q Where would they be located?

A The Sepo Field, which is near Lewistown, Illinois. The Roodhouse Field we investigated. There is an area at Mount Sterling that we have [34] dropped.

There is an area at Jacksonville, surrounding the bluff, that we thoroughly investigated and dropped. We dropped the Ottawa area and the Augusta area. That is all I can recall at this time.

Q In what county is the Augusta area?

A I do not remember. It is west of McDonough County.

Q Why was United Electric unable to put together a coal field at Roodhouse?

A The No. 2 coal is an erratic coal that cuts in and cuts out, goes up and down. We are leery of mining any coal, any No. 2 coal, after you get over 65 feet of overburden, because of the thinness of the coal. We could not acquire enough tonnage to justify the field.

Q Do you mean that you could not acquire sufficient tonnage at the Roodhouse Field to open a field?

A Commercially strippable.

* * * *

[54] Q Would it be possible to tie up coal in the Augusta area with the Industry Field?

A This was our first effort. I do not think it worked out.

Q Why was that?

A The coal did not go through.

Q Do you recall the tonnage figure for the Augusta area?

A No, I do not.

Q Could you give us any kind of an approximation?

A We were hoping for twenty million. I think it is less than ten.

Q Would that be the total field, or would that only cover those properties which United Electric leased or took options on?

A This would be the figure we would desire to own or control.

Q Who is Dale Emling?

A Chief Mining Engineer, United Electric.

Q Did you order Mr. Emling to make a thorough study of the actual strippable reserves in the Augusta area?

A I think I did. I cannot remember exactly. [55] I am sure I did.

Q Did he make such a study?

A I assume he did, yes.

Q Do you recall whether or not he was able to arrive at a tonnage figure for the Augusta area in this study?

A I think he arrived at a tonnage figure, yes.

Q What was that?

A I think approximately ten million tons. I do not recall exactly.

Q Excuse me?

A I think it was ten million.

Q I see.

A I do not recall.

Q You also mentioned that United Electric had done some prospecting in Jackson County.

A I said near Jacksonville, Illinois.

Q Well, did United Electric at one time investigate strip coal in an area near Murphysboro, Illinois?

A Yes.

Q In Jackson County?

A Yes.

• • • •

[60] Q Is that in Brown County?

A I am not up on my counties. I am sorry.

Q Do you recall how many tons were beneath an overburden of less than 100 feet?

A My memory is not the best on this, but I would say approximately five million tons.

Q Did United Electric explore an area south of the Illinois River as a potential addition to the Banner mine?

A Unofficially, yes.

Q What do you mean by "unofficially"?

A We did not do it in United Electric's name.

Q In whose name did you do it?

A We drilled on someone else's options.

Q Whose options were they?

A I think they were CILCO's options. They were looking for a gas dome and they wanted to drill on our property, so we asked them if we could drill on their property in exchange.

Q "CILCO" is Central Illinois Light Company?
A Yes.
Q Did you find any coal under their options?
[61] A Not too large of a tonnage. We are still interested in the area. We do not want everyone else to know about it.
Q Do you recall approximately how many tons were found there?
A On their properties, approximately five million tons. We are in hopes of obtaining another five million tons.
Q Are these contemplated as future additions to the Banner Mine properties?
A They have not been properly explored, as we only drilled on options that CILCO had. It appeared that if there was coal there, it would be toward the town of Havana, and I think there is a duck hunting preserve down there.
Q Is this a public or private duck hunting preserve?
A I think there are both there.
Q Excuse me? I did not hear you.
A I think there are both in the area.
Q Do you know whether or not United Electric intends to further explore this area?
A I would say they should.
MR. FUTTERMAN: I suggest we take a few [62] minutes' recess.
MR. KEMPF: All right.

(Whereupon a short recess was taken after which the taking of the deposition was resumed as follows:)

MR. FUTTERMAN: On the record.

BY MR. FUTTERMAN:

Q Mr. Inman, I now hand you what has previously been marked for identification as Nugent Deposition Exhibit 38, which is part of a map entitled, "Shipping Coal Mines in Illinois", and ask you if you can identify the county in which the Central Illinois Light Company leases are located.
A I do not know whether they still have the leases or not.

Q The county where they were located when United Electric did the drilling.

A The leases that we drilled on were mainly in Tazewell County. They may have one or two in Mason County.

Q Is that right across the river from the Banner mine?

A Near enough that we would like to process [63] the coal in the Banner mine.

Q Could the coal be transported across the Illinois River by conveyor belt, from Tazewell County to the Banner plant?

A We would have to get the Corps of Engineers' approval.

Q If you could not get that approval, would there be another way of getting that coal across the river?

A There may be other ways, but not as economical.

Q Would you, then, ask the Corps of Engineers for permission to construct this conveyor across the river?

A That would be our first step, yes.

Q Then the conveyor would be the preferred method of getting the coal across from Tazewell County?

A Yes, it would, in my estimation. I am not with the coal company any longer.

Q Mr. Inman, do you recall whether or not United Electric investigated an area entitled the Salt Fork Field?

A Is this the field that could be close to [64] Catlin, Illinois?

Q Yes.

A Yes, we did.

Q Do you recall when the investigation was made?

A In my estimation, it would be 1956.

Q Do you recall the tonnage that was estimated to be in this field?

A It was several years ago, and I could not give you an exact figure, but it was an appreciable tonnage.

Q Would 35,000,000 tons refresh your recollection?

A It sounds reasonable, yes.

Q Did United Electric take any options in this area, or any leases?

A Yes, it did.

Q What happened to those leases and options?

A Could I have that question read again?

MR. FUTTERMAN: Would you read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A To my knowledge they were dropped when [65] the date was up.

BY MR. FUTTERMAN:

Q What was the reason or what were the reasons for terminating these leases and options?

A As you know from the date, this was before my being involved in the overall planning. I could not give you a definite reason.

Q Do you recall the date when these leases and options were dropped?

A We usually obtained options for approximately one year. I do not recall the exact dates.

Q But it is your recollection that the area was investigated around 1956?

A Yes, sir.

Q So would it be fair to state that the options and leases would have been terminated somewhere around 1957?

A Yes, sir.

Q Do you recall why United Electric decided to drop the leases and options in this area?

MR. KEMPF: I object. I think you have asked him and he has answered that question already.

MR. FUTTERMAN: Would you answer the [66] question, please.

THE WITNESS: Could I have the question again?

MR. FUTTERMAN: Read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A Only by hearsay.

BY MR. FUTTERMAN:

Q What did you hear?

A That we did not have any machinery that would handle this material.

Q When you speak about "material", are you referring to the overburden?

A Yes, sir.

Q What do you mean by "handling" it?

A That the depth of the overburden was too high for the machinery that we had available at that time.

Q What was the depth of the overburden?

A Well, you are taking me back quite a few years, but I assume that it started about 60 feet, and as you progress westerly, it goes up to 150 to 200 feet.

[67] Q Would present stripping machinery be capable of mining some or all of the coal in the Salt Fork Field?

A I would have to review the drilling, but I would say yes.

Q Can you recall whether or not there would be sufficient tonnage in the Salt Fork Field which could be mined by present available stripping machinery?

A I would like to review the maps before I would answer that.

Q Mr. Inman, are you certain that United Electric dropped all of the options and leases it had in the Salt Fork Field after one year, after holding them for one year?

A I could not swear to that.

Q So that it is possible that some of these options and leases may have been continued beyond the one-year period that you referred to?

A It is possible, yes.

Q Do you recall approximately how far the Salt Fork Field was from the Mary Moore mine?

A Approximately four miles.

Q If sufficient tonnage had been available [68] in the Salt Fork Field to justify a mining operation, could the coal have been processed through the Mary Moore facilities?

A On a small scale. This was a very small plant.

Q Well, if sufficient coal were found in the Salt Fork Field to justify mining, would it have been feasible to expand the facilities at the Mary Moore mine?

A I would say yes.

Q In your opinion, and in the light of the technological advances that have been made during the past ten years in stripping equipment, would it be reasonable to go back to the Salt Fork Field and take another look as to whether or not it could possibly be mined?

MR. KEMPF: If that field was available?

BY THE WITNESS:

A If the field is available, yes.

BY MR. FUTTERMAN:

Q Do you know if the field is available?

A Only by hearsay, I hear that it is not. I do not know for a fact.

Q Do you know or have you heard who owns [69] the field now?

A I understand, and I only heard this, that Ayrshire picked it up.

Q Do you know approximately when they picked up the Salt Fork Field?

A Just as an estimate, in 1960 or 1961, and this is only an estimate.

MR. FUTTERMAN: Just one moment, please.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY MR. FUTTERMAN:

Q Mr. Inman, did United Electric ever make an offer to Illinois Power Company to mine coal that was owned by Illinois Power Company adjacent to their Vermilion plant?

A I do not know whether we made an offer or not.

Q Did you investigate this possibility?

A We drilled their property.

Q What were the results of that drilling?

A High overburden and a poor type of overburden, to my recollection, of high sand content.

* * * *

[84] Q When the ratio for strip coal is so high that the feasibility of economically mining [85] the coal—withdraw that.

Do you recall how many tons were involved at the Petersburg, Indiana, property?

A No, I do not.

Q Was any utility planning to build a new power plant near the Petersburg, Indiana, Field?

A This was my understanding.

Q Do you know which utility that was?

A Some utility in Indiana. I do not recall the exact name.

Q Do you recall whether or not the utility eventually built a plant near the Petersburg Field?

A Not to my knowledge.

Q Where is the Belle Rive Field located?

A I think it is approximately 20 miles southeast of Mount Vernon, Illinois.

Q What kind of coal was present at Belle Rive?

A Coal miners have a certain name for it that I do not want to use right now, but I do not think it has a designation.

Q Was it strip coal?

A Partially.

[86] Q Part of it was underground?

A Part of it had a very high ratio.

Q Do you recall the tonnage figure for that field?

A No, I do not.

Q Do you recall the coal thickness?

A Not exactly.

Q Could you give us your best recollection of that figure?

A Under 30 inches.

Q Do you recall the average overburden depth?

A No, I do not.

Q In regard to the thickness, do you mean that the coal was 30 inches thick, more or less?

A Less than 30.

Q How much less?

A I do not recall how much less.

Q Was it more than two feet?

A No, it was not.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

[87] BY THE WITNESS:

A I want to ask a question. When you say "Was it more than two feet", you asked me if it was less, was it more than two feet, it is confusing to me.

MR. KEMPF: I suggest that the Reporter read back the question.

Q (Read by the Reporter.)

MR. KEMPF: Mr. Reporter, will you read the prior questions and answers concerning the 30 inches thick.

(The record was thereupon read by the Reporter as above recorded.)

MR. KEMPF: Does that clear it up in the witness' mind?

MR. FUTTERMAN: I will ask the question again.

BY MR. FUTTERMAN:

Q How much less than 30 inches is the thickness of the coal at Belle Rive?

A I do not recall.

Q Is the thickness greater than two feet?

A I do not recall exactly. I think it was.

Q Do you recall whether or not United [88] Electric, in its analysis of the Belle Rive Field, segregated the coal deposits into those deposits beneath 40 feet of overburden and those deposits beneath greater than 40 feet of overburden?

A I do not recall that we did do that.

Q Does that distinction have any meaning to you?

A Not those particular figures, no.

Q Why was the Belle Rive area ultimately rejected?

A Our feeling was that there was not enough strippable coal there to open an operation.

Q When did this investigation take place?

A In 1963 or 1964.

Q Was the Belle Rive Field investigated at the same time that the Petersburg, Indiana, properties were evaluated?

A No, it was not.

Q When were the Petersburg properties evaluated?

A One or two years prior.

Q Is it not a fact that another coal producer picked up the Belle Rive Field?

[89] A Not to my knowledge.

Q Have you heard about any coal producers drilling in the Belle Rive area subsequent to United Electric's evaluation of the area?

A No, I have not.

Q Did United Electric explore any coal fields in Sebastian County, Arkansas?

A Not to my recollection.

Q Have you ever heard of W. B. Hillery?

A Yes, I did.

Q Do you know with what company he is associated?

A I think he is dead.

Q Excuse me?

A I think he is dead.

Q Do you know with what company he was associated?

A I think we had him on a retainer to watch some of our properties.

Q Have you ever heard of the Greenwood Cut Stone Company?

A No, I have not.

* * * *

[105] Q Who was on the board of directors at that time?

A I think they lacked aggressiveness since 1940. I could not tell you who it was.

Q Was Mr. Hepburn the Operating Vice-President during all of that period?

A No, he was not.

Q When did he become Operating Vice-President?

A 1955.

Q Who preceded him as Operating Vice-President?

A Mr. Pinckney.

Q Is he still alive?

A No, he is not.

Q Who was the President of United Electric during this period?

A For the first part of the period it was Mr. Kolbe. During the latter part it was Mr. Morris, until last year.

Q When did Mr. Morris become President?
A I do not remember the exact date.

• • • •

[112] Q Is it not a fact that he prepared a [113] report on a proposed high wall operation at the United Electric Fidelity mine in DuQuoin, Illinois?

A He may have referred to one operation in that manner and made a survey.

I was with him when he visited our mine for that purpose, but I still do not understand this terminology.

Q How many tons did he estimate to be available for mining purposes by this high wall method

A I do not remember the tons he would estimate.

Q Does United Electric currently plan to mine this coal?

A Where Mr. Matheson made his survey?

Q Yes.

A No.

Q Why not?

A Well, I think it is covered with water now. It was too small a tonnage to purchase equipment and start an underground operation.

• • • •

[134] BY MR. FUTTERMAN:

Q Would it be more desirable for United Electric to plan future mining operations in central and southern Illinois as opposed to Fulton County?

MR. KEMPF: I would like that question read back, if I may, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A I still do not understand the question. When you say "plan", what has that got to do with the mining? I do not think I can answer that question.

BY MR. FUTTERMAN:

Q Would United Electric realize greater profits by developing mining fields or mines in central and southern Illinois as opposed to Fulton County?

A Not in my opinion.

Q Why not?

A It is difficult to plan mining anywhere, where there are no reserves. I do not know of any reserves in central or southern Illinois available to plan to mine. Therefore, I feel that we should [135] continue mining central Illinois, or Fulton County, Illinois.

* * * *

[139] ROBERT H. INMAN,

called as a witness by the plaintiff herein, having been previously duly sworn, was further examined upon oral interrogatories and he did thereupon depose and testify further as follows:

DIRECT EXAMINATION

(Continued:)

BY MR. FUTTERMAN:

Q Mr. Inman, how many tons of coal are there in the Beaucoup Field?

A I do not remember.

Q Do you know if there is any strip coal in the Beaucoup Field?

A Not in what I know as the Beaucoup Field, no.

Q What do you conceive the Beaucoup Field to be?

A This was an area that United Electric was acquiring property for The Aluminum Company, and they outlined the area they wanted reserves acquired in.

Q Was this Alcoa?

A Yes. I think it was.

* * * *

[155] Q Would United Electric control both the [156] Round Prairie and the Beaucoup Field but for the arrangement with Alcoa?

A Not in my opinion.

Q Why not?

A I have been advised that we have no rights to it.

Q What?

A We have no rights to it.

Q Who advised you that you had no rights to it?

A Our law firm.

Q You mean you have no rights to the coal?

A That is correct.

Q I am asking you to make an assumption that had United Electric not had any kind of an arrangement with Alcoa, would United Electric have taken the leases and options in the Beaucoup Field for United Electric?

MR. KEMPF: Let me have that question again, please, Mr. Reporter.

Q (Read by the Reporter.)

MR. KEMPF: Or anyone else, as far as that is concerned. Also, I think the question is objectionable on the basis that it [157] contains an assumption which is contrary to the fact, but if you want to ask him that question, although it is highly hypothetical in nature, we will not object to his answering it, if he understands it.

BY THE WITNESS:

A Not in my opinion.

BY MR. FUTTERMAN:

Q Is it your testimony that instead of United Electric obtaining leases for Alcoa, United Electric should be taking leases in the Round Prairie Field?

MR. KEMPF: I do not recall his testifying to that. If you want to ask him a question about it, you certainly may. Is that a question you are asking?

MR. FUTTERMAN: Yes.

MR. KEMPF: Oh. I would like to have the question read. I am sorry.

Q (Read by the Reporter.)

BY THE WITNESS:

A United Electric is taking leases in the Round Prairie Field.

[158] BY MR. FUTTERMAN:

Q Should they be taking more leases in that field, in your opinion?

A I am not qualified to answer that question.

Q Why not.

A I am not a deep miner and this is a deep coal location.

Q How long has United Electric been taking leases in the Round Prairie Field?

A I do not know the exact time.

Q Would it be before 1958?

A I think it was.

Q Is there a difference in the quality or depth of the coal at Round Prairie as against the coal in the Beaucoup Field?

A I do not know, without referring to records.

Q Do you know approximately the depth of the coal in the Round Prairie Field?

A Plus 200.

* * * *

[159] MR. FUTTERMAN: If the witness understands the question, I would ask that he [160] answer it.

MR. KEMPF: I would ask the witness to explain the basis on which he is answering the question, then. In other words, I have no objection to the witness answering the question, as long as he—

BY THE WITNESS:

A I would recommend that United Electric continue to take leases mainly west of the Mississippi River.

BY MR. FUTTERMAN:

Q In what areas west of the Mississippi River?

A New Mexico, Arizona, Colorado, Wyoming and North Dakota, if there are any areas available.

Q What about in the state of Illinois? Are there areas where you think United Electric should be taking leases?

A I do not know of any area which would be available in the state of Illinois.

Q What about Schuyler—

A If there is, I would recommend their taking them.

[161] Q What about Schuyler and McDonough Counties?

A I think that we covered those counties fairly well in our previous options and drilling.

Q What about in Tazewell County?

A Possibly in Tazewell County.

MR. KEMPF: I would ask the witness, possibly what? What is your answer?

BY THE WITNESS:

A There is a small coal area in Tazewell County near the Banner mine.

BY MR. FUTTERMAN:

Q Do you believe that United Electric should be taking leases or options in that coal area?

A They should make an effort to, yes.

Q Do you know if they have done so?

A I do not know.

Q What about in the Augusta Field? Should United Electric take some options or leases in that area?

A I think I mentioned yesterday that I thought that we should investigate it, yes.

Q Should United Electric be optioning or leasing more land at Industry?

[162] A To fill in the field, possibly.

Q Do you have any idea how many tons they could pick up in addition to what they already own?

A One or two million tons.

Q Do you feel that the Industry Field may ever be mined?

A Some do, yes, sir.

Q Do you have any idea when?
A No, sir.
Q Would it be in ten years?
A I do not know.
Q Would it be more than twenty years?
A I do not think so.
Q Would it be after United Electric's Fulton County coal reserves run out?
A Possibly, yes, sir.
Q Would it be between ten and fifteen years from the present?
A I could not pin it down that close.
Q Would it be less than twenty, though?
A I think it would, yes.
MR. FUTTERMAN: Counsel, will you stipulate that the Industry Field will be mined [163] within fifteen to twenty years?
MR. KEMPF: No, we will not.
MR. FUTTERMAN: Counsel, will you stipulate that it may be mined within fifteen to twenty years?
MR. KEMPF: No, I will not.

BY MR. FUTTERMAN:

Q Mr. Inman, is the coal seam at Round Prairie the seam currently being mined at Fidelity, as part of the same seam?
A It has the same numeration. I guess it would be—in my opinion it would be called the same seam, yes.
Q Why did UEC take leases and options in the Round Prairie Field?
MR. KEMPF: If he knows.
MR. FUTTERMAN: We do not want you—
MR. CUSACK: Obviously.
MR. FUTTERMAN: We do not want you to answer if you do not know, Mr. Inman.
THE WITNESS: What was the question, please?
MR. FUTTERMAN: Mr. Youker, will you please read the question.
[164] Q (Read by the Reporter.)

BY THE WITNESS:

A I think someone recommended it to our officials, that as long as the Beaucoup Field looked good to Alcoa, "Why not join the group?"

BY MR. FUTTERMAN:

Q Who was this? Who made this recommendation to your officials?

A Either Mr. Hepburn—I believe it was Mr. Hepburn.

Q Did United Electric consult with any other coal producers in regard to the options and leases it took in the Round Prairie Field?

A We sent our drill logs and maps to Freeman Coal Company, to get their opinion of the possible mining technique in this field.

Q When did you do this?

A I don't remember the exact date, but I will say in the early 1960's.

Q Did Freeman suggest any mining techniques that could be used in the Round Prairie Field?

A It was their opinion that the long wall method would not work in this field.

[165] Q Did they have any opinion that they suggested as to what technique would work?

A I do not remember.

Q Is your testimony that you do not remember whether or not they gave an opinion, or you do not remember, if they gave an opinion, what that opinion was?

A I think I stated that their opinion was that the long wall method would not work. They did not advise us what method would work.

Q Did United Electric consult with any other coal producers in connection with the Round Prairie Field?

A I do not know.

Q Mr. Inman, what is a checkerboard acquisition pattern?

A Well, this is in the area of the sectionalized system of land. If you have certain areas, not all of the areas, it appears to be a checkerboard, such as every other section or every third section.

Q Is this a procedure designed to exclude another producer from coming in and acquiring acreages within the field that you are working?

A Could I have that question back, please?

* * * *

[171] Mr. Kempf handed the witness Inman Deposition Exhibit No. 2.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

THE WITNESS: Do you have a question pending?

BY MR. FUTTERMAN:

Q My question is, who did you have in mind as the coal producer which would mine the Round Prairie Field, when you made that statement?

A I did not have anyone in mind.

Q When you wrote that statement did you believe that United Electric would not be able to mine that coal?

A I believe the present and that organization at that time would not have been able to.

MR. FUTTERMAN: Excuse me. Would you read that answer back again, please, Mr. Youker.

A (Read by the Reporter.)

BY MR. FUTTERMAN:

Q What do you mean, when you say "present"?

A Now or then.

[172] Q Oh.

A United Electric.

Q Why?

A There was no one experienced in deep mining.

Q Is it not possible to acquire personnel competent and experienced in deep mining?

MR. KEMPF: May I have the question read, please, Mr. Youker.

Q (Read by the Reporter.)

MR. KEMPF: I object to that question as having been asked this morning and answered by the witness, and on that basis I instruct him not to answer.

MR. FUTTERMAN: Would you answer the question, please.

MR. KEMPF: Let's have the question reread, please, Mr. Youker.

Q (Re-read by the Reporter.)

MR. FUTTERMAN: I am asking this question in regard to the Round Prairie Field.

MR. KEMPF: Well, I think—

MR. FUTTERMAN: The question this morning was not asked in regard to the Round Prairie [173] Field. I believe it is a different question, and I would ask that the witness answer the question.

MR. KEMPF: I am not sure I see any difference, but the witness may answer the question. I want the record to show that I preserve my objection and feel that the question is certainly encompassed by the question you asked this morning.

BY THE WITNESS:

A I am sorry, but I will have to have it back.

MR. FUTTERMAN: Will you read the question please, Mr. Youker.

Q (Re-read by the Reporter.)

BY THE WITNESS:

A I consider "possible" a big word. I am not knowledgeable whether it is possible or not, because we have never tried it.

BY MR. FUTTERMAN:

Q Mr. Inman, if United Electric did hire competent deep coal engineers, supervisors and other personnel that would be necessary for deep mining, in your opinion could United Electric mine [[174] the Round Prairie Field?

MR. KEMPF: May I have that question re-read, please, Mr. Youker.

Q (Read by the Reporter.)

MR. KEMPF: You are limiting this to personnel, I gather.

MR. FUTTERMAN: That is right.

BY THE WITNESS:

A I do not know.

BY MR. FUTTERMAN:

Q Do you think it could not mine the Round Prairie Field if it was able to employ all the necessary personnel for deep mining?

A I do not know.

Q Mr. Inman, in 1963 was there some question in regard to pursuing the Round Prairie Field further, which question was raised by a possible deal with Alcoa?

A I do not know.

Q Was there a proposal or a deal offered by or to Alcoa in 1963, other than the arrangement relating to the Beaucoup Field?

* * * *

[179] BY MR. FUTTERMAN:

Q When did you first learn that United [180] Electric was taking leases and options in the Round Prairie Field?

A I do not remember the exact date. It could have been 1958 or 1957, some place in there. My answer was as of today.

Q I am talking about as of 1957 or 1958.

A Well, the board of directors directed that we take the options. I was not in full authority at United Electric.

Q Did you object to taking options in the Round Prairie Field in 1957 or 1958?

A I do not think I was in a position to object.

Q Did you express any opinions to any United Electric officials?

A I am sure I did.

Q Do you recall what those opinions were?

A No, I do not recall what those opinions were.

Q Were you against taking options in the Round Prairie Field?

A Personally?
Q Yes.
A Yes.
[181] Q Why?
A It was deep coal, and I would rather be spending our money on strip coal.
Q Did Mr. Hepburn think that United Electric could mine the Round Prairie Field?
A I do not know what Mr. Hepburn thought.
Q Did you ever have any discussions with him as to whether or not United Electric could mine the Round Prairie Field?
A I do not remember those discussions, if there were any.
Q Did Mr. Utterback think that United Electric could mine the Round Prairie Field?
A I do not know what Mr. Utterback thought.
Q Did you ever have any discussions with Mr. Utterback in regard to whether or not United Electric could mine the Round Prairie Field?
A No, sir.
Q Did Mr. Kolbe think that United Electric could mine the Round Prairie Field?
A I do not know what Mr. Kolbe thought.

* * * *

[188] MR. KEMPF: I think that was asked and answered this morning.
MR. HEDLUND: No, it was not.
MR. KEMPF: All right. I will withdraw my objection.

BY THE WITNESS:

A Prior to my association with United Electric, which was in 1948.

BY MR. FUTTERMAN:

Q Was Ayrshire taking options and leases where they now have the Sun Spot mine at the time you came with United Electric?

A I do not know.

Q Do you know when Ayrshire bega to take options and leases in the area where they now have developed their Sun Spot mine?

A No, I do not.

Q Is there any competition between United Electric and Ayrshire for the land in and aro nd the Industry Field?

A In the Industry Field?

Q Yes.

A No.

* * * *

[198] (The prior question was thereu on read by the Reporter.)

MR. FUTTERMAN: He answered that question.

BY THE WITNESS:

A Yes. Then my answer to the se cond question is the same.

MR. FUTTERMAN: Thank you.

BY MR. FUTTERMAN:

Q Are you familiar with the Kai arowits Plateau coal deposits?

A I have been there. I have look d at their drill logs.

Q Is that strip or underground coa ?

A In my opinion, it is underground coal.

Q Where is that located?

A It is just on the southern Utah b rder near Page, Colorado—Page, Arizona.

Q Did United Electric investigate hese deposits?

A In conjunction with Freeman Co l Company.

Q Did you suggest to Mr. Morris tha the Kaiparowits Plateau properties be brought to the a tention of Freeman Coal Mining Corporation?

[199] A I do not know that I sugge sted that to Mr. Morris. I think he was already aware of it, and Freeman Coal Company was aware of it.

Q Did United Electric turn over o Freeman any underground coal possibilities or proper ties that it came across?

MR. KEMPF: What do you mean by "turn over", counsel?

MR. FUTTERMAN: I mean, bring them to the attention of Freeman rather than pursue them for their own benefit.

BY THE WITNESS:

A No, not to my knowledge.

BY MR. FUTTERMAN:

Q Mr. Inman, during your tenure with United Electric, was there a figure in the annual budget for the acquistion of coal reserves?

A In the past few years, yes, sir.

Q What do you mean by "the past few years"?

A Prior to the past few years we did not operate on a strict budget.

Q In other words, are you saying that there was no limit to what United Electric could expend for coal reserves?

* * * *

[204] A Well, you had to put into the budget what you expected to spend. If you obtained a [205] lease on a property, you would not spend that amount. Therefore, it usually was under what we put in the budget.

BY MR. FUTTERMAN:

Q Mr. Inman, did you ever recommend that more money be spent for the acquisition of coal reserves than the company had budgeted?

A May I have that question back again?

MR. FUTTERMAN: Read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A My experience was that I had an open book on coal reserves.

BY MR. FUTTERMAN:

Q Was this during your entire term of employment with the company?

A Only when I was in control did I have that opportunity.

Q That would be since what date?

A 1964, December.

Q What do you mean by an "open book"?

A If I could come up with a reserve, I could spend the money.

* * * *

[218] MR. KEMPF: I have only a few questions, Mr. Inman.

CROSS EXAMINATION

BY MR. KEMPF:

Q In your opinion, will United Electric mine the deep reserves located at its Fidelity mine?

A No. I do not think so.

Q In your opinion, will anyone else mine the deep reserves?

A No. I do not think so.

Q In your opinion, will United Electric mine the reserves located at the King Hill area?

A No.

Q In your opinion, will anyone else mine the reserves at the King Hill area?

A No.

* * * *

[222] BY MR. KEMPF:

Q Mr. Inman, since 1960, until the time you left the company, did United Electric fail to acquire any reserves because of the refusal of the board of directors to allocate sufficient funds for this purpose?

A No, sir.

MR. KEMPF: I have no further questions on cross examination.

MR. FUTTERMAN: I have one or two questions on redirect, Mr. Inman.

REDIRECT EXAMINATION

BY MR. FUTTERMAN:

Q Mr. Inman, prior to 1960 did United Electric fail to acquire any coal reserves because of the recalcitrance of the board of directors?

MR. KEMPF: Will you read the question back, please, Mr. Youker.

Q (Read by the Reporter.)

MR. KEMPF: I think "recalcitrance" is a highly subjective word, and I would ask that counsel rephrase his question to give the witness a better idea of what the [223] question is designed to elicit. On that basis, I will object to it.

* * * *

[3]

EXCERPT FROM DEPOSITION OF JOSEPH TABOR TAKEN NOVEMBER 8, 1968

* * * *

JOSEPH C. TABOR,

called as a witness by the platintiff herein, having been by me, the said Claude W. Youker, Jr., as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. SIMS:

Q Would you state your name in full for the record.
A Joseph C. Tabor.
Q Where do you live, Mr. Tabor?
A 1304 Ivy Wood Drive.
Q In what city?
A Springfield, Illinois.
Q What is your occupation?
A Chief Clerk, Department of Mines and Minerals.
Q How long have you held this position?
A I have held the position of Chief Clerk since 1953, approximately fifteen years.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF THOMAS J. TARZY, TAKEN NOVEMBER 14-15, 1968

* * * *

THOMAS J. TARZY,

called as a witness on behalf of the Plaintiff herein, having been first duly sworn, was thereupon examined and testified as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.
A My name is Thomas J. Tarzy.
Q Your home address.
A 11035 Madison Drive, Sun City, Arizona.
Q What is your telephone number, please?
A Area Code 602-933-2177.
Q What is your present position, Mr. Tarzy?
A My present position is Vice President of Western Operations.
Q Of what company, sir?
A United Electric Coal Companies.
Q How long have you held that position?
A Since December of 1966.
Q Could you tell us something about your educational background after high school?
A Yes. I graduated from Stevens Institute [4] of Technology in 1935 with an M. E. degree, and did a little postgraduate work in power in plants in operations and design.

* * * *

[7] MR. HEDLUND: Business, you mean how [8] much of the coal that was sold was from West Kentucky?
MR. CUSACK: Right; coal they sold, coal they handled.

BY THE WITNESS:

A They handled any kind of coal that they could make some arrangements with, but primarily it was West Kentucky coal.

BY MR. CUSACK:

Q Were they in underground or in strip mining?
A Well, they represented mines, both strip and deep mined coal.
Q Was this coal steam coal or metallurgical coal or what kind of coal was it?
A Of course, back in those days there was still a substantial market for railroad fuel and so-called domestic fuel, and there was industrial fuel, and of course utility—it was all markets.
Q Did you sell metallurgical coal?
A No, we had no metallurgical coal.
Q When did you leave Southern Coal?
A I left Southern Coal in October of 1952 [9] to go to work for the United Electric Coal Companies as sales manager.
Q Was that about the time Southern was acquired by the Sinclair group?
A Yes, shortly after wards.
Q I see. And who hired you at United Electric?
A John Morris.
Q Had you known Mr. Morris prior to this time?
A Yes, I did, but not as a personal friend.
Q You were living in Chicago at the time that you came with United Electric?
A Yes.
Q And you were manager of operations, Southern's operations up here?
A Correct. I was manager of industrial sales, I wasn't the manager of their entire operations.
Q What were your duties when you first came to United Electric?
A Well, as sales manager, my principal duties at the time were to try to set up a marketing program for the sale of coal that was [10] going to come out of

the Ruby mine, which United Electric had made a sales arrangement with. The mine was not owned by United Electric, but was owned by Ruby, Edwin Ruby and some of his associates in Western Kentucky.

* * * *

[15] Q Well, now, we have been discussing some [16] of your duties after your activities with the Ruby mine, and you mentioned efforts to sell the Fulton County coal. Incidentally, you mentioned the problem was dump gasoline?

A Dump gas, natural gas, boiler gas.

Q Is this still a problem in the coal industry now in the Midwest?

A Not as severe, as I understand it. I have to go back to my experience while I was still in the Chicago area up to 1966, but the Chicago utilities particularly had begun to reduce the amount of dump gas that they were burning in the summer months.

Q Do you have an idea how much dump gas Commonwealth Edison Company burned, say, in 1965?

A No.

Q Would you consider it a large percentage of their total energy consumption?

A No.

Q Do you have any idea why there has been a reduction in the use of dump gas by public utilities?

MR. HEDLUND: Well, I think first you had better establish that that is true [17] generally for public utilities, Mr. Cusack, if this witness knows. If you want to direct a question to Commonwealth Edison, which he has testified to, that is all right.

BY MR. CUSACK:

Q Has there been a reduction in the use of dump gas by the public utilities located in Illinois?

MR. HEDLUND: Again, since 1959 are you asking him?

BY MR. CUSACK:

Q From 1959 to 1966 when he was in the Chicago area.

A I would think so because in the '60's there came the movement of the unit train concept of moving coal, which enabled a number of the coal producers to put together some packages with lowered transportation costs, which made them more competitive with the dump gas, and I believe that did encourage most of the utilities to switch to coal rather than adhere to the burning of the dump gas.

MR. CUSACK: Off the record.

[18] (There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. CUSACK: On the record.

BY MR. CUSACK:

Q Have the natural gas people been storing natural gas during the summertime in Illinois?

A Yes, I believe so.

Q Has this somewhat lessened their need, their necessity to dump gas?

A Yes.

Q What else, Mr. Tarzy, was involved in your duties at United Electric during the '50's? First of all, what was your title in the '50's?

A I came in as sales manager in 1952. I think I was appointed general sales manager in 1958.

Q Why don't we start with sales manager. Who did you report to as sales manager?

A Mr. John Morris, who was vice president of sales.

Q And who reported to you when you were sales manager?

A I presume the salesmen that operated— [19] I believe we had one salesman in the Chicago office, and we had several salesmen that worked out of our Peoria office, and I believe we had one salesman in the Twin Cities area. Then we had an office in St. Louis but that was more or less a separate entity during the period that I had first come with the company because it was under the head of vice president, a Mr. Sherrill down there, whose prime responsibility was to look after the sales of the Fidelity Mine in Belleville, and in the

early stages of my career with United Electric I had very little to do with Belleville sales. I did on occasion get involved in it, but it wasn't a prime duty of mine.

Q I understand United Electric had a salesman in Southern Illinois in the DuQuoin area, is that correct?

A Oh, yes. He worked, though, under the jurisdiction of the St. Louis office.

Q Under Mr. Sherrill?

A Yes. He handled our truck sales out of the Fidelity Mine.

Q Did United Electric have any other [20] salesmen that you recall at that time?

A We had a man that worked out of his home in Rockford, Illinois, and in the early days I believe we had a man that worked out of some place in Iowa, but he wasn't with the company for a period much after I got there.

Q Did you have a salesman in Wisconsin?

A No. The salesman who worked out of Rockford did cover the Southern Wisconsin territory for us.

Q Did your Chicago sales office handle Wisconsin business, too?

A Yes.

Q You had a sales office, then, is it correct, in Chicago, Rockford—

A No, not in Rockford.

Q Just a salesman there?

A Yes, who worked out of his home.

Q You had a sales office in Peoria?

A Correct.

Q And St. Louis?

A Correct.

Q And you had a man or salesman covering Iowa?

[21] A Let's see. No, I believe most of Iowa after that one man left was covered out of the Peoria office.

Q Then you had a sales office in St. Louis?

A Correct.

Q Who covered the Twin Cities?

A A man by the name of John Gagnon, and he covered the Twin City area for us.

Q Where did he live, Mr. Tarzy?

A I believe he lived in Faribault. He worked out of his house in Faribault, Minnesota.

Q That is a suburb of St. Paul, isn't it?

A I would have to look at the maps to find out.

Q But it is in Southeastern Minnesota, isn't it?

A Yes. It was accessible by car to Minneapolis, but I really don't know how far it was.

Q Did you have any salesmen in West Kentucky?

A No.

Q Who covered the sales in West Kentucky?

[22] A I did.

Q Out of Chicago?

A Yes.

Q That was in connection with your activities with the Ruby Mine?

A Correct.

Q Was that also in connection with your activities with the Buffalo Creek Mine?

A Yes.

Q What about Indiana? Who covered sales in Indiana, if anyone?

A I think, if there was anything involved in Indiana, I believe that would be handled out of the Chicago office.

Q Now, then, you testified you became general sales manager of United Electric?

A Yes, in 1958, I believe.

Q Was this at Mr. Sherrill's retirement?

A No. Let me see, I think this was occasioned by our hiring a young man by the name of John Dowdle who was made manager of industrial sales, and who worked directly under me.

Q So this was really a title—

A Just a title realignment, you might say.

[23] Q I see. You still continued to report to Mr. Morris?

A Yes, sir.

Q Did you report to anyone else in the company or consult with anyone else in the company, any of the officers?

A Oh, Mr. Kolbe, our President, on occasion would maybe want to know a thing or two when Mr. Morris

was out of town, and he would probably come into my office and ask me about this or that. But primarily, well, my duties were to report to Mr. Morris.

Q How long, Mr. Tarzy, were you general sales manager?

A General sales manager until, well, I remained general sales manager but was promoted to vice president in, I believe, January of 1959. I think the record would probably show that. I continued along with my duties as vice president and general sales manager.

Q Whom did you report to?

A Mr. Morris.

* * * *

[29] Q Was that in December of 1966?

A Yes.

Q What areas did these salesmen out of Peoria cover in the period 1960 to 1966?

A I would say they would cover what we would consider the market for Fulton County coals.

Q What would that be?

A Well, Fulton County coals had a rather narrow market area as its natural market, and we used to describe it as possibly within a 50-mile radius of Peoria. But that is very rough, of course.

Q Is that what you mean by natural market?

A Yes.

Q And they called on customers within that 50-mile radius?

A That is right.

Q Do they call on any customers in Iowa?

A Yes.

Q Out of the Peoria office?

A Yes.

[30] Q Did they call on any customers in Southern Wisconsin?

A I do not believe so. I believe that was handled by Darby out of Rockford.

Q And was from the period 1960 to 1966?

A Yes.

Q Do you know whether Mr. Darby is still employed by United Electric?

A Let's see. He was in 1966, but I believe he was on the verge of retirement. I don't know.

Q Do you know who assumed his duties, if he did retire?

A No, I wouldn't know.

Q Directing your attention to the period 1960 to 1966, what was the setup in your St. Louis office?

A This is for what period now?

Q From the period 1960 to 1966.

A The St. Louis office, now we get to the point where we have to check the records to see when Mr. Sherrill retired, and on Mr. Sherrill's retirement we hired a Mr. Robert Croak to run our St. Louis office.

Q Who else was in the St. Louis office?

[31] A Well, in the St. Louis office at that time was Mr. Merkle, who was a salesman that worked out of the St. Louis office, and they had an office man there by the name of Mr. Hargate, and of course a supervisor of the work, a Mr. Blanchard who was our manager that handled the truck sales out of the Fidelity Mine.

Q Did Mr. Blanchard work out of DuQuoin?

A I believe he lived in Tamaroa, Illinois, but worked out of the truck dock at Fidelity Mines.

Q Did he work out of his home or did he have an office?

A He didn't have an office. He must have worked out of his home.

Q Did the St. Louis office from the period of 1960 to 1966 continue to cover the West Kentucky business?

A Well, let's see—

MR. HEDLUND: I am sorry. I am not certain I understand that question, Mr. Cusack. By West Kentucky business, you mean sales to consumers in West Kentucky?

MR. CUSACK: Yes. I believe Mr. Tarzy [32] testified that from the period prior to 1960 the St. Louis office was responsible—

THE WITNESS: For the Fidelity Mine.

BY MR. CUSACK:

Q And some of that coal went to West Kentucky, is that correct?

A No, I didn't say that.

MR. HEDLUND: I didn't think so. You used West Kentucky business before to refer to coal being produced or being sold that was produced by the company or by Ruby in West Tennessee.

BY MR. CUSACK:

Q I see. Who did cover West Kentucky from 1960 to 1966 for United Electric?

A Now we would have to go back to the record and refresh our memory again, but the Ruby Mine ran out of strip reserves somewhere in that period, the late '50's and early '60's, and so did Buffalo Creek Mine, so we just ran out of any coal to sell out of West Kentucky, so there was no sales activity down there.

Q Did United Electric continue to sell coal in West Kentucky?

[33] A Well, I don't know what you mean by that.

Q Did the Fidelity Mine supply any coal for the TVA facilities in West Kentucky?

A Yes. I see what you mean. Yes.

Q Who handled that account?

A I did.

Q All right. Directing your attention then from 1960 to 1966 during which period of time you were vice president of sales, right?

A Yes.

Q Of United Electric, what customers did you call on?

MR. HEDLUND: Are you asking him personally?

MR. CUSACK: Yes, Mr. Tarzy personally as the sales vice president.

BY THE WITNESS:

A You mean in the entire, our entire sales efforts, who did I call on?

BY MR. CUSACK:

Q Yes, sir. I realize that is a long question but if you could tell us, I would appreciate it.

[34] A Shall I tell you the principal ones?

Q Why don't we start with the principal ones?

A Well, since the United Electric's business was primarily aimed at utilities and large industrials, I think it is pretty easy to. I called on, in the '60's, now, I called on Northern States Power in Minneapolis. I called on—

Q Just a moment, sir. Who did you usually call on at Northern States Power? What was the name of the Northern States Power official that you usually called on?

A I believe a Mr. Vince Frawley was the manager of fuel supply.

Q Did United Electric supply Northern States power?

A Yes.

Q What generating stations of Northern States Power did United Electric supply?

A Their river stations.

Q Could you give us the names of those, please, sir?

A Yes. There was Black Dog, St. Paul, [35] Riverside, Redwing, Edison, Winona—there might be a few others, but it was just the river plants that they had located on the Mississippi River.

MR. CUSACK: I think your memory is excellent, but would it be helpful to look at these Coal Buyers in answering some of these questions?

MR. HEDLUND: Mr. Cusack, it seems to me that in this area of where did the coal go, the best evidence of that is the records of the company, presuming, of course, that they still exist, and I would assume that they do. I think if you continue this with every customer he called on, we may be taking a lot of time unnecessarily.

MR. CUSACK: Well, I realize that, but the difficulty, of course, is that we do not have this information as yet. We realize that you have promised you would submit it to us.

MR. HEDLUND: You will have it, Mr. Cusack, yes.

MR. CUSACK: Our problem here is that [36] we haven't received it yet, and I am confident it will be forthcoming eventually, but I just thought we would go through this very shortly.

MR. HEDLUND: O. K., if we can do that. I just think we may be taking up time unnecessarily to go through a lot of details.

MR. CUSACK: I understand, but Mr. Tarzy was the sales vice president, and we don't want to have to bother to bring him back to explain any of the materials perhaps that were sent, and I thought he might be able to give us this on really a shorthand basis which may be helpful to both parties.

MR. HEDLUND: I think with respect to Northern States, he said the river stations, and there may be ten of them.

MR. CUSACK: Right. Sure.

BY MR. CUSACK:

Q Would it be helpful, Mr. Tarzy, in answering some of these questions, to look at the Keystone Coal Buyers Directory of Public Utility Plants?

MR. HEDLUND: I suppose that would [37] depend on the question asked.

BY THE WITNESS:

A Not Particularly.

BY MR. CUSACK:

Q All right, fine. Your memory on this is pretty good, isn't it?

A I hope it is, but it has been about two years, and it is surprising how much you can forget in two years particularly when I am working on an entirely different type of project out there.

Q Mining coal in the mountains, right?

A That is right, and plateaus.

Q Actually I would rather get to that first, because it is more interesting in a way.

Mr. Tarzy, the coal that United Electric sold to Northern Power during the time you were vice president in charge of sales, where was this coal from?

A Fidelity Mine from the Belleville district.

Q All of it?

A Well, our contract called for the coal to be shipped out of the Fidelity Mine.

Q Did you ever substitute any Fulton [38] County coal?

A On very rare occasions. It would strictly have to be an emergency proposition.

Q Did you ever use Freeman coal to supply these contracts?

A No, I do not believe so.

Q Who else did you call on, other than Northern States Power?

A Let's see. I called on Interstate Power Company at Dubuque, Iowa.

Q Who did you call on at Interstate Power?

A Mr. Don Carlson.

Q Was he vice president in charge of fuel purchasing?

A I can't remember his exact title.

Q Did United Electric supply coal to Interstate Power?

A Yes, sir.

Q For what plants, sir?

A The Lansing plant.

Q Was that located in Iowa?

A Yes, Lansing, Iowa.

Q Is that on the river?

A Yes.

[39] Q The Mississippi River?

A Yes.

Q Any other plants?

A I think we shipped some minor quantities of coal to their Beaver Channel plant which was located near Dubuque.

Q Was that a river plant?

A Yes.

Q Any other plants?

A They had one other plant, I can't remember the name at the moment, but we shipped a very small quantity of coal there. The primary or the bulk of our shipments went to the Lansing, Iowa plant.

Q Where did this coal come from?

A It came from the Fidelity mine.

Q Is this barge coal?

A Yes.

Q Incidentally, the coal that went to the Lansing plant of Interstate Power and to the river plants of Northern

States Power from the Fidelity Mine, how did this get on the river from the Fidelity Mine?

A Well, originally we shipped the coal by [40] rail from the Fidelity Mine to the Ford dock of the Missouri Pacific Railroad, and the latter stages of my stay in Chicago, we had made arrangements to ship this river coal to the Kellogg dock.

Q Is that located on the Illinois River?

A Yes, it is.

Q On what rail line did the coal move from the Fidelity Mine to the Ford dock?

A Missouri Pacific Railroad.

Q What rail line did the coal move from the Fidelity Mine to the Kellogg dock?

A Missouri Pacific Railroad.

Q The same line?

A Yes.

Q The same rail line?

A The same railroad. Now if you were going to get into divisions, different divisions of different railroads—it was the same railroad.

Q But moved on different tracks?

A Well, I think it would have to because it was two different locations. But the divisions, I really don't know.

Q I understand. I am just trying to [41] determine whether or not it was the same rail tracks.

A Well, I recall something about coming off a different division. You know how these railroads are. This might be the Kellogg Division and the other might be the Ford Division, but it was the same railroad company.

Q Why did you transfer your business from the Ford dock to the Kellogg dock?

A Because we could make a lower transportation cost.

Q Who else did you call on other than Interstate Power and Northern Power?

A The Dairyland Power Cooperative located at La Crosse, Wisconsin.

Q Was that a river plant?

A Yes.

Q And where did this coal—

A No, that was their general offices. Their plants were located upstream from there or downstream from there. They had several plants.

Q Two or three?

A Yes.

[42] Q Where did this coal come from?

A From the Fidelity Mine.

Q Who did you call on at Dairyland Power Cooperative?

A Mr. Norm Moser and a Mr. John Madgett.

Q And who else did you call on then?

A You are talking about now generally?

Q From 1960 to '66.

A Let's see. I called on the Union Electric Company.

Q Is that headquartered in St. Louis?

A It is headquartered in St. Louis, and I called on a Mr. Mark Covell and a Mr. Stricklin.

Q Did United Electric supply coal to the plants of Union Electric?

A Yes.

Q Which plants, sir?

A Primarily the Merrimac plant which was located on the river.

Q The Mississippi River?

A Yes.

Q That was north of St. Louis?

A South of St. Louis.

Q And what other plants?

[43] A Well, we did have some occasional shipments, they had some plants on the east side of the river which were rail shipments, but we were primarily interested in the barge movement of coal, and I would say to all intents and purposes most of our coal went to the Merrimac plant.

Q Where did this coal come from?

A From the Fidelity Mine.

Q Who else did you call on? You said you called on TVA. Perhaps we could do that one now.

A Oh, yes. I called on a Mr. E. C. Hill at TVA. I think he was—

Q In charge of fuel procurement?

A Yes, in charge of fuel procurement.

Q And this was in Chattanooga?

A Yes, Chattanooga, Tennessee.

Q What plants of TVA did United Eelectric supply?

A Well, as I mentioned previously we sold the coal to them f.o.b. mine, and they shipped the coal to whatever locations they could reach from the mine.

Q Did you have any knowledge of where they did ship it to?

[44] A I think I testified previously that it could move to the Shawnee plant, the Johnsonville plant, and the Colbert plant.

Q In fact, United Electric did supply coal to the Shawnee plant, did it not?

A Yes.

Q And to the Colbert plant?

A It was hard for us to know where the coal was going to wind up after they took possession of it at the mine and they would give us shipping instructions as to which plant to ship it. It could apparently start out with a shipment, say, to Shawnee, and then be diverted somewhere else at their discretion because they owned the coal f.o.b. mine in the car.

Q But you do know that United Electric did supply an awful lot of coal to the Shawnee plant, is that correct?

A I don't know what you mean by an awful lot, but I think whatever we shipped there that we had under contract with them, I would say, and I am stretching my memory again, I would say most of it went to the Shawnee plant.

Q Do you know of any other plants that [45] United Electric coal went to, which plants were operated by TVA?

A No.

Q Who else did you call on?

A Let's see. I called on Wisconsin Power and Light.

Q Where are they headquartered?

A Their headquarters are in Madison, Wisconsin.

Q What plants did United Electric supply there?

A We supplied their Nelson Dewey plant located at Cassville, Wisconsin, on the Mississippi River.

Q Any other plants?

A I believe that was their only plant on the Mississippi River, but we also, back in the old Ruby days, did ship them some of the Ruby coal to their Blackhawk plant located in Southern Wisconsin.

Q Who did you call on at this utility?

A Well, when I originally called on them, it was a Mr. Everett Chandler who was their purchasing agent, and after he retired, I called [46] on a Mr. Hodgson and a Mr. Abrahamson.

Q Where did the coal come from that was supplied to this utility?

A From our Fidelity Mine, in the case of the Nelson Dewey plant. Back in, of course, in the '50's, when we had the Ruby Mine, why, the coal for the Southern Wisconsin plants came out of the Ruby Mine.

Q Did any of the mines at Fulton or Peoria supply any of the coal requirements of this utility?

MR. HEDLUND: Talking about the Wisconsin Power and Light?

MR. CUSACK: Yes.

BY THE WITNESS:

A I think in an emergency case, at one time I think we did ship some Banner coal up there. But you would have to check the records on that. I recall at one time in our efforts to try to help the utility in getting some reductions in rail freight rates that we utilized the all-water capabilities of the Banner Mine to show the railroads that transportation costs could be lowered by using other methods of transportation. But that was strictly, I would say, an emergency [47] movement or, you might say, a trial movement.

* * * *

[76] Q Where is that located?

A It is located near Danville, Illinois.

Q Are there any other plants of Illinois Power that United Electric supplied coal to?

A They did have a plant at Wood River, Illinois, to which we made an occasional shipment, but it was very occasional.

Q Did Freeman supply coal to the Wood River plant of Illinois Power?

A Well, I believe the Wood River plant at the time I was there was supplied by most of the southern Illinois producers, and I would presume that Freeman did ship them some coal. I am quite sure they did, because all of the Southern Illinois producers, I believe, did ship them some coal.

Q Was that rail transportation?

A Yes.

Q Directing your attention from the period 1960 to 1966, did you sell any coal to Freeman Coal Mining Corporation?

A Yes.

Q Who handled these sales for United Electric?

[77] A I presume I would handle some of them, and possibly Ed Butler would handle some, and I believe that would be about it. There might be some occasions where maybe the shipping clerks might have gotten involved, but primarily—is that what you are looking for?

Q Yes; sure.

A (Continuing) It would be natural for them to come to the sales department to try to buy some coal.

Q Who did you call on at Freeman?

A Let's see. Most of my contacts there in connection with the buying and selling of coal would depend on what account would be involved. In some cases it might be, maybe, Mr. Gebhart or Mr. Riley or possibly, in Mr. Butler's case, maybe possibly Mr. Riley again, who I think was their general sales manager at the time. I think he retired prior to my leaving, though.

Q And this coal that United Electric sold to Freeman, do you know what facilities of Freeman it went to, or what customers of Freeman it went to?

A I would have to check the record on [78] that.

Q Do you have any recollection of where it would go?

A Well, let's see. Oh, I would say possibly the one thing that would have been involved was probably the

TVA business. The records would show, and I think possibly that might have been the biggest piece of business that might have been involved between us, at least that is my recollection.

Q Was TVA used to backstop United Electric sales to TVA, or was United Electric used to backstop Freeman sales to TVA?

MR. HEDLUND: I don't understand the question, Mr. Cusack, in the terms of backstop.

BY MR. CUSACK:

Q Do you understand what the term is?

A No. Would you repeat that?

MR. HEDLUND: Are you asking him whose contract the coal was shipped on?

MR. CUSACK: Right. Whose contract was the coal shipped on, the United Electric coal shipped through Freeman or sold through [79] Freeman?

BY THE WITNESS:

A I think I know what you mean now. Freeman did have a contract with TVA, and they allowed us to ship some coal on their contract or made arrangements for us to ship some coal on their contract.

BY MR. CUSACK:

Q In other words, you got a part of the Freeman business?

A Well, I—

MR. HEDLUND: I am going to object to that characterization. I don't understand what you mean by that characterization, and therefore I object to it.

BY MR. CUSACK:

Q What plant of TVA did Freeman supply on this contract which United Electric shared?

A Well, most of the coal shipped out of Illinois would go to the Shawnee plant.

Q So this would be involved in the Shawnee plant?

A That is correct.

Q But United Electric also had a [80] contract with TVA to supply coal to Shawnee?

A Now you have to go back to the original thing that I talked about. When we first had the Ruby Mine back in the '50's—what period are you talking about now?

Q 1960 to 1966.

A 1960 to 1966, I think in the early '60's we were just about phasing out the Ruby Mine and the Buffalo Creek Mine, and we had our own contracts and we shipped our own coal. After the mines phased out, I don't believe we ever took another direct contract from TVA. That is, United Electric.

Q Right. But you did sell coal via Freeman, is that a fair statement?

MR. HEDLUND: If you said delivered or shipped?

BY MR. CUSACK:

Q Shipped coal.

A We shipped coal at Freeman's request—or not request. Let me say this. Do you want me to put it in my own words?

Q Certainly, please.

A When we needed help, when United Electric [81] needed some help to get rid of some of their so-called left-over production or coal that we produced that was kind of odd sizes and sizes that couldn't move anywhere else, we would ask Freeman's help to let us ship it on their TVA contract, and whenever they could do that for us and could help us, they would.

Q All right. Now, we have already talked about the Wisconsin Power and Light Company, Interstate Power Company. Did you call on Corn Products Company?

A I did call on them once or twice, but that account was primarily handled by Mr. Ed Butler.

Q I see, and where was this coal shipped to from United Electric mines?

A It was shipped from the Cuba Mine in Fulton County to the Corn Products plant at Pekin, Illinois.

Q Was this by rail?

A Yes.

Q Did you ever call on anyone at Linde Company, a subsidiary of Union Carbide Corporation?

A Yes.

[82] Q Who did you call on there?

A I can't remember his name, now.

Q Where did United Electric ship the coal; to what facility of Linde did United Electric ship the coal?

A I remember his name now. His name is Howard Kessler.

Q To what plant of Linde did United Electric ship the coal?

A Their East Chicago plant, East Chicago, Indiana.

Q Was this a generating station or was this a processing plant?

A I believe they did generate some of their own power.

Q Where did the coal come from?

A From the Banner mine, and on some occasions we had shipped them some Buckheart coal.

Q By rail or barge?

A Via barge.

Q The Banner coal would come up by barge from Fulton County?

A Correct.

Q How would it get to East Chicago?

[83] A It would be taken out from South Chicago and hauled across the opening into Indiana Harbor. Do you understand how that works?

Q No, sir.

A The river, the South Fork of the Illinois River does not directly connect with Indiana Harbor, so in order to get to Indiana Harbor, you have to go out into the lake, and then try to come down just a very short distance of the lake, and back into the little canal in Indiana Harbor.

Q Did it go up solely by barge?

A Oh, yes.

Q You didn't have to transfer?

A No, it was in the same barge.

Q Do you know who else supplied coal for the East Chicago plant of Linde?

A No, I don't.

Q Do you know whether Freeman supplied any coal for that facility?

A I don't believe so.

Q Did you sell any coal to Illinois Coal and Docks Corporation?

A Yes.

Q What is the Illinois Coal and Docks [84] Corporation, do you know?

A Well, you are getting into an area there that I am not too familiar with, because Illinois Coal and Docks was, as I recall it, primarily concerned with the Central Illinois Light Company business, and as I previously said, that was handled primarly by Mr. Morris.

Q I see. Well, is it fair to say that Illinois Coal and Docks Corporation supplied the Peoria plants of Central Illinois?

A I believe they did.

Q All right. And what mine was served by United Electric? What mine of United Electric served the Peoria plant of Central Illinois?

A The Cuba mine, primarily.

Q And that was rail coal also?

A Yes.

Q Did United Electric from 1960 to 1966 sell any coal to the Crerar-Clinch Coal Company?

A Yes.

Q Who did you call on there?

A That account was handled—that account wasn't handled by me personally. It was handled by Mr. Butler and Mr. Gilhaus. I did make an [85] occasional call in there, and the fellow I talked to was—I just can't remember his name now. It was a small account and it is kind of hard to remember those names.

Q I understand. What kind of coal, or what does Crerar-Clinch use this coal for?

A Crerar-Clinch was what we classified as a retail coal company in the Chicago area, and they did have a retail coal dock that was equipped to handle barge coal.

Q Would this be where United Electric would deliver its coal?

A We would sell them the coal in a barge normally that they would supply to us. In other words, they made arrangements for their own barging. So it was just like selling somebody coal f.o.b. car or f.o.b. barge.

Q Where would this coal come from?

A It would come from Fulton County. In the case of Crerar-Clinch, since it was a retail coal company, that probably was Banner coal because Banner coal was the type that would probably apply to this kind of business.

Q The higher quality coal?

[86] A That is right.

Q But it would move by barge from the Banner Mine?

A It would have to. Well, you know the situation at the Banner Mine, it is located right on the river and it does not have any rail facilities.

Q Yes, I understand. Isn't it a fact that the Banner Mine is the only mine in the country that is located right on the river?

A I think we used that in our original advertising, but I think we can find that because it is kind of hard to know what everybody in the country is doing. But in checking our records and trying to set up our advertising program, we did claim that it was the only mine in the midwestern area that is so located.

Q Do you know of any other mine in the midwest that does have or that is located directly on the river?

A No.

Q In fact, isn't the Banner mine processing plant located on the river and the tipple is on the river, isn't it?

[87] A Exactly.

Q So it loads directly on a barge?

A The coal goes from the preparation plant into three storage silos, and from there, when the barges are available, they are unloaded from the side over a belt into the barges.

Q And the Banner Mine is a fairly unique mine by having these facilities, is that fair to say?

A Yes. By unique, you mean there aren't too many like that. It is not an ordinary type of mine.

Q Right. Do you know of any other mine in the Midwest that does have these facilities?

A There are some that approximate these facilities. You go down into Western Kentucky, for instance, the Uniontown Mine of the Island Creek Coal Company, which used to be the West Kentucky Coal Company, they used a conveyor belt that might be several miles long to load the coal from their preparation plant into barges.

It is a relative thing. The DeKoven Mine of the Pittsburgh Midway Coal Company was a [88] river loading mine down there in West Kentucky, but they had to use a belt possibly several miles long to get into the barge. Do you get my point? So we were unique in the point that we had just a short belt loading facility into the barge. But other people could do it.

Q But it would be a longer distance.

A It would be a longer belt haul to the river, but the fundamental idea of barge loading has been used for years.

Q Yes. You used it at Liverpool.

A That is another good example, except in that case, instead of a belt, we use the Buckheart Railroad. You see?

Q I see.

A So the idea is not unique, if that is what you meant by that word. The idea is as old as the hills.

Q No, I was saying isn't the Banner Mine unique in the fact that it is the only mine with a processing plant on the river and goes immediately to barge transportation.

A In that case, that is correct.

Q And this makes it a highly profitable [89] mine, does it not?

A Well, let's see. What do you mean by highly profitable? You would have to refer to something else. We did have some years while I was there at the Banner Mine where we ran into some kind of bad operating conditions and we didn't consider it a very profitable mine. But I would say when things were going right, production was right, and we had the coal sold at the right price and everything was going, you know, along smoothly, the very fact that we were located right on the river and had no transportation costs to get to the river would make it a potentially profitable mine.

Q Has United Electric's Banner Mine overall been profitable?

A The Banner Mine?

Q Yes, sir.

MR. HEDLUND: I don't understand what you mean by overall.

BY MR. CUSACK:

Q Well, I believe the testimony was that the Banner Mine was started in 1960, is that correct, Mr. Tarzy?

[90] A Around that time, yes.

Q And from the period of 1960 to the present time, if he knows, or at least from the period 1960 to 1966, when he was headquartered in Chicago in charge of sales, does Mr. Tarzy know whether or not the Banner Mine was profitable?

A Oh, it made a profit every year.

Q Can you tell us what the profit was on a per ton basis?

A No.

Q Do you have any idea?

A No. It varied.

Q Would it be over a dollar a ton?

A Now, if you are talking about a period of a month or something like that?

Q No. Let's do it for the year 1965. Do you know whether or not the Banner Mine in the year 1965 had a profit of a dollar a ton?

A I couldn't tell you. I think the records would show that. I wasn't the financial man in the company and my job was to try to sell the coal at the highest possible realization that we possibly could, and it was up to the production department to produce it at as low a cost as they [91] could, and the difference was a profit.

Q And you were both successful in this endeavor, weren't you?

A I hope so. We felt as the sales department that we were at least doing our part of the job. So, I mean, you would have to ask somebody that knew the whole story to answer your question properly.

Q I understand. Mr. Tarzy, did you also call on the Commonwealth Edison Company?

A Yes, I did.

Q Who did you call on there?

A There were several people. The first one I probably called on was Mr. John Brownlee. The second one was—

Q Glen Beaman?

A Beaman was the principal one. I could go back. They had several fuel agents, as they call them, you know, over the years, but it finally resolved during the period that I had anything to do with it to Mr. Glen Beaman, and he had an assistant by the name of Mr. Norm Wandtke, I believe it was, that I called on.

Q Was United Electric successful in [92] supplying Commonwealth Edison with coal?

MR. HEDLUND: May I have the question read, please?

Q (Read by the reporter.)

MR. HEDLUND: I don't understand the question. You are asking did they sell coal to Edison?

THE WITNESS: I think that is what he means.

MR. CUSACK: Yes.

BY THE WITNESS:

A This matter of success is a relative thing, you know. Sometimes I would go into my boss and say, well, gee whiz, we did a pretty good job, and he thought it was a successful job. I would go in maybe six months later and I would say we didn't get this particular job, we weren't successful, and of course, he would say what have you done lately, you know, that sort of thing. So this matter of success is a relative thing.

BY MR. CUSACK:

Q But United Electric did and does sell Commonwealth Edison coal, do they not?

[93] A At the time I was there they did. We were shipping Commonwealth Edison coal.

Q Up to December, 1966?

A Right.

Q Could you tell us the generating stations of Commonwealth Edison which United Electric supplied?

A Their river stations.

Q Could you give us the names of those, if you recall, please?

A Well, let's see. Will County, Ridgeland, Fiske, Calumet and Northwest. I believe those latter two stations are phasing out so that they are minor items, or they were at the time I was there.

Q Do you ship any coal to the Joliet station of Commonwealth Edison, or is this the same as the Will County station?

A No. Will County and Joliet stations are separate stations. Now what period are you talking about?

Q 1960 to 1966.

A Yes. Prior to the time that they put in a unit train facility at Joliet, yes, we did [94] ship coal by barge to the Joliet station, the old Joliet station.

Q Did you lose that business to Southwestern Illinois?

A We lost it to unit train business.

Q From the Captain mine?

A Let me add this. When you say lost business, because of Commonwealth Edison's versatility in receiving barge coal, the coal that I would assume we would have normally shipped to the Joliet station by barge maybe wound up at Will County, Ridgeland or some place else.

Q Directing your attention to 1966, what stations of the Commonwealth Edison did United Electric ship some coal to?

A In 1966? I would say Will County Ridgeland and Fisk.

Q Where is the Will County station located?

A It is in Will County on the Illinois River.

Q And the Ridgeland Station is located in Chicago?

A In Chicago.

[95] Q On the Sanitary Ship Canal?

A Well, we used it—we used to call it all the Illinois River.

Q But on the water?

A Yes, on the Illinois Waterway. That is a good way to put it.

Q Where is the Fisk station located?

A That is in Chicago also on the Illinois Waterway.

Q Mr. Tarzy, do you know whether Freeman supplied coal to the Fisk station of Commonwealth Edison Company in 1966?

A No, I wouldn't know.

Q Do you know whether they supplied any coal to the Ridgeland station?

A No, I wouldn't know. If you are driving at whether I knew they shipped some coal that was supplied to some river stations of Commonwealth Edison, is that what you are driving at?

Q Yes, sir. They did ship to river stations, then?

A Yes, that is right.

Q Has United Electric over the period of [96] years that you were at United Electric located here in Chicago, has it at one time or another supplied all of the river stations of the Commonwealth Edison Company?

A That is a tough question. I just got knowledgeable about the Commonwealth Edison Company in recent years, you know, since the time that I began to handle the account.

Q Let me put it this way: Other than the Joliet stations?

A Yes.

Q The Will County station, the Ridgeland station, and the Fisk station, does Commonwealth Edison Company have any other generating plants located on the Illinois Waterway?

A I mentioned Calumet and Northwest.

Q Oh, right. Has United Electric shipped to Calumet?

A Yes.

Q And to Northwest?

A Yes.

Q To Will County?

A Right.

Q To Joliet?

[97] A Yes, sir. That is prior to the unit train.

Q Right. And to Fisk?

A Right.

Q And to Ridgeland?

A Right.

Q And you also testified that you know that Freeman also supplied the Illinois Waterway generating stations of Commonwealth Edison Company?

A Some of them. I don't know which ones.

Q I understand. Mr. Tarzy, were you responsible for United Electric entering into a large contract with Commonweath Edison Company to supply Commonwealth Edison Company with coal?

A You are talking about the last contract we had made with them?

Q Yes.

A Yes, sir.

Q When was that contract entered into?

A We negotiated the contract, well, actually, it was a renegotiation of an existing contract, and we renegotiated it during June of 1962, to be effective on January 1st, 1964.

* * * *

[108] It looked like we were going down a dead end. It did seem to us that eventually we would have to get some deep mine coal somewhere. I mean, if you wanted to stay in the coal business, you had to get coal, and if there wasn't any strip coal available, you would have to get deep mined coal. To us, or it seemed to me, that this kind of an association we had with Freeman Coal Mining, who were already established in the deep coal mining business, it seemed to be kind of a fortunate thing to have happen to us. Either that or else we would have had to associate with somebody else that knew how to mine deep coal or else, failing that, try to get into the deep coal mining business ourselves.

But that, you know, is a pretty tough business unless you know what you are doing.

Q Based on what you take to be and to have been the condition of United Electric, that is, the condition of its personnel, the condition of its sales, the cash flow of the company, the profitability of the company, the customers of the company, the future demand for coal, do you [109] believe that United Electric by itself would be able to go into underground mining?

MR. HEDLUND: Have you finished your question?

MR. CUSACK: Yes.

MR. HEDLUND: It is a very long question. I would like to hear it read.

Q (Read by the reporter.)

MR. HEDLUND: I think that is a very involved and long question, Mr. Cusack. I think it is a very difficult one to understand completely in order to answer it. I would like to see you rephrase it, but I won't object to it if the witness understands the question.

BY MR. CUSACK:

Q Do you understand the question? Let me give you the basis for my question.

A Didn't I answer it previously, though? Well, go ahead, ask your question.

Q Assuming United Electric had the profitability and the cash flow that it has at the present time, assuming that it—

A Don't say at the present time. Say when [110] I knew something about it, back in 1966.

Q All right. Let's take the question back to 1966. Assuming the profitability of United Electric as of 1966, that is the cash flow, depreciation, depletion, net profitability, assuming the sales of United Electric—

A Yes.

Q —assuming the personnel of United Electric or the personnel available to United Electric, assuming that the demands for coal remain at least as great as it was in 1966—

A Yes, That is an assumption.

Q —do you believe that United Electric by itself could go into the underground mining business?

A Well, you are asking for an opinion there. You mean I can hazard a guess?

Q Yes, sir.

A We were strictly a strip mining company. I mean, that is obvious. We have been in the strip mining business I don't know how many years, 30 or 40 years. To my knowledge we didn't have anyone in our organization that was familiar with the deep mining practices

and was even assigned [111] that kind of a project. You would just have to start from scratch.

Q I understand, but you—

A And to start from scratch to build a deep mining organization, I would say would probably be—I wouldn't say it would be impossible, but it would be probably one of the toughest jobs anybody could try to take on. You see, the strip people, as we were, are just naturally afraid of underground coal. I mean, this is a natural instinct.

Q There is a certain antagonism between the two schools of thought?

A Not antagonism. We are afraid. If you told me, if I were vice president in charge of sales and you told me that starting tomorrow you can't do what you are doing, we are going to send you down to train to be superintendent for an underground mine, I would say, "Uh-uh, I am on may way. Just get another boy."

I mean it is a, well, deep mining from the standpoint of a stripper is a hazardous business. You have got to know what you are doing. You have got to be knowledgeable and I [112] would say from my—well, I couldn't do it. Mr. Morris couldn't do it.

Q But you were a salesman anyway, weren't you?

A Yes, but I am an engineer originally by training.

Q But that is in regard to the boiler end of the business, the engineering end of the business, isn't that right?

A When I was with Southern Coal Company, I was assigned in some technical aspects to go down to the deep mines to help them out with their preparation problems. I was associated with deep mines, and every once in a while I had to go down into the mines just to see why the coal was coming out maybe in poor quality out of the preparation, maybe the fellow down in the mine was digging, say, in the floor of the mine and he was taking too much of the mud, so to speak. So I knew enough about it. But I just couldn't wait, every time I went down into a deep mine, I couldn't wait to get out of it.

So I am familiar with the problems that they do have in a deep mine and it is [113] specialized. Strip mining

to us is an easy occupation as compared with deep mining. It takes specialized knowledge and experience to do it. We didn't—as far as I was concerned and the people that I knew in United Electric, we weren't prepared.

Q Well, do you think that United Electric would be able to acquire competent personnel to supply the technological knowledge to go underground by itself?

A That would be tough. Money talks, you know. I don't know what your present job is now, but if somebody came along and offered you $25,000 a year more to go to work for somebody else, would that tempt you?

Q Yes.

A All right. Then in my case it is the same way and the same case with mining personnel. Good mining people are hard to get because of the nature of the business. It is a specialized profession.

* * * *

[119] BY THE WITNESS:

A It is kind of—I think I know what you are driving at.

BY MR. CUSACK:

Q I mean, you are going to have to tell me the variables. I am not going to give a hypothetical and say based on the opening of a new coal base, but what in your opinion—

A I understand. As of 1966, before I was transferred out west, this is the way we looked at the picture. Our Cuba Mine was facing extinction in a matter of just a few years.

Q What would that be, five years?

A Well, I think at the time there was a question—at the time I left there was a question of picking up some acreage, but anyway, it was adjacent to the Cuba Mine, and it was a variable piece of acreage, and if they could

have [120] picked that up, and I hope they have been able to, they could have extended the life of the mine maybe —and I am getting at figures again, but this is what you want, some kind of approximation?

Q Yes.

A I would say maybe six years or something like that. Failing to get that, I think it was a matter of two or three years before the Cuba Mine was going to be dead. So then from the standpoint of sales, and this is what my concern was, how are we going to take care of the customers that we were shipping Cuba coal to.

Well, then we thought, well, we do have some. The Buckheart reserves are larger than the Cuba reserves, not much larger, but say they had maybe ten years to go or something like that, so we will try to arrange our preparation plan and take care of our Cuba customers out of the Buckheart plant.

All that would do, of course, is to make Buckheart go out faster, you see. If that took Buckheart coal then to go on the rail business, we would have to try to back Banner in to take care of our river accounts, so we were [121] getting ourselves in an ever tightening circle. By manipulation, taking care of certain customers this way or that way, maybe we might have lasted, I don't know, in Fulton County—I am still guessing, right?

Q Yes.

A —maybe five years, ten years at the outside, maybe. Does this answer your question?

Q What about the Fidelity Mine now?

A Well, the Fidelity Mine, and this is all recollection again, their reserves were fairly similar in size, I think, to the Buckheart reserves, and I would say the same situation would apply there, although we didn't have the flexibility there that we had in Fulton County.

In Fulton County we had three mines to kind of juggle back and forth. If we couldn't take care of them out of Cuba, say this week the Cuba Mine was down, you could take care of the coal out of Buckheart or on the river, Banner. But in Belleville where we only had the one mine, it was that mine, and when that mine was petered out, we are done.

* * * *

[127] So we considered since we had, well, at that time, we had the Commonwealth Edison [128] contract, we had a good backlog of river business, and if we could make the economics work out, try to get the Industry coal down to the river, put it in barges and substitute it on our Buckheart or Banner contracts. I mean it is a natural.

Well, failing to get coal down closer to the river where you didn't have to build a railroad or a conveyor or whatnot for 20 miles, a minimum of 20 miles, you couldn't get competitive transportation-wise.

Q You know that the Sun Spot Mine of Ayrshire is at Vermont, isn't it?

A I know where it is.

Q Have you ever visited that mine?

A Yes, I have.

Q You also know, do you not, that the Ayrshire plant at Vermont loads coal onto the CB&Q?

A Right.

Q Which is taken down here to Frederick?

A Right.

Q Which is right north of Beardstown and then loaded on barges, right?

A Correct.

[129] Q And that dock is contiguous to the river, is it not?

A Right. That is correct.

Q Now, who owns that dock?

A I think Ayrshire owns the dock.

Q But isn't it a fact that the CB&Q does run along the dock there?

A Oh, yes.

Q For some miles?

A Oh, yes.

Q As a matter of fact, there is a grain loading facility just north of the Frederick dock there, isn't there?

A Right. That is correct. I don't know about the grain loading facility. All I know is that the CB&Q runs from the Sun Spot Mine to a dock on the river. I think it is near Frederick.

Q Right. Now, do you think that the United Electric could tie in the Industry Field with the CB&Q, and then go on the CB&Q to the river?

A Oh, I imagine physically it could be done, but the cost would be prohibitive.

Oh, you mean coming up the other way? Who would build the ten miles of railroad?

[130] Q From Industry to the CB&Q?

A Yes.

Q I don't know.

A My God, the CB&Q wouldn't build a railroad for anybody for ten miles for twelve million tons of reserves. You just couldn't afford to do it. Unless you sneak up on them.

Q How much would it cost to build the rail line from Industry to the CB&Q for ten miles, assuming it is ten miles?

MR. HEDLUND: If you know.

BY THE WITNESS:

A I don't know.

BY MR. CUSACK:

Q How much tonnage would you need to ship over this rail line to interest the CB&Q in putting a spur in to the Industry Field?

MR. HEDLUND: Can a ten mile piece of track be referred to as a spur? I just wonder. I am not an expert in railroads, but it seems to me that is a long spur.

• • • •

[135] Q Would there be a possibility of the coal at Industry Field being trucked to the junction or to the rail line of the CB&Q?

A I don't think it would be done economically.

Q How far do you truck coal at the Buckheart Mine to the processing plant?

A I wouldn't know. Back in 1966, I think our haul was something around four or five miles.

Q What is the furthest they have hauled coal at Buckheart to the processing plant?

A That I don't know.

Q Do you know how far they trucked coal from where the coal seam is located to the processing plant at Fidelity?

A I think that situation was similar to Buckheart, but I wouldn't know the exact figure.

Q Isn't it a fact that they do truck coal about six or seven miles down to Fidelity?

A Oh, I don't know.

• • • •

[142] I think at the time we originally looked at it, just from the figures that I saw at that time, they were well in excess of four dollars, and I said if that is what it is going to cost to produce the coal, I don't see what piece of business we are going to be able to put it on, and unless we can get an awfully low transportation cost, which didn't seem to be feasible with an isolated coal field sitting out there ten miles from the railroad and possibly 20 miles from the river.

All right, that is one way. First you get the production cost figures and what your costs are going to be when you are trying to determine the profitability of a coal mine. Now, that is the production department's duties. Our duties in the sales department, and sometimes this works in reverse: What could you get for this coal if we supplied you with a raw coal that would run, say, so many BTU's or a washed coal at so many BTU's? What could you return, what realization could you get for that coal for us?

• • • •

[170] Q Yes.

A So I mean, it is not an unusual practice. Now, the thing you are talking about is a whole number of suppliers to one station. That used to be common practice, well, maybe ten years ago, maybe as late as five years ago, but in any event in my experience in sales with United Electric that has been the trend: Big units, big volume, get the lowest transportation costs, get the lowest coal price, and get all your economies geared to volume movement, volume production, volume consump-

tion. I would assume that practice would certainly apply where you have two and a half million tons of coal involved per year.

Q In regard to the Industry Field, do you believe that the coal reserves at this field now owned by United Electric will never be used by United Electric for a mine?

A Boy, that is a hard question to answer. Let me put it this way. If during my regime as vice president of sales of United Electric, I could have come up with some sort of an idea for a sale, a combination of transportation and combinations where I could actually go somewhere [171] and sell that coal, I think I would have been the happiest fellow in the world. As pleased as I was that we were able to put together some of these other contracts that we did, you know how proud you are when you do a good job, you just kind of feel that, well, this is something that I worked hard on and it worked out pretty well. If there was one thing I could have done before I got out of the sales end of it at United Electric, if I could have put together something that I could have said, all right, let's go ahead and see if we can open up the Industry Field, I would have done it, but I was unable to do so.

Q Mr. Tarzy, in your opinion, is it possible that some day in the future the Industry Field will be opened?

A Somebody is going to have to figure out a way where somebody can make some money out of it. Does that answer your question?

MR. HEDLUND: Mr. Cusack, all things are possible, I suppose, in a sense. Mr. Tarzy has said that if you could figure out a way to sell the coal there at a profit, it will probably be mined. I believe that is [172[the thrust of his testimony.

* * * *

[179] Q Do you recall the interest of Iowa Illinois Gas and Electric Company in regard to the McDonough County coals?

A I remember the incident, and I believe that matter

was being handled by Mr. Ed Butler of our company when he was sales manager of our company.

Q Getting back to our discussion this morning in regard to the principal customers of United Electric, Mr. Tarzy, did you ever call on the M. F. Hughes Coal and Oil Company?

A No, I never called on them, but I did talk with Mr. Hughes on the phone on a number of occasions.

Q And did the Hughes Coal and Oil Company purchase coal from United Electric?

A I believe they did. Now, I have a recollection on that, I think Hughes was a customer of either Freeman or Material Service. He was a retail coal dealer and it was a very small account, I mean it is a retail dealer account, and I normally didn't get into such. I had contact with it and I was supposed to know what was going on, but it was such a small part of [180] our business that I didn't pay any specific attention to it.

Q Do you know which mine of United Electric supplied Hughes?

A Let me see. I think most of the business that we did with Hughes, and this is strictly from memory, I think was with the Board of Education. I think it was bid business mostly, where we would ship from the mine, as I recall it, to the retail yard, and then he would deliver it. I think later didn't he establish a barge dock and then deliver his coal off of the barge dock, or something like that? I don't remember. It wasn't a significant piece of business.

Q But would United Electric Fulton County mines have supplied the Hughes Company?

A I would say, being a retail coal dealer, probably Fulton County coal was too poor a quality of coal for him to handle. As a general rule, and the company records would show that, but usually a retail coal dealer would want to buy a higher quality of coal, like maybe Banner, and then another step further down to our Fidelity Coal. But normally Fulton County coal as such [181] was strictly a utility industrial coal.

Q Mr. Tarzy, did you call on the Caterpillar Tractor Company?

A Yes.

Q Who did you call on there?

A Let's see. He wasn't the purchasing agent. He was director of purchases. Is his name important? I think it might come to me.

Q Well, if you think of it, let us know.

A Yes, I will let you know. It will come to me, but it is an unusual name, and I did play golf with him one time, so I do remember his name. I think he won a quarter from me or something.

Q What plants of Caterpillar did United Electric supply?

A We supplied their Aurora plant, I believe it was, and also their plants I believe in East Peoria.

Q And from what mines, sir?

A The Cuba Mine.

Q Was this Aurora plant the same as Montgomery?

A Yes, I am sorry. Montgomery was the [182] shipping point and Aurora was the town that the plant was located in or near.

Q And the coal came out of the Cuba Mine?

A That is right.

Q Did you ever call on Keystone Steel & Wire Company?

A I have visited with them on occasion, but that particular account was handled out of our Peoria office.

Q And that was for the Keystone Wire plant in Peoria?

A Correct.

Q And that coal came from what mine?

A The Cuba Mine.

Q Did you ever call on Lehigh Portland Cement Company?

A Yes.

Q Where is that headquartered?

A Their headquarters are in Allentown, Pennsylvania.

Q Did you call on Lehigh—who did you call on at Lehigh?

A Mr. Jones.

[183] Q Did United Electric supply coal to Lehigh?

A Yes.

Q For what plants, sir?

A We supplied coal initially for their, either Oglesby or LaSalle, Oglesby and LaSalle are kind of sister cities. I don't know whether they call it the Oglesby plant or the LaSalle plant.

Q That is in Illinois, isn't it?

A That is right. Up to a time when they shut the plant down because it became uneconomical to operate it, and then from that point on we attempted to sell them, I believe, our Fidelity coal for their Mason City plant.

Q It is a fact, is it not, that United Electric did sell coal to the Mason City, Iowa plant of Lehigh from the Fidelity Mine?

A I believe we started out by shipping them Fidelity coal, at least that is what we were attempting to do, but the Fidelity coal, I believe, didn't turn out to be of good enough quality to be able to carry their requirements and their load.

[184] Q Was United Electric then canceled?

A No. I believe, scratching my memory again, I believe, rather than losing the business—nobody likes to lose business—since they wanted a higher quality of coal and were willing to pay, I think, a little premium for it, I think we were successful in obtaining some coal from Freeman to put on that order. I am a little bit hazy on that. The records would show it.

Q Was the Mason City plant of Lehigh capable of being supplied by the Banner mine?

A No. Oh, no. It was strictly a rail plant, and Banner, of course, is strictly a barge.

Q Do you know whether or not United Electric sold any coal to Peabody?

MR. HEDLUND: Ever?

BY MR. CUSACK:

Q Between 1960 and 1966.

A Yes, we did.

Q Where was that shipped to?

A Well, let me see. Of course, Crerar & Clinch, you

know, is the retail outlet for Peabody [185] Coal Company.

Q Yes, sir.

A So we did ship them some coal. I think we actually may have got the purchase orders from Peabody and shipped the coal to Crerar & Clinch. I believe on some occasions when they ran short of coal, I believe in Fulton County, and we had the coal available, we would sell them some of our Fulton County coal. The records would show that. Do you know these things or are you—

Q No, sir.

A You don't? I was just wondering how I was scoring.

MR. HEDLUND: You mean with respect to your recollection?

THE WITNESS: Yes. I mean, you are asking me some things that go back pretty far, you know.

MR. CUSACK: No, we are not testing your recollection. What we are trying to do is obtain facts.

THE WITNESS: O. K. I will give them to you as I understand them, but they may not be exactly pinpointed.

[186] MR. CUSACK: I understand. We are trying to determine the facts of the case.

I am reading from a schedule, but it is not of evidence.

THE WITNESS: All right.

BY MR. CUSACK:

Q Did United Electric sell coal to Inland Steel Company?

A Yes.

Q Who handled this account at United Electric?

A I believe I started out handling that one, and then I believe Ed Butler and Jess Gildhaus and Dick Hampson, I think, followed through on it.

Q Who did you people deal with at Inland?

A I believe Mr. Don Haupt, who was the original contact we had, and he was promoted, and the name I recall is a Mr. Bowman who took his place, but I think about that time I got out of the picture.

Q For what plant of Inland Steel was this coal?

A Indiana Harbor plant.

Q East Chicago, Indiana?

[187] A Yes.

Q Was this steam coal?

A Yes.

Q Is it a fact that Freeman also supplied coal to the East Chicago, Indiana plant of Inland Steel?

A I think they did. Well, most steel companies, I think, require metallurgical coal, and I think they would be a likely prospect for metallurgical coal, and Freeman had metallurgical coal which we didn't, so I mean, a natural assumption is that maybe they did.

Q Do you know whether Freeman supplied any steam coal to Inland Steel?

A No, I am not sure.

Q Is it a fact that United Electric sold coal to Central Illinois Electric and Gas Company in Rockford?

A Yes, we did.

Q For what plants was that?

A That was for the Saybrook and Fordham plants.

Q Where was this coal shipped?

A It was shipped from the Fidelity Mine— [188] let's see, this was in 1966—yes. About the time I was getting ready to leave, I think they were having some difficulty in being able to use the Fidelity type coal, a similar instance to the Lehigh thing, that we tried to retain the business by maybe getting some higher quality coal from Freeman. I don't know whether that was effected or not, but I think that was going on about the time I left.

Q Is it your recollection that Freeman in effect backstopped United Electric on this contract with Central Illinois Electric and Gas?

A Backstopped? What do you mean?

Q Well, did it take up the contract?

A Well, let's see, yes, I believe we had a contract then, and if we were, of course, unable to fulfill our contract, we would make every effort to do so, and if we could get Freeman to help us out, very much similar to that TVA thing I was talking about, vice versa, yes, we would do it.

Q The generating plants of the Central Illinois Gas and Electric Company are located in the northern part of the state?

* * * *

[196] First of all, you have to find somebody who uses coal. Am I getting down to it?

Q Fine.

A Back in the old days we used to chase smokestacks, you know, down railroad tracks, and this is the way you try to find an ultimate user of coal. But it has gotten a little bit more scientific today. Through your experience, salesmen's experience in the coal business, you pretty well know who the established users of coal are. Then in our case, in the case of United Electric, if we were a producer of coal, and let's take specifically a coal mine—I think I can simplify this thing because I don't think we want to take too long on this, and maybe I can illustrate the point. Let's take the Banner Mine. We are going to put the Banner Mine in, and we have established no sales for it, so the Banner Mine is a barge loading mine, so the first thing that a salesman would look for would be people that use barge coal. That would be a natural assumption. Say you would go up to the power plants up and down the [197] Illinois River, mostly up because that is where the market is, the natural market for the coal, and you would call on the purchasing agent or the fuel buyer, tell him about your product, try to sell him on the virtues of your coal versus the coal that he was using, and naturally the buyer was interested in making the best purchase he could.

Once you established the fact that he could use your coal and your coal could fit into the equipment that he had, and so forth, then you would get down to the matter of economics. If he felt that the use of the coal that I or any other coal salesman might offer to him would be of better use to his company or corporation, he would possibly, to confirm the results that the coal salesman had predicted for the coal, would probably run a test on the coal. That way he would be able to determine the quality of the coal, its application to the particular equipment that it was going to be burned on, and all

those sorts of things. If the test worked out pretty well, it would eventually wind up into a negotiated contract, and you would have sold [198] some coal.

* * * *

[214] A I never studied it that close, sir.

Q Have you ever heard anyone say it was inaccurate?

A I would have to go back—here I am scratching my memory again. I think I did find a few discrepancies in it, but I wouldn't know. I mean, you would have to go over it with a fine-tooth comb and say maybe this mine wasn't on all of those railroads, or maybe that one railroad didn't belong to that mine, or something like that. It would be one of those things.

Q All right. Now, back to my original question, and having reference to Tarzy Deposition Exhibit 1, could you tell us, sir, with what companies United Electric was in competition?

I point out to you that this map does purport to show the companies and the mines located in the Eastern Interior Coal Mining Districts 9, 10 and 11.

Incidentally, what do they call this coal field, the coal field that encompasses Illinois, Indiana and West Kentucky?

A We usually refer to it as the Midwest Coal Fields.

[215] Q Have you ever heard it referred to as the Eastern Interior Coal Province?

A Maybe I might have, but then I would have to say do you really mean the Midwest Coal Field? That is what I would have to say.

Q Right. That is what we mean.

Now, could you tell us, Mr. Tarzy, again with what companies United Electric was in competition with in 1966?

A In 1966, or do you want to refer to the date of this map?

Q All right. Let's do it in 1963 then.

A Let me see if I can scratch this out. Now, Fulton County, we would compete with other Fulton County operators that had similar coals, so the first thing to do would be to go to Fulton County. All right, here is the Sun Spot Mine—is that the actual name, Thunderbird Collieries Corporation?

Q Yes, that is the operator, Ayrshire.

A Ayrshire Coal Company.

This mine is out of business.

Q You mean the Flamingo?

A The Flamingo Mine is out of business. [216] When they ran out of reserves there, they went over and opened up the Sun Spot Mine.

Q That is interesting. Do you mean when the Thunderbird Collieries ran out of reserves in Fulton County, they opened the Sun Spot Mine?

A That is correct.

Q Which is the same seam as the Industry Field?

A Yes.

Q Who else, sir, would United Electric be in competition with in 1963?

A Fulton County, Little Sister—no, I guess that is now controlled by Truax-Traer Coal Company. Here, Truax-Traer Coal Company, their Red Ember Mine. And Peabody Coal Company, the Edwards Mine.

Q That is in Peoria County?

A Right. The Key Mine is out of business.

Q The Key Mine of Peabody, which was located in Astoria?

A Peabody Coal Company, I believe they have combined these mines, but I think they call it the Middle Grove Mine.

This mine is a small truck mine, and [217] it never has been—that is the Laura Mine of Pioneer.

* * * *

[222] Q Let's go back to the Fidelity Mine and find out who the competitors are or were, at least, in 1963 when the map was published, and [223] in 1966 when you left United Electric, who the competitors of Fidelity Mine were, wherever located, even in Pennsylvania.

A Well, we considered our competition to be the people that were in the same freight rate district that had the same type of coal, that could handle the coal the same way we did. That was our competition.

Q What about producers operating in the Southern Illinois freight rate district?

A We didn't consider them prime competition. The river business was the big business for Belleville, and

the Belleville producers, because of their transportation advantage to the river, were the ones that were competing. I would say Southern Illinois, unless it was distress coal, wouldn't compete, or coal of say similar nature like dust or carbon, stuff like that. You are familiar with what I mean by that.

Q No. Would you explain it, please?

A Well, dust and carbon are kind of byproducts of coal, that are kind of left over when you are making a premium product. For [224] instance, if you were going to make metallurgical coal and you wanted to make it as high quality as you can and with the least sulphur you can, you would probably take out some of the fines in the coal that contain the most impurities and the most sulphur, and that would be kind of a byproduct of the coal.

Q I see. Now specifically, did Fidelity Mine of United Electric at DuQuoin compete with any of the General Dynamics, the Freeman or Orient Mines, which are in the Southern Illinois freight rate district?

A Are you going to talk specifics now, like Northern States Power?

Q Well, did they?

A Not particularly at Northern States Power.

Q Do you know whether Freeman shipped any coal to Northern States Power?

A No, I don't. If it did, it was strictly just kind of one of those emergency things, or something like that.

Q What about Union Electric?

A Union Electric, I believe they did ship [225] coal to Union Electric, but there again the time I was there, I think it was this byproduct thing I was talking to you about.

Q They shipped byproduct coal?

A Now, wait a minute. The byproduct I mean is the dust and the carbon that was kind of left over.

Q Would Freeman be shipping this?

A Yes, they would be shipping it.

Q To Union?

A To Union Electric.

Q What would United Electric be shipping?

A Well, we have a long term, in 1966, and I pre-

sume it is still in effect, a long term contract with Union Electric on our Belleville screenings, that is, you know, our regular product to ship to the Merrimac plant of Union Electric, and that went rail-barge.

Q Do you know whether Freeman shipped into the Merrimac plant?

A Well, as I remember, there were three basic contracts to take care of the Merrimac plant, and that was United Electric, Truax-Traer, and Peabody Coal Company. They were basic long [226] term contracts, and if Freeman did ship in there, it would probably be this dust or carbon thing which would be kind of a, well, what would you call it? Supplementary or spot business or something like that.

Q Do you know of any other customer which was supplied from 1960 to 1966 from both the Fidelity Mine and any of the Freeman Mines, either the Crown, Orient No. 3, Orient No. 4 or Orient No. 5?

MR. HEDLUND: Other than the ones he has mentioned?

MR. CUSACK: Other than the ones he has mentioned. Thank you.

THE WITNESS: May I have that again?

Q (Read by the reporter.)

BY THE WITNESS:

A Regardless of how small it was? You want something that amounts to something, don't you?

BY MR. CUSACK:

Q Tell us any, and then qualify it by how much, if you know.

A Keokuk Electric Metals, for instance, [227] Keokuk, Iowa, I think, took some coal from both us and Freeman.

Q Do you want to try to say how much or qualify it?

A I think their total burn was about 80,000 tons. It was kind of a small piece of business.

Q Did United Electric and Freeman split this business?

MR. HEDLUND: I am going to object to that question as worded. I don't understand it.

BY MR. CUSACK:

Q Did United Electric and Freeman supply together all of the requirements of Keokuk?

A No, we didn't supply it together. We shipped it separately.

Q Separately, but did you supply all the requirements?

A They got an order there, and they tried hard to get an order, and we tried just as hard to get an order for ourselves.

Q You were in competition, in other words, on this business?

[228] A I would say so, yes.

Q When did you get this business? When did you negotiate this contract?

A I don't know whether we still have the business or not, but we have shipped Keokuk Electric Metals as long as I was vice president of sales.

Q Did Freeman also ship to Keokuk Electric Metals from 1960 to 1966?

A That I don't know. I do recall at some time during the middle '60's that we learned about this. But when you talk about competition on this sort of thing—

Q What do you mean we learned about this? Learned about what?

A You are saying when were you competing with them. Actually, this thing of competition is such that you are trying to sell equal products, you know, and trying to do your best to make the best deal.

Q We don't object to that.

A I know that, but in these cases that I mentioned with Union Electric and with this Keokuk Electric, basically we weren't competing [229] with them because they had a different type of coal out of a different freight rate district. But these things that I am mentioning now, in the case of Union Electric, they shipped their so-called byproduct, dust and stuff, that it was kind of hard to get rid of, and we in the normal conduct of business couldn't compete with anybody in Southern Illinois, Freeman or Old Ben or Bell and Zoller that had any of this dust to sell because it wasn't an equal competitive product. If they wanted the business, wanted

it bad enough, nobody could compete with them. You see my point?

Q Yes, but Freeman didn't sell dust to Keokuk, did they?

A Yes, it was dust and carbon. Oh, yes.

Q And you sold screenings?

A Yes, that is all we had to sell.

Q There was no way that you could get dust out of your mines, out of the Fidelity mines?

A Well, there are different types of coal. Southern Illinois coal is of such quality that they tried to upgrade it into metallurgical [230] type coal and stuff like that to get the highest possible realization, and so in making this so-called byproduct of dust, they came up with a product that, well, nobody can compete with.

Q All right. Now, other than Keokuk, other than Union Electric, what other customers were supplied by Fidelity Mines of United Electric and any other mines of Freeman?

MR. HEDLUND: He has also mentioned TVA.

MR. CUSACK: Right. That was this morning. Thank you.

BY THE WITNESS:

A This comes to mind, I think Dairyland Power Cooperative, the same situation, dust and carbon versus our Fidelity screenings.

BY MR. CUSACK:

Q How would Dairyland Power handle this? Would they mix the screenings with the dust and the carbon?

A Yes, it was a very difficult product to handle. I mean, it would blow and they would complain about it. You would put it in a car, and if you get a heavy wind, it would all blow [231] away, and they wouldn't get the weight they wanted for the coal. It was kind of a messy sort of thing.

* * * *

[232] MR. HEDLUND: I don't understand it even with the question properly punctuated.

THE WITNESS: I think I know what he means.

BY MR. CUSACK:

Q Let's run it through again. What advantage, if any, did the dust and screenings of the Crown Mines, of the Orient Mines, I should say—

A Not dust and screenings.

Q Excuse me. Dust and carbon of the Orient Mines over the screenings of the Fidelity, if any?

A What advantage? The price.

Q Is it more or less a dump product?

A I have described it that way.

Q O. K. Now, how much would Freeman sell this for per ton, do you know?

A I don't know. We just recognized the fact that if dust and carbon were available, it was just kind of tough to compete with, period.

Q Are you familiar with the troubles that Union Electric has been having with regard to air pollution?

[233] A Not recently, no. I think there has been a lot of stuff in the press, as I get out there in Phoenix, that almost any utility is having trouble with air pollution problems.

Q Do you read the NCA News?

A Yes, I do.

Q Are you aware of the article in the NCA News where the City of St. Louis was almost going to close down the generating plant of Union Electric because of high pollution?

A The way I read the articles, I don't think it got quite that serious, but it might have sounded that way.

Q All right. Now, is there a greater sulfur emission from carbon and dust than there is from screenings?

A It is one of these things again, and may I kind of interpret that for you? In the boilers at Merrimac, all of the coal they get there is crushed down to a powder before it is burned anyway, so the initial size doesn't make any difference in the combustion process.

Q All right. Then my question goes to the carbon—

[234] A The same thing.

Q It doesn't make any difference then?

A No. It is all ground down to the consistency of face powder before it is blown into the boiler and burned.

Q So, in other words, the screenings end up to be like the dust and carbon anyway?

A At the burner.

Q At the burner. So by the time it gets into the burner, it is the same stuff, isn't it?

A Size-wise, yes.

Q Is there any difference in it other than size? I mean, the size is the same. Is there any other difference?

A Well, you say the same. It might be the same consistency of fineness, but you have the matter of quality to go into.

Q Is the Southern Illinois dust and carbon of a higher quality than the screenings of Belleville after it is pulverized?

A That is a tough one to answer. The washed Belleville screenings, let's just take the BTU, would run 11,200 to maybe 11,400, [235] somewhere in there, whereas the dust, depending on just how they want to upgrade the product, could be anything maybe from 10,000 maybe to 11,000 or maybe 11,500, depending upon what fraction of the coal that they have upgraded.

Q Keokuk Electric Metals, did they also pulverize your screenings?

A Yes.

Q And it was put into the boiler with the dust and carbon?

A Well, they would use them separately or interchangeably.

Q Or mix them?

A I mean it all depends. You see, they took the coal by barge up there, so it was just a matter of how the coal would arrive.

Q What about Dairyland Power, what would they do with the screenings?

A They pulverized it, too.

Q Did all the electrical generating stations pulverize coal?

A Oh, no, they don't. You want me to elaborate on that?

Q Sure.

* * * *

[238] Q All right. Now, when you walk in the door to the purchasing agent of Commonwealth [239] Edison

Company to try to sell them some coal, who are your competitors there?

A Commonwealth Edison?

Q Right.

A You are talking about what kind of coal?

Q Any kind of coal. Who do you look upon as your competitors when you walk in the door of Commonwealth Edison Company and try to sell some coal?

A Well, you have to look at your Fulton County fellows that can ship by water. That would be Truax-Traer and Ayrshire and Peabody.

Q Who else?

A I can't recall any others from Fulton County.

Q What about the Crown Mine?

A Well, I think the Crown Mine, they are from Central Illinois, and they would compete with Mine No. 10, I think. Competition between Fulton County and Crown, Fulton County just has the advantage of their being closer to the river and their transportation.

* * * *

[244] BY MR. CUSACK:

Q Can the Fulton County mines supply all of the coal requirements of Commonwealth Edison Company?

A I don't think so.

Q So Commonwealth Edison Company has to buy coal elsewhere, do they not?

A Yes, and I think they do.

Q They buy coal from the Southwestern Illinois Coal Corporation do they not?

A Right.

Q For their Joliet station?

A That is right.

Q And they buy coal from Freeman, do they not?

A I believe that is right.

Q And they buy coal from any other people?

A Peabody Coal Company?

Q The Mine No. 10 at Pawnee?

A Right.

Q But you do not consider United Electric to be in competition, as you know the term, with Freeman because it has a greater competitive advantage, is that correct? Because it has a [245] price advantage?

A Can I answer that my way?

Q Sure.

A Going back to the same illustration that I made on the dust, any time Southern Illinois wants any business and they have got dust to sell, dust is a byproduct and they have the advantage of a byproduct price, and Belleville cannot compete. The reverse situation is true as far as the river coal is concerned. If Fulton County wanted the business and takes full advantage of their more advantageous transportation costs, they can have all the business they want.

Q Now, wait a minute. You testified they can't supply all the coal requirements of Commonwealth Edison.

A I say all they want. I am talking about the shipper, us, for instance.

Q But they do sell all they want,, don't they? Doesn't United Electric sell all the coal it can produce?

A Well, when I was with the company in 1966, we had all we could production-wise to [246] take care of our orders.

In other words, we had all we could possibly want and ship and produce.

* * * *

[265] Q I believe it says, "However . . ."

A However, after what?

MR. HEDLUND: Discussing.

BY THE WITNESS:

A (Continuing)—discussing this further, we thought it may be—

BY MR. CUSACK:

Q This matter further.

A (Continuing)—delay making a bid, so I would say we didn't make a bid, from what it says in this letter.

Q Well, based on this document,, do you have a recollection that in February of 1961 United Electric was considering making a bid for contract for coal to be let by TVA?

A Let's see. Now, you say United Electric. This was an underground proposition. To go back just a little

bit, you know, we were the sale agents, United Electric was the sales agent for the strip coal from the Ruby Mine and we were approaching the time when those strip coals were going to be exhausted, and so forth, and so in conjunction with the Ruby Mine, they did also have the lease on the coal that [266] underlay the No. 11 and No. 12 seams, which is a No. 9 seam as you see here; right?

Q Yes.

A So this would have to be the Ruby underground mine, and in this case, not knowing anything about mining underground coal, we normally discuss these matters with our so-called free underground consultants, the Freeman Coal Mining Company, and that is what it meant. We discussed it with them to see whether they may be interested in mining this coal if we could, if we or they, I don't think it was decided at the time who would make the bid, whether we would make it or Freeman, but I would assume since it was going to be underground coal and we knew nothing about mining underground coal, that it would be a Freeman bid and that we were just calling it to their attention since we did have this relationship with the Ruby Mine.

Q Calling this to the attention of whom?

A To Freeman Coal Mining. You see, it says I talked to Mr. Nugent. He is Freeman Coal Mining, and Edwin Ruby is the one that had [267] control of the property.

Q Is it your testimony that in 1961 you talked to Mr. Nugent and asked him about the development of an underground mine at the Ruby Mine, the Ruby property?

MR. HEDLUND: I think that is what he just said.

BY THE WITNESS:

A Yes, I think that is what it meant, yes.

BY MR. CUSACK:

Q And you recall doing this?

A Yes. It is written right here.

Q Then it is contemplated that United Electric would not mine this property but that this Ruby Mine would be mined by Freeman?

A I had to go on the assumption because United

Electric couldn't mine anything underground. They weren't equipped to do it.

Q You know, do you not, that United Electric had an underground mine at Buffalo Creek?

A I don't know whether that was prior to my time or after my time, but I have heard [268] about it, and I understand it was not very successful.

Q But you know they did have an underground mine there?

A It is not an underground mine as such. In fact, I was down at the mine, I believe I was there with the—maybe that was my first inspection trip of the mines. They had reached a point in the mine where the high wall was so deep that they couldn't continue to strip it, so they thought they would kind of punch a hole in there with a mining machine and take a shot to see what they could do with underground mining that coal, and my recollection at the time when it was all over that it just didn't pay out. I just had very little to do with it.

Q Buffalo Creek coal was stoker coal, wasn't it?

A It was a domestic coal, and I think at the time there was a fairly good demand for the coal. There was still enough demand in the domestic market where the sales department was asking for more coal and the only way to get it was to try to supplement the stripping some [269] way.

* * * *

[270] BY MR. CUSACK:

Q Who do you mean by we?

MR. KEMPF: Here we go.

BY THE WITNESS:

A Here we go, is right. Let's see. We—you notice I refer to a Davis Reed report in the P. S.

BY MR. CUSACK:

Q Yes.

A That was a report that was sent to us by Edwin Ruby. That was a feasability and cost study in developing this property that was made by, I believe, Davis Reed was an engineer in West Kentucky, and he made that report for Edwin Ruby, and Edwin Ruby sent it to us, and of course we in turn would have to discuss it with

somebody that knew something about underground mines, so naturally we would take it to Freeman because we used to get free advice on underground mining from Freeman.

I imagine the "we" was maybe a [271] combination of Edwin Ruby and myself, and maybe Frank Nugent. I think that would be the logical way.

I mean, since 1961, I think that would kind of make sense if you would interpret it that way. But really, by we, I mean it had to be discussed further to find out just where we were going and be sure of what the costs were and what the situation was before you could make a bid on anything. So apparently the information at hand was incomplete, and we asked to do some more, get some more figures. Maybe, I would say possibly, if I had to reconstruct this thing, I would say that any good coal company, whether it is strip or underground, would not take the word of somebody else. They would go in and investigate a proposition with their own men and find out, you know, try to confirm some of the figures that were given to them. So I would think that this thing would have wound up, and this is maybe not the way it happened, but reconstructing it because I think this happened maybe several times when underground propositions came up, that Mr. Nugent possibly [272] wanted to send this report to one of his engineers or maybe send him down to the mine to look it over and look the conditions over, and that sort of thing.

Q Mr. Tarzy, United Electric did take an option on the Edwin Ruby property, didn't they?

A I think we talked about it at one time. I think Mr. Morris is the one that handled that. Do you want me to say yes or no? I can't say yes or no. I really don't know.

Q Mr. Tarzy, I ask you to examine what has been marked as Tarzy Deposition Exhibit 4, which is a letter from B. R. Gebhart to Mr. Morris, dated August 22, 1966. Does this refresh your recollection in regard to United Electric taking an option on the Ruby property?

A It says here that it appears we are now clear to let the option—I don't know whether that means that United Electric or Mr. Morris had it, or Freeman. • • •

• • • •

[288] Mr. Tarzy, does this first sentence refer to a contract between United Electric and TVA for United Electric to supply some coal to TVA?

A Yes, I believe it was. You are going pretty far back here.

Q Do you recall when that contract was entered into?

A Well, he refers to a "new TVA contract," so it must have been somewhere around that time.

Q And do you know how long that contract lasted?

A No, I don't, without checking the records.

If I may volunteer this, this was approaching, I believe, the tail end of our Ruby mine. I believe, if you will check the records, it almost has to be that. I can't recall of any other instance where it would happen.

The Ruby mine was petering out; it was running out of reserves, and we wanted to be able to sell the reserves up to, you know, the last week the mine operated, and so forth, so in order to be able to assure ourselves that we were going to be [289] able to ship any coal on any contractual commitment we made, we wanted to be sure we had some backup tonnage, and this sounds like one of those deals, where we wanted to be assured that we had some tonnage to back up any contract that we made with TVA.

* * * *

[301] Q Mr. Tarzy, I would like now to ask you a few questions in regard to generally where coal produced in Illinois is shipped.

Very generally, in reference to a map of the United States, which we will not mark as an exhibit. I don't really think it is necessary.

MR. CUSACK: Is that agreeable with counsel?

MR. HEDLUND: Yes.

BY MR. CUSACK:

Q Could you tell us, please, generally where the coal produced in the State of Illinois is shipped?

A I could probably do a little better job if you would ask me about the coals that I was familiar with, the Fulton County and the Belleville coals, because those are the ones that I followed in my sales career. Would that suffice?

Q Well, do you know generally where all the coal produced in Illinois generally went?

A No.

Q All right. Would you tell us then where the Fulton County coal went?

A Well, the Fulton County coal—I think [302] we discussed this a little bit yesterday. In our case, we had the Buckheart mine and the Banner mines located in Fulton County, and they were primarily mines which shipped barge coal, and they served plants up the Illinois River, as we discussed yesterday, the river plants of Commonwealth Edison, I think there is a cement plant, I believe, up there, but that was the general.

If you want to take, say, our loading docks in the Fulton County field, around Liverpool and Banner and generally up to Chicago, that would be our market for Fulton County river coal.

Q I see. Where else would it go?

A Well, that is the river. I think the farthest south we shipped the coal was the Mederosia plant.

Q And that is south of Banner?

A Yes. That was about the dividing line. Once you started to get down in this area (indicating), then we would be competing against ourselves with our Belleville coal, that went by river, you see.

Q You also had some Fulton County coal, did you not, of United Electric, that went into Wisconsin?

A If it was, it was strictly one of these [303] test deals.

* * * *

[304] Q Where did this coal come from, that was [305] sent to this utility?

A Well, we wound up with a term contract with them to ship our Fidelity coal, via barge, up the Mississippi River to their Nelson Dewey plant at Cassville.

Q I see. I understand.

All right. Now, can we go into the areas where the Fidelity coal was shipped?

A Yes. Fidelity coal, our principal markets would be our river coal shipped to the river, either to the Ford dock originally, and I believe, when I was leaving there, it was going through the Kellogg dock, or it could go

through the East St. Louis dock, but anyway, it would wind up in a barge, and then it would be shipped northward to the various utility plants on the Mississippi River, via barge.

Q As far north as Minneapolis?

A Northern States Power at Minneapolis, correct.

Q And you also had coal from the Fidelity mine going to the Tennessee Valley plants in West Kentucky, did you not?

A Well, I think, as I have said a number of times before, we never did consider Fidelity coal [306] as being competitive on TVA business.

Q I ask you to answer the question, Mr. Tarzy.

A What is it?

MR. HEDLUND: He has answered it before, many times, Mr. Cusack.

BY MR. CUSACK:

Q The question is, that you had TVA coal going into the Tennessee Valley Authority plants in West Kentucky, is that correct, sir?

A Yes.

Q Did you have any Fidelity coal going to the TVA plants in the western part of Tennessee?

A No.

Q Did you have any Fidelity coal going into the St. Louis metropolitan market?

MR. HEDLUND: If the witness understands what you mean by the "St. Louis metropolitan market."

THE WITNESS: Yes. I can answer that question.

BY THE WITNESS:

A That was a natural market for our Fidelity coal. Yes.

[307] BY MR. CUSACK:

Q Do you know whether or not, except for metallurgical customers, any Eastern coal comes into the Midwest market?

A You mean into the Midwest territory—

Q Yes.

A —because "market" is what we kind of use as a potential sales market place, so to speak.

Q Yes, sir.

A Yes. I understood, and I think did know at one time, that quite a bit of what you might call Eastern coal did come into the, well, the steel mill region of the Chicago area.

Q That is metallurgical coal.

A That is what you asked, wasn't it?

Q I said, other than metallurgical coal.

A Oh. Other than metallurgical coal.

I didn't know of any substantial movements of coal.

Q Is it a fair statement to say, Mr. Tarzy, that the requirements for coal in the State of Illinois, with the exception of some metallurgical coal, are largely satisfied by coal produced in Illinois and in Indiana and in West Kentucky?

[308] A This is a very general question, isn't it?

Q Yes, sir.

A Oh, yes. That would be the natural market, I would say, for part of the coals that you are talking about.

Q Can you tell us what other areas or what other states or parts of states coal produced in Indiana, Illinois and West Kentucky is sent to or sold?

MR. HEDLUND: If you know, other than you have already testified to, and other than what you have testified to with respect to the shipments made by United Electric plants.

THE WITNESS: You are trying to find out just what states got some coal from this so-called Midwest coal region, is that right?

MR. CUSACK: Yes, sir.

THE WITNESS: Well, let me see that map again.

MR. CUSACK: Yes, sir.

I am showing Mr. Tarzy a road map of the United States.

[309] BY THE WITNESS:

A We mentioned Illinois.

BY MR. CUSACK:

Q Yes, sir.

A Wisconsin, Minnesota.

These are very general, of course. I mean, Minneapolis might be maybe the only spot where we could ship the coal.

Minnesota, Iowa, Missouri. Do you want to include West Kentucky, to my knowledge?

Q Yes.

A It wouldn't be recent knowledge, because you know I haven't been associated with West Kentucky since our Ruby mine mined out their reserves, but if you want me to take a guess at that, I will.

Q Yes, sir. Please.

A I think they would have probably shipped some coal into Arkansas, Mississippi, Tennessee, Kentucky and Indiana.

Q Now, Mr. Tarzy, do you know whether—

MR. HEDLUND: Have you finished your answer, Mr. Tarzy?

THE WITNESS: No, I am not finished.

[310] BY THE WITNESS:

A (Continuing) Now, that is generally speaking. Now, if you want what we considered in the trade unique movements that were inspired by unusual transportation arrangements. Do you know what I mean?

For instance, I would say that some West Kentucky coal, I understand, goes to Tampa, Florida, which is kind of an unusual, very specialized situation.

Is that what you had reference to?

BY MR. CUSACK:

Q No. I understand that is unique, isn't it?

A Yes. And of course you remember I told you yesterday that in a curious quirk of transportation, before the rail rates were reduced, we even shipped some of our Fulton County coal all the way around to Detroit, you recall.

Q That was very unusual, though, wasn't it?

A That is right. But you weren't asking me to refer to anything like that?

Q No.

A Well, I would say that that would be about it, generally. But you would have to get into speci- [311] fic plants to be able to pinpoint this thing. In other words,

I don't think you could say that our Fidelity coal, for instance, could serve all the points in the State of Minnesota.

Q I see.

Mr. Tarzy, do you know whether or not any coal produced in West Kentucky, Indiana and Illinois, which are Mining Districts 9, 10 and 11—

A Yes.

Q —do you know whether any of that coal is sold in Eastern Kentucky?

A Well, I know some of it goes to Louisville.

Q Is that considered Eastern Kentucky?

A Well, on this map it is about half way between east and west.

Q Do you know whether any coal produced in Illinois, Indiana and West Kentucky goes any further east in Kentucky than Louisville?

A I think at the time that I had anything to do with West Kentucky coal, I believe we kind of figured, the cost of the freight rates, that Louisville was about as far east that we could go at that time.

Q All right. Now, Mr. Tarzy, do you know whether or not any coal mined in Indiana, Illinois [312] and West Kentucky, that is, Mining Districts 9, 10 and 11, is sold in Ohio?

A Yes. That is another one of those unusual transportation things.

I believe, at the time we were interested in West Kentucky coal markets, it was coal that was coming out of the Green River that went to some of the power plants of the Cincinnati Gas and Electric Company.

Q Do you know whether that continued for any length of time?

A No. It wasn't part of our market pattern, and I couldn't answer that.

Q As a general rule, Mr. Tarzy, do you know whether or not coal produced in Illinois, Indiana and West Kentucky moves in any significant quantities into Ohio?

A It is not a natural market, as we considered it, when we were handling West Kentucky coal.

Q Now, in connection with the State of Iowa, do you know whether or not any substantial amounts of coal

produced in Illinois, Indiana and West Kentucky moves into the western portions of Iowa?

[313] A I wouldn't think so. It wouldn't look like a natural market. No.

Q And, Mr. Tarzy, in regard to the State of Missouri, do you know whether any coal produced in Illinois, Indiana and West Kentucky moves, in any significant quantities, into the western portions of the State of Missouri?

A Well, there again I think it is a similar situation, as the thing that applies to the western part of Iowa.

Q Your answer is that it does not?

A Yes. It wouldn't.

Q In regard to the State of Minnesota—

A Where is Sibley?

Q Sibley, Missouri?

A Yes. I think there was a power plant there, that we worked on at one time, that was getting some coal out of the Belleville field. We were unsuccessful in getting some of the business, but—

Q Was that a Union Electric plant?

A No. It was a Co-operative Electric plant. You would probably have to get a map of Missouri.

The reason why I remember it, following [314] your line of questioning here on this thing, at the time it was announced that there was some Belleville coal going out to Sibley, it was another one of those, what you might call an unusual movement.

Q Because Sibley was—

A It was, as I remember it, and if you will check the map, it is probably approaching the western portion of Missouri. You would have to check the map to find that out.

Q Mr. Tarzy, in regard to the State of Tennessee, do you know whether or not any coal, mined in Illinois, Indiana and West Kentucky, moves in any substantial or significant quantities into the eastern portion of Tennessee?

A We had better try to define what the eastern portion is, and I am still not too familiar with this thing. If you want more accurate or definite information, I think it would be well to go to somebody who has more familiarity with it. But if you want my recol-

lection from when we handled West Kentucky coal, we used to put some coal into Nashville from West Kentucky, and into Shelbyville and Murfreesboro, and I think in the latter stages of the Ruby mine, the L & N put in a rate that [315] would allow L & N shippers to ship to a TVA plant down at Widows Creek, which was on the Tennessee River, about in the middle of the state here somewhere, just south of the Tennessee line.

Q Do you recall, though, whether or not any coal, any Midwest coal, that is, coal mined in Illinois, Indiana and West Kentucky, went into the eastern half of Tennessee?

A No, normally it wouldn't, because you are getting into the Eastern Coal Fields there.

Q Incidentally, Mr. Tarzy, the coal mined in Illinois, Indiana and West Kentucky is referred to as what coal field, if there is a name for it?

A We referred to it as the Midwest Coal Field.

MR. HEDLUND: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

BY MR. CUSACK:

Q Mr. Tarzy, I would like to ask you a few questions in regard to the general consumption of coal in the Midwest.

Among the conventional steam electric [316] plants in the State of Illinois—

Or are they more properly called steam generating plants?

A Yes.

Q (Continuing) —in the State of Illinois and in the Midwest, about what per cent of their fuel energy requirements are supplied by coal?

MR. HEDLUND: If you know.

BY THE WITNESS:

A Well, it is the predominant fuel, but to guess at the exact percentage, it would strictly be a guess.

BY MR. CUSACK:

Q Do you know whether or not the use of coal in the steam generating plants in Illinois and in the Midwest in recent years has increased or has decrease?

A I would say it would be on the increase.

Q And what fuels, if you know, have been on the decrease?

A Well, I think due to the ability of some of the natural gas companies to develop storage facilities, and what-not, I would believe that the consumption of gas—this you would have to take [317] from my knowledge of the marketing situations I ran into when I was familiar with it.

A good example, I would say, would be that Commonwealth Edison, for instance, used to use a lot of dump gas, and at the time I left, they had curtailed that substantially because of their installation of larger units and reduced transportation costs, and so forth, and so on.

Q Would you say generally, Mr. Tarzy, that the Illinois public utilities' use of natural gas has substantially declined over the last ten years?

MR. HEDLUND: If you understand what Mr. Cusack means by "substantial."

THE WITNESS: I think I know what he means.

BY THE WITNESS:

A I would say from my experience, when I was trying to sell coal, say ten years ago, we ran into the dump natural gas problem, sales-wise, more than we had, say maybe during 1965 or 1966.

BY MR. CUSACK:

Q Mr. Tarzy, do you have any information or do you have any opinion whether the use of coal by the steam generating plants in Illinois and in [318] the Midwest will increase or will decrease or will remain about the same in the next, say five or ten years?

A Well, along with some of the statistical work that I did, that was, of course, part of my job, trying to forecast what the utilities that we were particularly serving, or could possibly serve, would do, and we would have interviews with the utility people that we were dealing with, and also refer to any possible information that might be published anywhere else, primarily some of the forecasts that were made by, I believe, Joe Forsythe

of the Keystone Coal Buyers, and of course he was very bullish on the utility coal market, and we came up, if you just want a general answer from me on that, that there would be an increase in the coal burned.

Q In the Midwest?

A In the Midwest.

Q And in Illinois?

A And in Illinois.

This, of course, was prior to all this talk, which was becoming more alarming about the time that I left, in connection with air pollution [319] and nuclear power and all the rest of these things that we heard, and I don't know whether the experts now have revised their figures or not, because that was pretty substantial competition about the time I left to go out west.

* * * *

[324] A I read an announcement, I believe it was either in the Wall Street Journal or maybe one of the local papers in the Phoenix area, that due to their anticipated delay in bringing in some nuclear units that they were planning on building some coal-fired units. Is that what you are referring to?

Q Yes.

Mr. Tarzy, do the electrical utilities in Illinois prefer coal over oil?

MR. HEDLUND: If you know.

BY THE WITNESS:

A Well, in my experience, yes, because oil was, from the standpoint of economics, not in the picture.

BY MR. CUSACK:

Q Was it more expensive?

A I would say, generally speaking, yes.

This is for the utilities, now, you are talking about?

Q Yes.

A Because there are a number of small installations that burn oil, you know.

Q I understand.

[325] Do you know why the electrical utilities in Illinois prefer coal over gas?

MR. HEDLUND: If they do.

BY MR. CUSACK:

Q Do they?

A No. In fact, I imagine, with some of this activity on air pollution—

In fact, I recall reading something again there in connection with Commonwealth Edison, where, at one of their Chicago plants, they felt that they were forced to burn some natural gas because of some pollution problems they were having in one of their Chicago area plants.

Q By "forced," do you mean they would have preferred to burn coal?

A Yes, because I would think that in that particular instance coal would be probably more economical to use than gas.

Q As a general rule, is coal more economical to use in Illinois, by electrical generating stations, than natural gas?

A If you will exclude the use of dump gas, I think the answer to that question would be yes.

Q And has the use of dump gas declined?

[326] A I think I answered that before.

Q Has it declined?

A Yes. The records would show that, but we felt, in our sales activity, that it had declined.

Q Is it fair to say, Mr. Tarzy, that the electrical utilities in Illinois rely heavily on coal?

A There again I know what you mean—

Q Let me rephrase the question.

Is it fair to say, Mr. Tarzy, that the electrical generating companies in Illinois rely primarily on coal as the fuel to power their stations?

A Yes.

Q Is this also true for the Midwest?

A Are you talking about the utilities that use Midwestern coal?

Q Yes.

A I would say, generally speaking, yes.

Q Other than electrical generating companies, Mr. Tarzy, what other fuel consumers rely primarily on coal?

A That is another one of those general ques- [327] tions, but you have cement plants, you have corn processing plants.

* * * *

[385] Q And do you know where this coal ended up?

A Yes. I believe it was in connection with a shipment that was going to Rail-to-Water. It must have been, because Mr. Sheridan, I believe, was their coal inspector or the fellow who handled their inspection at Rail-to-Water.

Q That is the Mr. Sheridan who is referred to in the first paragraph of this document?

A That is correct.

Q Do you know how much was involved in this shipment?

A Well, it was 1965, so that would be under the new unit train regulations. Well, the unit train regulations require that you ship a volume of coal. Now, whether this was 2,000 tons, 3,000 tons, but it would be in that neighborhood, because it required, in order to get the lower transportation cost, that you had to ship, you know, a part of a unit train or on a volume rate.

Q It is a fact, is it not, Mr. Tarzy, that in 1965 Freeman purchased a substantial amount of coal from the Fidelity Mine of United Electric, which coal was shipped over Rail-to-Water?

[386] A I don't know what you mean by "substantial." We had hoped it would be a lot more than it was, because we needed the business, but—

Q Approximately how much was it?

A I am going to guess. The records would show, but I am guessing, strictly a guess, I would say maybe 50,000 tons, maybe 75,000 tons.

Q Was it at least 50,000 tons?

A That is a guess.

Q In 1966, Mr Tarzy, can you give us approximately how many tons the Fidelity Mine of United Electric supplied to Freeman for shipment over Rail-to-Water?

A This is another, strictly a guess, I would say approximately it would be about the same amount.

Q Approximately 50,000 to 75,000 tons?

A I am guessing. Now, don't hold me to it. The records of the company would show it, and it would be very easy to dig that information out.

As I said, we hoped it would have been much more than that, but to us, it was a small shipment in propor-

tion. I think we were producing, I don't know, about five million tons of coal, or [387] something, at that time, so that would be kind of a small percentage of our business.

* * * *

[389] That movement, I think, involves an annual [390] movement in excess of three million tons per year in shipments of 10,000 tons per shipment, and in this particular case they have even gone one better, with the rail equipment to be supplied by the customer, in this case Commonwealth Edison, and a further advantage in that case where the coal would originate from a mine on the same railroad to which the coal is delivered; in other words, a one-line haul. There you have all the components wherein a real economy could be accomplished, by a volume movement of coal via the unit train.

BY MR. CUSACK:

Q Thank you.

Mr. Tarzy, you testified that since December of 1966 you have been stationed in Phoenix, is that correct?

A Well, Phoenix and Sun City.

Q Do you have an office down there?

A My office is in my home now.

Q And that is in Sun City?

A Yes.

Q What do your duties consist of at the present time, and since December of 1966?

A Well, I am vice-president of Western [391] Operations.

I believe I went into this thing yesterday, didn't I?

Q Not completely.

A Oh, yes. I see what you mean.

Vice-president of Western Operations of The United Electric Coal Companies, and my duties are to coordinate and supervise the activities of our company and the marketing and exploration of coals in the western area of the country.

Q By "our company," do you mean United Electric?

A United Electric, yes.

Q Are you only employed by United Electric?

A My salary check says United Electric Coal Companies.

Q Are you only employed by United Electric?
A Yes.
Q And who reports to you, Mr. Tarzy?
A It seems like I am reporting to somebody else. I report to the president of United Electric.
Q And that is Mr. Camicia?
A Mr. Camicia.

* * * *

[412] Q Do you know the ratio of it?
A No.
Q How many tons of coal does United Electric control by location at that deposit?
A I don't know.
Q Do you have any estimate?
A No.
Q All right. Other than the Oklahoma reserves, the New Mexico reserves, the Wyoming reserves, and the two Colorado reserves, what other reserves does United Electric own out West, either directly or indirectly?
A I don't know of any other.
Q Does United Electric own any reserves or look for any reserves at the Black Mesa, Arizona, area?
A I wasn't particularly involved in that thing, but I believe our engineering department was, yes.
Q Did United Electric do any prospecting at the Kaiparowits Plateau in Utah?
A We didn't do any exploration as such, but we did work on that property, on the Kaiparowits, [413] yes.
Q Well, could you tell us, very briefly, the properties that United Electric has prospected for out West?
MR. HEDLUND: Other than the ones that you have mentioned.

BY THE WITNESS:

A Well, I think it would be best to indicate to you—I want to be as helpful as I can on this thing—the projects that we are working on out there, out West—

BY MR. CUSACK:

Q Do you mean at the present time?
A Yes.
Q Fine.

A —that indicate to us the best promise, rather than trying to dig up some of this stuff that we probably know about out there but that show no immediate promise.

The largest project that we are interested now in working on out there is known as the Kaiparowits project. This is an area located in Southern Utah.

MR. HEDLUND: May I interrupt for just a [414] moment?

I had mentioned this, I think off the record, before we started, that you are in an area of high degree of confidentiality. The deposition won't be filed, but I would assume that this information will be covered under the protective order so that this may remain confidential.

You have been given a number of documents about the Kaiparowits Plateau, and Mr. Tarzy may be on the verge of giving you additional information. I want to make certain that the confidentiality of this material is maintained.

MR. CUSACK: That is agreeable.

MR. HEDLUND: Fine.

You may continue, Mr. Tarzy.

MR. CUSACK: Can we take a five-minute break?

MR. HEDLUND: Yes.

(There was a short recess, after which the taking of the deposition was resumed as follows:)

BY MR. CUSACK:

Q All right, Mr. Tarzy. Could you tell us [415] about the Kaiparowits Plateau and United Electric?

A Yes. I will try to make it as brief as possible.

Sometime prior to my going out, or being sent out to Arizona, we had received inquiries from what we called the Resources Group as to our interest in possibly mining some coal reserves that they held in the Kaiparowits Plateau region.

Q Who are the Resources Group?

A The Resources Group comprises the Southern California Edison Company, the San Diego Gas and Electric Company, and the Arizona Public Service Company.

Q I see. Thank you.

A They have, under lease, 45,000 acres of coal lands, or lands under which there should be coal, in the Southern

Utah area, not too far from a proposed power plant site on the northern shore of Lake Powell, which is astride the Arizona-Utah line at that point.

Q That is the Colorado River, isn't it?

A Yes.

Q Lake Powell was created by a dam on the Colorado River, is that right?

[416] A That is correct.

So we became interested in that project, and that was one of my first opportunities to get into the western coal thing.

If it developed as projected, they propose to develop a power plant there, fueled by coal, which will have an eventual capacity of 5,000 megawatts, which will require approximately 15 million tons of coal per year over a 35-year period.

Q Will this be a plant located at Lake Powell?

A Yes.

Q And how far is this from the coal fields?

A From the center of the coal fields controlled by the Resources Group, we had estimated it would be somewhere around 11 or 12 miles. The shortest distance probably was maybe 8 miles, 6 miles, something like that.

Q So the coal field then is almost adjacent to where they plan to put the power plant?

A Well, I wouldn't use the word "adjacent," because the cost of moving that coal, say 11 miles, is going to be a substantial portion of the total costs.

[417] Q Would this be by conveyor belt?

A Well, this is what we are considering, and have so suggested in the proposal that we have made.

Now, this project, of course, if it develops, would, to my knowledge, be the largest single power plant development in the country, and maybe in the world, as far as I know.

In addition to the 15 million tons of coal per year that they will require for 35 years to supply these units, if they are all put in, they are also investigating the possibility of using a liquefaction plant in connection with supplying the plant with its fuel.

Q The liquefaction means what, sir?

A This would mean that the coal, after it would be mined, would go through a processing plant which would

extract the hydrocarbons, et cetera, from the coal, and the resulting char, which is the material that would be left after its carbonization, would be sent to the plant to be burned as boiler fuel.

On that basis, if a project like that would develop, it would require the use of approxi- [418] mately 30 million tons of coal per year for 35 years.

Q Just one thing, first. This power plant, where would its electricity go to?

A Well, are you familiar with the WEST Group?

Q Yes.

A Well, the WEST Group, of course, is composed of practically all of the important utilities out west, and if a plant like this would develop, the Resources Group would give the participants in the WEST program an opportunity to take, I guess, a proportionate share of the electricity that would come out of this plant.

Q Does this mean that the electricity coming out of this plant would be transported, as it were, by high transmission wires to, for example, the Southern California Edison Company?

A Yes.

Q In other words, the utilities on the West Coast?

A Yes. That is where your biggest growth is.

Q Approximately how far, then, would this [419] electricity be transmitted? In other words, approximately how far is the generating station on Lake Powell to the customers which would use this electricity?

A Well, part of it will probably go down to Phoenix, and that would be a distance of about 180 miles, I would say, or so, but your main power load—

That is the Glen Canyon Dam (indicating).

Q The Glen Canyon Dam is the dam that created Lake Powell?

A Correct. And the power plant location would be on the northern shore of Lake Powell.

Q That is in Utah?

A In Southern Utah, correct. Almost on the Utah-Arizona line.

So the power could come down to Phoenix, it could come out here (indicating).

They are building a plant here, on the Colorado River, you know, at Mohave.

Q That is to be supplied by Peabody?

A Correct. From the Black Mesa.

Q That is the Southern California Edison plant, is it not?

[420] A Well, no. There are several utilities involved in that. That still is under the WEST concept.

Q That is W-E-S-T?

A It is all capitals. W-E-S-T. That is Western Energy and Transmission—something or other.

So this power would tie in with the lines that they are already building in connection with this plant.

As you know, they have a big plant here at the Four Corners area.

Q WEST does?

A Well, certain members of WEST.

Q The Four Corners area is near Farmington, New Mexico, is it not?

A That is right.

So you asked the question about where the electricity would go, it would feed into the grid that is already in the process of being built.

Q And most of it would eventually end up in the Los Angeles area, the Southern California area?

A The biggest growth is there, and so far, [421] in most of the developments of this type, Southern California Edison has always taken the biggest share of it, because they are the largest utility involved, and they have the largest growth and the largest requirements.

Q Now, in regard to the supplying of the coal to this generating station at Lake Powell, is there any name for this station, by any chance? Is it referred to by any particular name?

A It is in such a preliminary stage, they still call it a project, the Kaiparowits Project.

Q I see. Now, do you believe that United Electric will be the coal company to supply this generating station?

A I am hoping that United Electric, and the work that we have been doing on it, will certainly have an opportunity to share in the development, if it does occur.

Q What other coal companies are active in this development?

A When they ask for bids—not bids; I should not say that, because it was strictly preliminary. I think

it was a matter of trying to create some interest by responsible coal companies, [422] and I believe they did publish a list of the companies that did attend the preliminary conferences, and among those companies were Peabody Coal Company, Consolidation Coal Company, North American Coal Corporation, of course United Electric, United Electric-Freeman.

Q In other words, all the leading United States producers?

A Well, for some reason or other, a good many of the so-called Eastern producers, and I think there was one other name, maybe Carbon Fuel, was the only name that I remember seeing on the list.

But anyway, they did publicise it, and all the companies that were interested did attend this initial conference.

Now, I don't know how many did actually submit proposals to mine this coal, other than ourselves, but I presume they did have some.

MR. CUSACK: Counsel, would you please furnish us with a copy of the United Electric proposal?

MR. HEDLUND: If you will add that to your letter.

[423] MR. CUSACK: Thank you.

BY MR. CUSACK:

Q When was this proposal submitted, Mr. Tarzy?

A This proposal was submitted in, I believe it was March of 1967.

Q Has it been acted upon yet?

A No.

Q If WEST accepts the proposal of United Electric, approximately how many tons of coal would United Electric expect to mine in this area?

A I wish I could answer that question. Let me, if I may—

MR. HEDLUND: I believe the witness has testified to estimates on the total amount of coal that will be mined per year. He has also testified that this may be a sharing proposition.

MR. CUSACK: And I am trying to determine, on that basis, approximately how much Mr. Tarzy estimates United Electric would be moving.

BY THE WITNESS:

A Well, let's get into a point here that I think you should know.

The Kaiparowitz coal lands are located [424] such—well, the project is known as the Kaiparowits Plateau Project, so it is located in and around a plateau, and we have what we think is a rather unique or unusual proposal, because United Electric proposes to go in and open up the operation by stripping some of the areas that indicate that there is some stripping available, but it is going to be a very small portion of the total tonnage that is going to be recovered from that acreage, so rather than go into a project of that size with such a small contribution, we have encouraged Freeman Coal Mining to join with us to back up our proposal, so to speak, because as soon as the little strip coal, if they decide to go that way, is mined, the majority of the coal has to be deep mined, and there again, that is the function of Freeman Coal Mining, and as I have said before, it is fortunate that we have them to back us up on a proposition like this.

BY MR. CUSACK:

Q Did Freeman join United Electric in this proposal to WEST?

A Yes, I think you will find that they are mentioned, and their capabilities in the deep mining [425] field, are mentioned in this proposal.

It is logical, and I think it made a good proposal, and I think it was well received that here were two companies, one who had expertise in strip mining and the other who had expertise in deep mining, to go in there and make a proposal to develop this property. I think it had a very beneficial effect, and without something like that, I don't think we would have gotten much consideration.

[426] Q When do you expect this contract to be awarded, if at all?

A Well, the group has been having projected negotiations on getting their water rights established, which is a very important thing.

Q Which group is that?

A Well, the Resources Group, the ones that are originally developing this, those three companies that I have mentioned.

I think they have got those negotiations pretty well behind them now. It is going to take an agreement with the Secretary of Interior as to the cooling water requirements for the plant, and so forth, and so on, and as soon as that thing is behind them, they have indicated to us that they will ask us to further refine the original proposal that we made in 1967. In other words, things can happen inside of a couple of years, and they have asked us, for instance, and which we have supplied them, with information as to what our estimate would be to maybe open up a test drift to determine what the mining conditions might be underground. I mean, you just can't use x-ray eyes and see what is underground; we want to know what the roof con- [427] ditions are, and what the floor conditions are, and so forth. So it is about in that stage.

I don't think there is much more I can add to it, unless you can think of something.

Q How thick is that coal seam at Kaiparowits?

A Oh, yes, that is a very important thing. It is a multiple-seam area, in which they have found as many as probably ten seams of coal in the coal-bearing strata, and the thickness of the coal would vary. Of course, I don't think they are considering anything under four feet as commercially minable, and the coal seams go up as high as 25 to 30 feet thick, so you will have a series of coal seams, some of them four feet thick, some of them ten feet, some of them 20, and the good thick ones, maybe 25 feet or so.

Q All right. Thank you.

Other than the Kaiparowits Plateau Project, has United Electric submitted any other proposals, or is it looking at any other coal reserves out in the West?

A Yes. Let me refer to one other proposal that shows some promise, and that is a proposal [428] to mine land that is owned or controlled by the Public Service of New Mexico.

• • • •

[5]

EXCERPTS FROM DEPOSITION OF BURL CHARLES JENSEN, TAKEN NOVEMBER 21, 1968

* * * *

MR. SAMUELSON: Mr. Jensen, will you speak up, please, so Mr. Futterman can hear you, too.

THE WITNESS: Yes.

MR. FUTTERMAN: Thank you, Mr. Samuelson.

BY MR. SIMS:

Q Were you given any particular title when you came to work with UEC in 1963?

A Yes; the title of geologist.

Q How are you employed at this present date?

A My title at present, my present title, is Production Engineer.

Q You are still employed by UEC?

A Yes.

Q Are there any other geologists now working for the UEC company?

A No.

Q When you came to work for UEC, were there any other geologists in the company?

A No.

Q Were you the chief geologist of United Electric, so to speak?

MR. SAMUELSON: You mean, the chief and only geologist?

MR. SIMS: Right.

[6] BY THE WITNESS:

A I was the only geologist.

BY MR. SIMS:

Q What other types of duties did you perform, let's say, while you had the title of geologist at UEC, when you first began working at UEC?

A I explored for coal mostly in the western United States and somewhat in Illinois. I estimated or evaluated

property, as far as coal reserves are concerned, in Illinois and in the western states.

Q Did you initiate what areas you would go in to explore, or were those areas designated to you by someone else?

MR. SAMUELSON: Would you repeat that question, please, Mr. Youker? I do not understand it.

Q (Read by the Reporter.)

MR. SAMUELSON: Do you understand the question? If you do, you may answer.

THE WITNESS: Would you repeat the question again, please?

MR. SIMS: Read the question again, please, Mr. Youker.

* * * *

[70] MR. SIMS: In other words, the witness may not have seen this map? I mean, you did not show this map to the witness?

MR. HEDLUND: Well, I do not know. You can ask him. We have not shown him this map in the past two or three days.

MR. SIMS: Does your objection to the forty-eight-hour rule still stand as to this document?

MR. HEDLUND: I have explained my interpretation of your letter, which was not clear, but you may continued with it, if you want to.

MR. SIMS: Tarzy Deposition Exhibit 1 purports to be a map of Illinois, western Indiana and western Kentucky, dated December, 1963, published by the Paul Weir Company, also entitled, "Shipping Coal Mines."

BY MR. SIMS:

Q Mr. Jensen, have you seen this document before?
A Yes. I have seen this document.
Q Where have you seen it?
A I would say in our office.

MR. SIMS: Off the record for just a [71] moment, please.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. SIMS: On the record.

Does the standing stipulation apply to Tarzy Deposition Exhibit 1?

MR. HEDLUND: Yes, it does.

MR. SIMS: Thank you.

BY MR. SIMS:

Q Mr. Jensen, have you ever noted any inaccuracies on this map?

A I have never noted any.

Q Based on your knowledge and experience and the authorities you rely on as a geologist, does the area covered in green correctly delimit the coal bearing strata in Illinois, Indiana and western Kentucky?

MR. SAMUELSON: By "correctly", you mean what?

MR. SIMS: Accurately.

BY THE WITNESS:

A I would say in a very general sense it shows the approximate location of the coal-bearing [72] strata in this area.

BY MR. SIMS:

Q Would you say this area colored in green is a geologically united coal region?

A Geologically, yes.

Q In other ways do you believe this map is accurate?

MR. SAMUELSON: What was the question again, please, Mr. Youker?

Q (Read by the Reporter.)

MR. SAMUELSON: Could you define the "other ways", and also repeat the question?

MR. SIMS: The facts it purports to set forth on this map.

MR. SAMUELSON: What are those facts it purports to set forth, as stated on the map?

MR. SIMS: The document speaks for itself.

MR. SAMUELSON: Are you familiar with all of the facts that it states on this document? Are you familiar with the seam used, the carrier, the town and the county of all the mines mentioned on this map?

MR. SIMS: Is this a voir dire examination, Mr. Samuelson?

* * * *

[99] Q You testified before that you have used these circulars during your work.

A Yes.

Q Can you point to any specific areas in which you feel that the IGS was incorrect in a particular circular when they said that Class 1 reserves would be present with reasonable certainty?

MR. SAMUELSON: Are you asking, can he, or will he at this time?

MR. SIMS: From his knowledge.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

MR. SAMUELSON: Do you have the question?

BY THE WITNESS:

A Yes. I do not remember the exact circular, but I believe the Sepo area is one area that—

BY MR. SIMS:

Q The Sepo area?

A Yes.

Q Do any other areas come to mind?

A Yes. I can remember the Augusta area.

Q Can you think of any others?

A I can remember the Roodhouse areas.

[100] Q Have you finished, Mr. Jensen? Are there any others?

A Any others?

Q Yes.

A I would say the Ottawa area. Is that enough?

Q I would like for you to cite as many areas as you can think of.

A More areas?

Q Yes.

A I would say the Galva area. I can't think of any more right offhand. I am sure there are more, though.

Q From your present recollection, can you think of

any areas in your drillings and experience that there has been coal, strippable coal, where the IGS indicated there was no strippable coal?

A Would you repeat that, please?

MR. SIMS: Will you read the question, please, Mr. Youker?

Q (Read by the Reporter.)

MR. SAMUELSON: Do you mean strippable coal as defined in the IGS circulars?

MR. SIMS: Yes.

* * * *

[170] BY MR. SIMS:

Q Mr. Jensen, do you remember making an estimate for UEC on the tonnage of coal that could be recovered by the stripping method in the Sun Field area? I believe this area is mainly around the city of DuQuoin's water supply lake.

A I recall that area, yes, sir.

Q Do you recall making an estimate with respect to this area?

A Vaguely.

Q Do you remember what the estimate was?

A (No answer.)

Q Do you remember what the estimate was?

MR. SAMUELSON: What do you mean by "what the estimate was"? Total tonnage, overburden, what?

MR. SIMS: I asked him in the previous question, did he make an estimate for the company with respect to the tonnage of coal that was recoverable and could be recovered by the stripping method in the Sun Field.

MR. SAMUELSON; And he said vaguely.

MR. SIMS: He said vaguely.

* * * *

[5]

EXCERPTS FROM DEPOSITION OF THOMAS H. LATIMER, TAKEN DECEMBER 3-5, 1968

* * * *

Q What was its successor's name?
A The Lake Charles Products Corporation.
Q What were your duties at this company?
A I was the Assistant Manager and Treasurer of the company.
Q When you left this company, where did you go to work?
A I was a District Engineer for the WPA in Southwest Louisiana.
Q What is the WPA?
A Works Progress Administration.
Q How long did you stay with the WPA?
A Until late 1936.
Q Where did you go from there?
A I came to work in January of 1937 for United Electric.
Q 1937?
A Yes.
Q What business was Lake Charles Products engaged in?
A We were manufacturing an edible cellulose.
Q You said you were an engineer with the WPA?
[6] A Yes.
Q Did you have any engineering training?
A Only what I picked up by association with other people, and by study, studies at home, and so forth.
Q What was your title when you came with UEC?
A I had no title. I was an instrument man in a survey party.
Q How long did you stay at this level?
A Not long. I was in the Engineering Department until about 1957, the Engineering and Operating Departments.
Q What other types of jobs did you have in the Engineering Department?
A All the engineering connected with the mines and operating the mines, except the mechanical engineering.

Q In 1957 what position did you attain?

A I still worked with the Engineering Department, but much more of my time was devoted to buying property.

Q Did you have—

A I might say that I started buying that [7] property on the side probably around 1939.

Q You started buying property around 1939?

A I think so.

Q For the company?

A Yes.

Q Did they tell you around 1939 that this would be an additional duty that you would have?

A I don't know that I was told it would be an additional duty. It was work I had to do. I was told to do it.

Q Were you put under any other superior at this time, or did you stay under the same superior?

A No. I was under the same superior.

Q Who was that?

A Until 1953.

Q Who was that?

A H. A. Reid.

Q What was his position?

A He was a Chief Engineer until early 1941, and then Vice-President until his death in 1953.

Q Vice-President in charge of what? Operations?

A Operations, yes.

[8] Q Now, Mr. Latimer—

A Pardon me, sir.

Q Yes.

A During several years of that I also reported to Guy Shorthouse, who was the General Superintendent. I worked very closely with him.

Q This was all in the Engineering Department?

A Engineering and Operating, yes.

Q Did UEC have a Land Department at that time?

A We never have had a real Land Department.

Q The duties of acquiring land or optioning land was really a function of the Operating Department?

A Of the Engineering Department. Most of the time I was the only one engaged in it.

Q You said you started buying land in 1939?

A Yes.

Q In 1957—why did you set this date apart?

A Why did what?

Q You mentioned before in 1957 that you [9] began buying land for the company.

A Not "began." I devoted more time to it.

Q I was under the impression that you distinguished the year 1957. What occurred in that year?

A Mr. Inman came into the—Inman was running the Engineering Department at that time.

Q And you began reporting to him?

A No. I reported from 1953 to 1964 to—well, during 1954 and 1955 to Mr. Shorthouse and H. D. Pinckney, who was then the Vice-President in charge of operations, and then to Mr. Hepburn.

Q But you never reported to Mr. Inman?

A No, no. I skipped over one thing. I did report, from 1948 to 1950, to G. H. Utterback, who was then Chief Engineer.

Q When did you begin reporting to Mr. Hepburn?

A As soon as he took over the operations in, I think, late 1955.

Q Did your duties change materially after 1939?

A After 1939?

Q Yes.

A Oh, yes, indeed. They were broadened [10] out more in the Engineering Department and in the Operating Department, as I knew more about the work.

Q In what manner were they broadened out?

A Well, the prospecting of new fields, the mapping of fields, estimates on production, estimates on coal tonnages and so forth.

Q In other words, as you began learning more about the business, you were given more freedom to go out and investigate fields?

A Certainly.

Q Did your title change in any manner?

A I do not think I ever had a formal title until two or three years ago.

Q Two or three years ago what title were you given?

A Manager of Lands.

Q Is that your present title?

A Yes.

Q You are presently now employed by UEC?

A Yes. I have everything to do with the property from the time it is thought of until it is mined and then after it is mined, the reclamation.

* * * *

[58] Q Did anyone in UEC instruct you to write this memorandum to Mr. Hepburn entitled, "Deep Coal Reserves in Southern Illinois"?

[59] A To the best of my memory, no.

Q Why did you write it?

A I wanted reserves.

Q Will you explain your answer?

A We knew our strippable reserve was limited. We needed reserves to keep us going.

Q Was this in southern Illinois or just generally?

A In general.

Q Is it your testimony, then, that to keep United Electric in business it was necessary to get more reserves?

A May I have that question read again?

MR. SIMS: Yes. Read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A Yes.

BY MR. SIMS:

Q Was it necessary to get deep reserves?

A Both strip and deep.

* * * *

[79] Q Do you know any reason why they have not acquired this property or optioned it?

[80] A To me the field does not look like much hope.

Q Didn't you just state that you would advise that they should option it?

A I would today. We need reserves badly.

Q Then why did you just state that it does not look like it is much hope?

A It doesn't.

Q In what regard do you mean?

A The information from the previous drill holes was inconclusive.

Q Then would you recommend that more drilling be done in the area?

A I think so.

Q Do you think there is a possibility that there are minable coal reserves in the area?

A Slight.

Q By "slight", how much do you mean?

MR. HEDLUND: Do you mean, how much of a possibility does he mean?

MR. SIMS: Yes.

BY THE WITNESS:

A We have proven no coal reserves at all there.

* * * *

[84] Q Did you ever hear of the Salt Fork Field, consisting roughly, I think, of 6,000 acres in [85] Vermilion County?

A Yes.

Q Did you acquire options in this area for UEC?

A I had it done.

Q Do you know about when this was done?

A I would think in the late 1950's.

Q Do you know who took the options?

A If I didn't, E. B. Campbell did.

Q Who is he?

A A former employee of ours.

Q Is he still alive?

A As far as I know.

Q Where does he live?

A Kewaunee, Wisconsin.

Q Do you know when he left UEC?

A Within a year after those options were taken, I believe.

Q Did UEC do sufficient drilling, in your opinion, to determine what tonnage was in the area?

A Enough to give a rough estimate.

Q Do you know what the estimate was?

A I believe I would have to refer to the record.

[86] Q Approximately.

A I believe about 40,000 tons.

Q Did UEC exercise its options in this area?

A No.

Q Why did they drop the area?

A The overburden was quite heavy and it was not suited to any equipment we had.

Q Do you know how high the overburden was?

A There was no shallow overburden at all. It went directly from the river up to within a very short distance, perhaps to 85 feet, from there to over a hundred. In fact, I believe that the field averaged 101 feet.

Q You say it was not suited to any equipment UEC had at that time?

A No.

Q What did you say?

MR. HEDLUND: That is exactly what he said.

BY MR. SIMS:

Q Is that what you said?

A That is what I said.

Q This was in the late 1950's?

A I think so.

[87] Q Do you know if anyone has picked up this field, any coal company?

A On the Vermilion County plat book, Ayrshire Collieries is shown as the owner of some of the field.

Q About what portion of the field?

A I don't remember.

Q Who is Miller Spears?

A In connection with what?

Q I really do not know anything about his title or his company. The particular memorandum I am refer-

ring to discusses the Danville or Collison area. Does this refresh your recollection?

A Collison?

Q Collison. Does this refresh your memory?

A I think so.

Q Who would he be, then?

A It sounds like Miller Spears.

Q Who would Miller Spears be?

A His people have so many different companies, I don't know which company he would be connected with.

* * * *

[165] Q After he was dismissed did UEC acquire any options in this area?

[166] A No.

Q Do you know why UEC has not gone into this area?

A I would have to read the contract with Bennett to tell you. However, the field is not attractive.

Q Why is it not attractive?

A It goes under the town of Galva. Your property would go right practically to the edge of town.

There are two hard roads cutting through it and two railroads cutting through it.

Q Mr. Latimer, you did recommend to UEC, did you not, that they hire this man to pick up the field?

A No, sir, I did not.

Q You were against this?

A I was certainly not for it.

Q Who did recommend that he be hired?

A I think Hepburn felt that we should take a chance on anything.

Q You mentioned something about a contract that you felt had something to do with UEC not going into this area?

[167] A I say, I would have to read that contract, but it is not an attractive area, anyhow.

Q But you do think there was a contract provision with Mr. Bennett that excluded UEC from going into the area?

A There might have been for a short time. I don't know.

Another thing I ought to point out was the old works in there, an unknown area.

Q You know, do you not, that Peabody has picked up these reserves?

A No. I do not know it.

Q Do you doubt this?

MR. HEDLUND: Oh, now, come on. I believe you are arguing with the witness. I am going to object to that. He said he does not know.

MR. SIMS: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. SIMS: Let the record show that the deposition of Mr. Latimer is being recessed until tomorrow morning at 10:00 o'clock.

(WHEREUPON the taking of the deposition of T. H. LATIMER was recessed until 10:00 o'clock a.m. of the following day.)

---

* * * *

[194] BY MR. SIMS:

Q Mr. Latimer, I direct your attention to the last paragraph of this document, on page 2, and the last sentence, which reads:

"I am inclined to believe that much of this coal is owned in large blocks by the owners or descendants of owners of the old mines and could be acquired at a pretty recent figure."

Did you check on this—

MR. HEDLUND: Did you say "decent" or "recent"?

MR. SIMS: I said "recent."

MR. HEDLUND: I believe the document says "decent."

MR. SIMS: Right.

BY MR. SIMS:

Q Did you check on the ownership of the blocks?

A I checked on some old records in our files. That is as far as I went.

Q Did UEC acquire any options in the area?

A No.

[195] Q Do you know why?

A This is strictly a deep mining proposition. Location-wise it is very good.

As far as the mining conditions are concerned, I understand it is not good.

Q From whom did you understand this?

A The mining conditions?

Q Yes.

A The coal miners.

Q Did you check with the Geological Survey as to the mining conditions?

A I think not.

Q Does any of their literature discuss, or do any of their publications discuss the mining conditions, the deep mining conditions—

A Not that I remember.

Q —in these two counties?

A Not that I remember.

Q Would there be a possibility of locating, say, at least fifty million tons of minable deep coal in these two counties?

A I don't know.

• • • •

[205] Q Mr. Latimer, does this letter reflect the facts as you knew and believed them to be at [206] the time of the writing thereof?

A Would you repeat that, please?

Q Does this letter reflect the facts as you knew or believed them to be at the time of the writing?

A Yes.

Q I direct your attention to the first paragraph, the first sentence, which reads:

> "We have discussed your proposition of the Du-Quoin Lake area and while we are interested in the area east of the hard road south of the black top road running east from the Sunfield 'Y'."

What was Mr. Heap's proposition on the DuQuoin Lake area?

A He held some options that he was trying to sell us.

Q Do you know how extensive these options were?

A Pretty extensive, but I can't remember the amount.

Q In the second paragraph, the first sentence reads:

"For your information our preliminary [207] estimate of the recoverable coal in this area is in the neighborhood of 12,000,000 tons . . ."

Did he have options in this area that you estimated?

A I don't remember.

Q Were there any other part of this proposition besides the mere selling of the options that he had?

MR. HEDLUND: May I have that again, please, Mr. Youker?

Q (Read by the Reporter.)

MR. HEDLUND: I do not believe that is a question, Mr. Sims.

MR. SIMS: Strike the question.

BY MR. SIMS:

Q Were there any other aspects of the proposition Mr. Heap made to you besides his selling to UEC the options that he had?

A I do not remember.

Q Do you remember any details about the selling of the options?

A No, I don't.

Q The second paragraph of the document, the last sentence, reads:

[208] "As you know, on an area of this size we feel that about 80 feet is the economically strippable depth though this height is due to change depending upon the estimated drilling and blasting cost."

Was the 12,000,000 ton estimate—strike that.

Was only coal under the 80 feet of overburden included in the 12,000,000 ton estimate?

A I don't remember.

Q Would this probably have been the case?

A It could be.

Q Do you estimate coal in an area that you do not consider economically strippable?

A Do we estimate coal that we do not—

Q Consider economically strippable.

A Yes.

Q But you do not know if that was the case in this particular instance?

A I cannot remember.

Q Do you know what Mr. Heap's estimate was on the coal in the area?

A Greater than ours.

Q Was it substantially greater, twice as [209] great, say?

A I don't remember.

Q What is the minimum amount of coal that you consider to be in this area, let's say under 80 feet of overburden?

A I can't remember.

Q Would it be over 5,000,000 tons?

A I imagine.

Q Has any data come to your attention or has a company drilled in this area after 1966 that would cause the company to change its estimate of 12,000,000 tons?

MR. HEDLUND: I object to that. That's two questions. I believe you first had better ask him whether they have drilled.

MR. SIMS: Let me rephrase the question, then.

BY MR. SIMS:

Q Has UEC drilled in this area after these discussions with Mr. Heap?

A I think not.

Q Has UEC acquired any data since the discussions with Mr. Heap that would cause you to change the preliminary estimate of 12,000,000 [210] tons in the field?

A Since this discussion?

Q Yes.

MR. HEDLUND: May I have the question read, please, Mr. Youker.

Q (Read by the Reporter.)

MR. HEDLUND: I do not believe, Mr. Sims, you have established when these discussions with Mr. Heap were or for how long they lasted. I do not think the record is going to be very clear in that regard unless you do.

MR. SIMS: I will rephrase the question, then.

BY MR. SIMS:

Q Mr. Latimer, do you know if any information came to the attention of UEC after the 12,000,000 ton estimate was made?

A I can't remember when we received accurate drill records on this property.

* * * *

[245] BY THE WITNESS:

A I would be very happy to answer that question if I could tell you without a reference.

BY MR. SIMS:

Q Could you give us an approximation?

A Not a close one.

Q Is there land now available to UEC west of Route 78 in North Canton Field that has strippable reserves?

A I don't know.

Q Is it possible that there is some land there?

A Available to United?

Q Yes, sir.

A Possible.

Q How much possible coal reserve tonnage is available to United Electric?

A I don't know.

Q Do you think it would be over five million tons?

A I don't know.

Q You have no idea whatsoever?

A I have nothing here to back up anything I say.

[246] Q Do you know if in the areas in which you drilled UEC exercised options or took leases?

A We bought some property.

Q Since 1960?
A Yes.
Q Does UEC still own this property?
A Yes.
Q Would you recommend that UEC do further optioning in this area west of 78 in the North Canton Field?
MR. HEDLUND: Mr. Sims, do you mean if they could?
MR. SIMS: If they could.
MR. HEDLUND: Under the present circumstances of the company?

BY MR. SIMS:

Q Will you answer the question, please?
MR. HEDLUND: May I have the question back, please.
Q (Read by the reporter.)
MR. HEDLUND: I object to the question. He may answer.

BY THE WITNESS:

A Perhaps.

* * * *

[281] BY MR. SIMS:

Q Mr. Latimer, do you know if there is a ceiling for the company in the North Canton Field?
A No, I don't.
Q Is United Electric at the present time interested in acquiring any additional coal reserves in the North Canton Field?
A Yes.
Q Are you prospecting in this area now?
A No.
Q Why not?
A We have no options.
Q Are you trying to take options?
A I haven't tried for some time.
Q Why not, Mr. Latimer?
A Frankly, I don't know where to go.

Q Would you explain your answer?

A We have discovered all the reserves in the east portion of the field that we know of, and in the west portion of the field there is no doubt there is property still owned by individuals. I don't know that it is coal reserve property.

[282] Q Before you find that out you have to drill it, do you not?

A You not only have to drill it, you have to be able to get together enough for an operation if you want it for yourself. If you want it for speculation, that is another thing.

Q How are you going to find out if there is enough coal in the east portion of the North Canton Field unless you drill it?

MR. HEDLUND: I believe he has testified that they have drilled the east portion of the North Canton Field.

BY THE WITNESS:

A We have drilled it.

BY MR. SIMS:

Q Why have you not then acquired options in the area?

MR. HEDLUND: I object to that question as contrary to what the witness has stated.

BY MR. SIMS:

Q Why have you not taken additional options in the area, Mr. Latimer?

A We are drilling, not only drilling, but we are behind in our drilling now in various [283] areas.

Q This is in the east portion?

A I didn't say that. I said in various areas.

Q What areas?

A At present, we are drilling at Buckheart, we may be drilling at Cuba. I haven't checked; we should be.

We should be drilling at DuQuoin.

Q Would you be optioning more in North Canton if you had the manpower?

MR. HEDLUND: I object to that question as you have not established that this drilling that has not been done is because of a lack of manpower.

BY MR. SIMS:

Q Is it because of a lack of manpower that you are behind in your drillings in the area?

A We are behind in our drilling everywhere.

Q why is that?

A We have no additional manpower or equipment.

Q How many drill crews do you have going?

[284] A I believe two.

Q Would that be one in DuQuoin and one in Fulton County?

A I don't think we have one running at DuQuoin. We may have a contract drill running there.

Q Do you have any other contract drillers?

A We have done lots of contract drillings.

Q At the present time do you have any contract drillings?

A At the present time contract drilling is very difficult to get.

Q At the present time does United Electric have any contract drillers?

A Not that I know of. We may have.

Q Is it a fact, then, that you now have two drill crews working?

A To my knowledge, we have two drill rigs working. How many crews are on those, I don't know. We may have a contract driller working at DuQuoin, but I haven't checked.

Q Where are these drill rigs working at the present time?

A I can't name the exact spots.

* * * *

[404] Q Again, directing your attention to Latimer Deposition Exhibit 31 I would like for you [405] to update this map.

Under the legend, across from the yellow block, are the words, "Owned in fee."

Could you point out on this map what sections are now owned in fee other than those marked on the map?

A Very few, if any. I would have to refer to the record.

Q You cannot from your present recollection tell us approximately where the areas would be?

A Struck, 40 acres.

Q Would you describe where that is located?

A Northwest southwest Section 24-62.

Q Are there any other areas?

A Three or four acres off the north side of the northwest southeast Section 23-62, and that is all I can recollect.

Q Mr. Latimer, in your opinion, has UEC been remiss in not acquiring more reserves?

A Where?

Q Anywhere.

A Do you mean at the present moment or recent past?

[406] Q At any time during your employment with UEC.

A Where do you mean?

Q In the State of Illinois.

A In the State of Illinois?

Q Yes. If you would like, you can refer to Nugent Deposition Exhibit 38.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY THE WITNESS:

A I think we have been remiss at times in the past.

BY MR. SIMS:

Q During what period?

A During the time I have been with the company.

Q Can you designate any specific period during which you have been with the company in which you thought the company should have been more aggressive in acquiring coal reserves?

A In the State of Illinois?

Q Yes, sir.

A Whenever coal was available, but we may [407] have not been remiss if we didn't have the money. I don't know.

Q In other words, under the circumstances you do not know whether it would have been wise for UEC to have purchased more reserves?

MR. HEDLUND: I object to that. I think that is an improper characterization of this witness' testimony. I believe you know how to ask a straight question.

BY MR. SIMS:

Q Is it your testimony that it is possible that United Electric was not in a position to buy more coal reserves?

A That I couldn't answer.

Q Can you tell us specifically what opportunities UEC had to purchase more coal reserves in the State of Illinois but did not do so?

A In what period?

Q From 1937 to the present time.

A Perhaps in the North Canton Field we were remiss.

Q During what period?

A From 1949 up to the sixties.

Q When in the sixties?

[408] MR. HEDLUND: I believe the witness said "up to."

MR. SIMS: He said "the sixties."

BY THE WITNESS:

A Until the various times we picked up acreages in the North Canton Field and along about that time.

BY MR. SIMS:

Q Was that in 1964 and 1965?

A Roughly those were probably the years.

Q What conversations did you have with anyone at UEC about picking up acreage in the North Canton Field during this period?

MR. HEDLUND: I am a little unclear as to which period you are referring to.

MR. SIMS: From 1948 until up in the sixties, to 1965.

THE WITNESS: '49, I believe I said, didn't I?
MR. CUSACK: Yes, sir, that is correct.
MR. SIMS: 1949.

BY THE WITNESS:

A I can't remember any specific conversation, but there were conversations, I am sure, many [409] times.

BY MR. SIMS:

Q With whom?
A With my superior.
Q Who would that have been during this period?
MR. HEDLUND: I believe he has already testified as to who his superiors were during this period.

BY MR. SIMS:

Q Mr. Latimer, would that have been Mr. Hepburn?
A During part of it.
Q Who else?
A Mr. Reid?
Q Mr. Inman?
A Reid, Pinckney, Shorthouse, Hepburn.
Q Nugent?
A Mr. Nugent wasn't in the picture as far as I was concerned.
Q Did you urge any of these men to pick up coal reserves in this North Canton area?
A I probably did.
Q When was the first time that you [410] recommended that the North Canton Field be picked up?
A In its entirety?
Q At any point, at any portion.
A I think about 1948. I am not exactly certain as to the date.
Q Did you write a memorandum to that effect at that time?
A I doubt it.
Q When was the first time that you recommended in writing that it be picked up?
MR. HEDLUND: If you recall.
MR. SIMS: If you recall.

BY THE WITNESS:

A I don't recall.

BY MR. SIMS:

Q When was the last time that you recommended that options be taken up in the North Canton Field?
A I don't recall.
Q Would it have been 1965?
A I don't recall.
Q Would it have been in the last few years?
A Your idea of "few" and mine might be [411]different.
Q In the last three years?
A I can't recall.
Q Would it be in the last five years?
A Probably.
Q Was your recommendation acted upon?
A At times.
Q At times was your recommendation not acted upon?
A Perhaps.
Q Do you know, Mr. Latimer?
A Within the last five years?
Q Yes, sir.
A I can't remember.
Q Other than the North Canton Field, were there other areas that you thought UEC was remiss in not acquiring?
A At one time we were remiss at Buckheart.
Q In what area was this?
A The northern portion of the field.
Q This area was later acquired, was it not?
A Yes.
Q What other areas did you feel UEC was remiss in not picking up?
[412] A In Illinois?
Q Yes, sir.
A Perhaps we were remiss in the Salt Fork Field.
Q Would you explain your answer?
A While it didn't look attractive at the time, it might have deserved more consideration.

Q Did you recommend that it should be taken up?
A At that time?
Q Yes.
A No, I did not.
Q Did you at that time recommend against taking up the field?
A Beg pardon?
Q Did you at that time recommend against taking up that field?
A I don't think I made the decision.
Q When was that, Mr. Latimer?
A I would think around '58 or '59, possibly a little sooner.
Q Would you now recommend taking up options in the Salt Fork Field if it was available?
[413] A I think I would.
Q Is it available?
A I know part of it is controlled by another coal company.
Q Is enough of it available to be worthwhile going back in?
A I don't know.
Q Have you any idea?
A I doubt it.
Q Did Ayrshire pick up this property?
A They were the other coal company I mentioned.
Q Did they pick up this property?
A According to the plat book they owned some property in the field.
Q When did they pick it up, Mr. Latimer?
A I don't know.
Q Was it since 1960?
A I don't know. I beg your pardon. Did you say since 1960?
Q Yes.
A Yes.
Q Was it since 1962?
A I don't know.
[414] Q Other than the areas you have mentioned, are there any other areas in Illinois that you think United Electric was remiss in not acquiring?

A While I was with the company?
Q Yes, sir, from 1937 on.
A We overlooked the Vermont Field, the Sun Spot Field of Ayrshire.
Q What do you mean, you overlooked it?
A We didn't realize it was there.
Q When was this?
A When we overlooked it?
Q Yes, sir.
A During the forties and fifties.
Q Would you blame anybody in specific for overlooking this field?
A Me.
Q Are there any other areas that you would say UEC was remiss in not picking up?
A Looking back, the company might have been remiss in not acquiring at least some key holdings in part of the present River King Field of Peabody Coal Company.
Q When was this?
A I doubt if they had the money. That [415] would have been 1937 to, perhaps, '41.
Q Was United Electric in pretty bad financial condition at that time?
A They certainly weren't in the best of health.
Q Are there any other areas that you felt United Electric was remiss in not taking up in Illinois?
A This all takes a little thinking. I am sorry.
MR. SIMS: Take your time, Mr. Latimer.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

MR. SIMS: Would it help if you could see Nugent Deposition Exhibit 38?
THE WITNESS: I don't think so.

BY THE WITNESS:

A In Illinois I can't think of others without referring to all the maps and files.

BY MR. SIMS:

Q None others come to mind at the moment, is that correct, Mr. Latimer?
A Many years before that, in Illinois.

[416] Q Before what?
A Before '37, but not since.
Q What about in areas other than in Illinois?
A I think we erred in not prosecuting our options on the Gibraltar and Paradise Coal Fields in Muhlenberg County, Kentucky.
Q When was this property optioned?
A I would think 1946.
Q Are there any others?
A We had no option on the Key Coal Company properties—not Key, pardon me—Peabody Coal Company properties in the area bordering Green River.
Q Kentucky?
A Kentucky, in the western part of Ohio County.
Q When was this that you felt UEC should have gone into this territory?
A In the forties. We did go into it. I believe we did a little drilling in the field.
Q Did you recommend that the field be taken up?
A I don't remember. I don't think I would have made any recommendation.
[417] Q Did you recommend that the Gibraltar property be taken up?
A I don't think any recommendation—can I have that question again?
Q Did you recommend that the Gibraltar property be taken up?
A We had these properties under option.
Q Well, exercise the options?
A We weren't ready to exercise the options when we dropped them. We hadn't finishd our drilling.
Q Did you recommend that they be dropped?
A No.
Q Who did?
A I don't know.
Q Other than the properties you have mentioned outside of Illinois, are there any other properties that UEC was remiss in not having picked up?
A Since I have been with the company?
Q Yes, sir.
A You are speaking of just in Kentucky?

Q Anywhere.

A Some of us thought it was a mistake to [418] give up the field we had under option at New Lexington, Ohio.

Q Is that the Sunny Hill Coal Mine?

A It became the Sunny Hill Mine.

Q Did you think it was a mistake?

A Personally?

Q Yes, sir.

A I think so.

Q Did you recommend that it be taken up at the time it was dropped?

A I don't think it was up to me to recommend that.

Q Did you feel that it should have been taken up at the time?

A Yes.

Q Are there any others?

A I think we were remiss in not getting into the west sooner.

Q What particular states are you referring to, Mr. Latimer?

A I am referring to the states of Wyoming, Colorado, New Mexico, Utah.

Q Why do you think they should have gone into the west sooner?

[419] A There would have been little competition.

Q Is there substantial competition in the west now?

A Yes, in parts of it.

Q Did you recommend that United Electric go into the west at an earlier date?

A I recommended it to my superior. That's the end of that answer.

Q Who was your superior?

A At that time, H. A. Reid.

Q When was this?

A It would have been prior to '53.

Q Do you know what he told you concerning this?

A He told me he wanted to, but I guess we would not do it.

Q Did he give you any reason?

A No.

Q Mr. Latimer, what, in your opinion, is the future of western coal?

A Well, I think it's pretty much publicly known that several of the oil companies have bought tremendous holdings of land or of coal for [420] the purpose of gasification and/or liquidation into a synthetic crude oil, land that they paid very substantial bonuses for leasing, could have been controlled for very small amounts of money. That applies to Wyoming and New Mexico and perhaps to a lesser extent in Colorado.

• • • •

[428] BY MR. SIMS:

Q Mr. Latimer, do you feel that the Industry Field will ever be mined?

A That decision would never be up to me.

Q Do you have an opinion of it?

A Under present conditions, I doubt it will be mined.

Q Ever?

A Ever is a long time.

Q What are the present conditions that you refer to?

A It's a small field, isolated, high cost, and I don't know whether or not the coal can be sold.

Q Do you think you were wrong in recommending that UEC go into this field?

A I could have been.

Q Mr. Latimer, what is your opinion of Mr. Kolbe as a coal executive?

MR. HEDLUND: Object.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF JOSEPH J. GALLAGHER TAKEN DECEMBER, 12, 1968

* * * *

JOSEPH J. GALLAGHER

was called as a witness and having duly been sworn by the notary public testified as follows:

DIRECT EXAMINATION

BY MR. FUTTERMAN:

Q Would you state your name, please?
A My name is Joseph J. Gallagher.
Q Where do you reside?
A I reside at 2322 North Burlington Street, Arlington, Virginia.
Q By whom are you currently employed, Mr. Gallagher?
A I am employed by the Bureau of Mines, United States Department of Interior.
Q What is your title?
A My title is Supervisory Industry Economist.
Q What are your duties in that position?
A My duties are the study of and preparation of reports on technical economic matters pertaining to the production, distribution and requirements of bituminous coal and lignite in the United States.
Q How long have you held the position you now hold?
A In the Government this is a question that becomes highly technical. When you say "this position", you mean the [4] position I just described?

* * * *

[99] Q Are you familiar with the fact that the Fulton- [100] Peoria freight rate district generally encompasses mines located in the Fulton-Peoria area?
A I have.

Q You testified previously, Mr. Gallagher, to the fact that to your knowledge—

A I have testified to nothing in specific areas of Peoria, Illinois.

MR. FUTTERMAN: The record will show what he testified to, counsel.

MR. KEMPF: All right. Strike my question, I will start again.

BY MR. KEMPF:

Q Coal is a freight intensive commodity isn't it, Mr. Gallagher?

A Very much so.

Q And it is more than 200 miles from southern Illinois to the Fulton-Peoria area, isn't it?

A If you say it is, I'll take your word for it.

MR. KEMPF: The counsel for the government stipulates that for the purpose of this examination it is approximately 200 miles or so.

MR. FUTTERMAN: No.

MR. KEMPF: I would ask that—I would ask the record show that there is a scale indicating mileage on the map to which we are referring and that by taking a pencil [101] and measuring 200 miles, placing 200 miles, placing the pencil on the map it indicates that it is more than 200 miles from the southern Illinois area to the Fulton-Peoria area.

* * * *

[103] BY MR. KEMPF:

Q During the course of your testimony at the time you were being examined by counsel for the plaintiff you were asked a number of questions on the basis of your knowledge and experience in the coal industry.

A Yes.

Q I am now going to ask you some questions on the same basis as counsel for the plaintiff asked them. I am asking you on the basis of your knowledge and experience in the coal industry, isn't it a fact, Mr. Gallagher, that anyone with even a minimum amount of knowledge of the coal industry knows there is a significant freight differential between coal mines in Fulton county—

Fulton-Peoria area and coal mines in the southern Illinois area when shipped to the Fulton-Peoria area?

MR. FUTTERMAN: I think the appropriate freight rate schedules will show what the differences, counsel.

THE WITNESS: Certainly it is, we know that.

BY MR. KEMPF:

Q Isn't it also a fact, Mr. Gallagher, based on your knowledge and experience again within the coal industry, that anyone with the minimum amount of knowledge or experience in the coal industry knows that because of the differential there are many customers within the Fulton-Peoria area who cannot be sold coal from southern Illinois on a competitive [104] basis with coal mined in the Fulton-Peoria area?

MR. FUTTERMAN: I object. What do you mean by the word "cannot". You mean ever? Is it impossible?

MR. KEMPF: That's precisely what I mean.

MR. FUTTERMAN: Thank you.

THE WITNESS: That is true. That is true normally, yes.

MR. KEMPF: I have no further questions.

THE WITNESS: I would also say that in addition to being true, sir, this is a point within the confines of a political subdivision known as the state of Illinois that we, the Bureau of Mines, are not referring to specifically, partially or otherwise. We are merely referring with the limitation to the state of Illinois and no part thereof with any piece or fraction thereof.

BY MR. KEMPF:

Q What you are saying then, you report that you are testifying to concerning this morning does not deal with specific markets within Illinois but rather only with the geographical boundaries established in 1818?

A On the state of Illinois.

MR. KEMPF: Thank you very much.

MR. CUSACK: It's not a geographical boundary there, political boundary.

MR. KEMPF: Political boundary, I'm sorry counsel.

* * * *

[3]

EXCERPT FROM DEPOSITION OF WILLIAM L. KURTZ, TAKEN DECEMBER 12, 1968

* * * *

PROCEEDINGS

Whereupon,

WILLIAM L. KURTZ

was called as a witness by Counsel for the Plaintiff, and, having first been duly sworn by the notary public, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. SIMS:

Q Would you state your name for the record, please?
A William Louis Kurtz.
Q Where do you reside Mr. Kurtz?
A 6435 Lee Highway, Arlington, Virginia.
Q Are you testifying under subpoena?
A Yes, I am.
Q How are you presently employed?
A I am manager of the Division of Economics and Statistics of the National Coal Association.
Q What is the National Coal Association?
A The National Coal Association is a trade association which represents primarily bituminous coal producers.
Q Do you have any idea what per cent of the coal producers are members of the National Coal Association?
A I do not know.
Q Is General Electric—strike that. Is United Electric Coal Company a member of the National Coal Association?
[4] A Yes.
Q Is Freeman Coal Company a member?
A Yes.
Q Is Frank Nugent an active director of the National Coal Association Board of Directors?

A Yes.

Q What is the function of the Division of Economics and Statistics?

A Our function is to gather, compile and disseminate economics and statistics data to serve our membership, the staff of NCA, and outside requests that come in from various parties.

Q Any particular class of statistics?

A We deal primarily in the fuel statistics area and related subjects to that.

Q What are your responsibilities as manager?

A To supervise the gathering, compilation and dissemination of the information I just described.

Q Who is your immediate superior?

A Thomas Howarth.

Q What is his title?

A Secretary Treasurer of the Association.

Q What size staff do you supervise?

A I have one economist, one statistical clerk, a statistical typist and a secretary.

[5] Q How long have you held the position of manager of the Division of Economics and Statistics?

A About three years.

Q How were you employed prior to occupying that position?

A I was still employed by the National Coal Association. Just prior to that I was Assistant Director of the Department of Economics and Transportation.

Q How long have you been employed by the National Coal Association?

A Since September, 1953.

Q Does the National Coal Association publish the Steam Electric Plant Factors Report?

A Yes.

Q Are you involved in any way in publication of this report?

A Yes. My primary responsibility is to produce the report.

Q How often is this report prepared?

A Once a year.

Q How many issues of the report have been published by the National Coal Association?

A There have been 18 editions.

Q What is the purpose of publishing this report?

A To disseminate information on the current fuel [6] consumption, generation and cost experience of the electric utilities.

* * * *

[4]

EXCERPTS FROM DEPOSITION OF MARTHA TERLEKE, TAKEN DECEMBER 16, 1968

* * * *

MR. HEDLUND: I think that the rules do provide for our receiving a copy of the subpoena. If you have not done so, would you, please?

MR. EISEN: Surely.

MR. KEMPF: I think the record should also show whether or not Miss Terleke is represented by counsel in these proceedings.

MR. BEEBE: Let the record show that Hamilton K. Beebe is present, representing the witness.

MR. EISEN: I understand that you are counsel for the Mid-West Coal Producers Association?

MR. BEEBE: That is correct.

MR. EISEN: Or Institute?

MR. BEEBE: The Mid-West Coal Producers Institute, Inc.

MR. EISEN: Thank you.

BY MR. EISEN:

Q Miss Terleke, you are employed by the Mid-West Coal Producers Institute, Inc.?

A Yes.

[5] Q What is your position?

A Corporate Secretary and Assistant Treasurer.

Q How long have you held that position?

A Since the company became activated, on October 11, 1958.

Q You mean, the Institute?

A Yes.

Q Since the Institute has been formed?

A Yes.

Q Do you hold any other positions?

A You mean with the Institute?

Q With the Institute or any other organizations.

A I am Assistant Secretary-Assistant Treasurer of the Illinois Coal Operators Association.

Q Did you have any previous experience in the coal industry?

A Well, I worked for some of the associations that became part of the Mid-West Coal Producers Institute, for about fourteen years—eleven years before Mid-West came into existence.

* * * *

[6] MR. EISEN: I will now ask our Court [7] Reporter, Mr. Youker, to mark as Terleke Deposition Exhibit No. 1, a one-page document entitled, "Certificate of Tonnage Produced", and ask that you look at that exhibit after it has been so marked.

(The document was thereupon marked Terleke Deposition Exhibit 1 for identification, 12-16-68.)
(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY THE WITNESS:

A I have read it.

BY MR. EISEN:

Q Will you tell us what this document is?
A That is one of our Certificates of Tonnage Produced report forms. It is a form that we mail to the member companies the last day of the month.

It has become an established fact over these years that they fill this out with the month's tonnage just preceding, and give us the days worked, the name of the mine, whether it is an underground or strip mine and the total production, and it is [8] signed by someone with a position of some standing.

Usually it is signed by someone in the Accounting Department, the Controller, sometimes the Treasurer or the Chief Accountant. It is signed and returned to us.

We use this for various purposes after we get it.

MR. EISEN: I am now going to ask Mr. Youker, our Court Reporter, to mark as Terleke Deposition Exhibits 2 through 11, ten three-page documents, each of which is entitled, "Report of Mine Performance—Month of . . .", and in the case of Terleke Deposition Exhibit No. 2 for identification, "December 1957 and 1958, and Accumulation—January through December, 1957 and 1958

for Illinois, Indiana and Western Kentucky, by Districts."

I am now going to ask the Reporter to mark the 1957-1958 report as Terleke Deposition Exhibit No. 2 for identification, the 1958-1959 report as Terleke Deposition Exhibit 3 for identification, the 1959-1960 report as Terleke Deposition Exhibit 4 for [9] identification, the 1960-1961 report as Terleke Deposition Exhibit 5 for identification, the 1961-1962 report as Terleke Deposition Exhibit 6 for identification, the 1962-1963 report as Terleke Deposition Exhibit 7 for identification, the 1963-1964 report as Terleke Deposition Exhibit 8 for identification, the 1964-1965 report as Terleke Deposition Exhibit 9 for identification, the 1965-1966 report as Terleke Deposition Exhibit 10 for identification and the 1966-1967 report as Terleke Deposition Exhibit 11 for identification, and after they have been marked, I will ask the Reporter to hand the documents to the witness.

I assume counsel have copies of these, so rather than go through and mark these one by one with the Reporter, which would have been more cumbersome, I have identified these en masse. Have you been able to mark these down as I have so identified them?

MR. KEMPF: We have.

(The documents were thereupon marked Terleke Deposition [10] Exhibits 2 through 11, inclusive for identification, 12-16-68.)

BY MR. EISEN:

Q Miss Terleke, now that you have these exhibits in your hands, could you tell us what responsibilities, if any, you have in preparing these documents?

A Well, these documents are prepared under my supervision. We get, whenever possible, the figures from this green sheet (indicating), the production sheet, which is returned to us by the member companies.

Q You were referring to Terleke Deposition Exhibit 1—

A That is right.

Q —when you referred to the green sheet?

A Yes. That is placed on a sheet in pencil form, and after we have received all of the green sheets and have

all of the figures except from those people listed on the later ones, who are no longer members of Mid-West, the figures are totaled and then the girl cuts a stencil on them and we check the stencil to make sure it is correct, and then we mail them to such people as we [11] have been requested to mail those reports to.

Q When you get the report, do you look at it first before you give it to her?

A Yes.

Q By "report", I mean the form.

A This form (indicating).

Q Yes.

A Oh, yes. I check the form. I get all of the forms. I check them to see whether there is anything that looks a little bit unusual, such as a new mine, or a mine might be omitted, perhaps, and then I check to find out whether it is no longer in operation, if they have not so specifically stated, which they most often do, and then I give it to the girl.

She again, if she finds anything that is a little doubtful in her mind, will question me on it, and if it is anything that requires a telephone call to the person who prepared or who signed the report, I contact them.

Q Do you proof read the figures—

A Yes.

Q —on the stencil?

A Yes.

[12] Q How do you do that? I mean, do you proof read them against the original report, or against the—

A Against the one in pencil form that we have prepared.

Q Who authorizes you, or who has authorized you to do this work?

A Well, this was requested by the members when we started. It was suggested that such a report be prepared and mailed.

Q By "the members", do you mean that there was some action taken by the board of directors of the Institute, or something of that sort?

A I cannot answer that. All I know is that that was back in 1957 or 1958, before Mid-West was activated, I

believe that was in about February, and we had a meeting at that time but I was not an officer of the corporation.

Mr. Christiansen was the Secretary, and he was the one who said they suggested it, and in his letter that he mailed out requesting that tonnages be sent in to the office every month, he stated that the action was taken at this meeting. It was suggested that such a report be prepared.

[13] Q Have you been doing this ever since that time?

A Yes.

Q Ever since you have been with Mid-West?

A Ever since the report was sent out, yes. That was the 1957-1958 report.

Q Do you send the form to any companies other than members of the Institute?

A No.

Q I believe you said that the report forms, the blank report forms, go out once a month?

A Yes. Some of the companies get enough for a year's supply, but in most instances one goes out every month.

Q Does the Institute have any members who are not located in the Mining Districts referred to in the monthly reports?

A (Shaking head "No.")

Q No?

A No.

MR. KEMPF: For the purposes of the record, counsel, what districts are those to which you are referring?

[14] MR. EISEN: The districts referred to in each report. I am referring now to Terleke Deposition Exhibit 2.

MR. KEMPF: Are you referring to the far left-hand column?

MR. EISEN: Well, let me ask the witness:

BY MR. EISEN:

Q With reference to Mining Districts 9, 10 and 11, are you familiar with those terms?

A Well, if they mean Illinois, Indiana and Western Kentucky, those are the only places we have members.

MR. EISEN: That is what my question was.

BY MR. EISEN:

Q Now, do you report any statistics in these reports which represent the production of companies who are not members?

A Yes. In Western Kentucky we have Pittsburgh & Midway and West Kentucky Coal Company. They at one time were members, but since they have dropped their membership, they still send in their tonnage either by phone or by mail, and want them included in the report.

[15] Q How do you get those figures?

A From West Kentucky Coal Company, they send in a sheet of paper with their tonnages on. Pittsburgh & Midway either phone them in, or I contact them and get them over the phone. It's a phone contact.

Q Referring again to Terleke Deposition Exhibits 2 through 11, could you tell us what these are in terms of what is represented on the sheets themselves?

A I do not understand what you mean. It is a monthly report. This is the December report that you have here in each instance.

They give the tonnages by months for the two years, the current year and the preceding year, and the accumulated figure for the same years, whatever years the report has on it, of the production of the companies' mines listed on the left-hand side.

Q So that this is the report for December but it also contains the annual figures, as you have indicated?

A Yes.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF CHARLES W. STADELL, TAKEN DECEMBER 16, 1968

* * * *

Q Mr. Stadell, could you please give us your educational background?

[4] A I had two years of college and am a graduate of John Marshall Law School. I have been admitted to the bar in Illinois and Indiana and before the United States Supreme Court.

Q Could you give us some of your general legal background, Mr. Stadell?

A Well, I have been employed in the coal industry since 1934. I was employed in August, 1934, by the Illinois Coal Traffic Bureau, which was an association composed primarily of companies operating coal mines in the Southern Illinois District, the DuQuoin District and the Belleville District, and I represented them in many cases before the Interstate Commerce Commission and the Federal Power Commission, involving the extension and expansion of natural gas pipelines before various state regulatory agencies.

Q By "districts", Mr. Stadell, you mean freight rate districts?

A That is correct.

Q How long were you with this Bureau, sir?

A Until October 1, 1958, when I came with the Mid-West Coal Producers Institute as commerce attorney.

[5] Q What other positions did you hold with the Mid-West Coal Producers Institute?

A That is the only position until July 1, 1965, when I was made Executive Vice-President, which is the position I have held since that time.

Q Mr. Stadell, could you tell us, please, when the Mid-West Coal Producers Institute was formed?

A It was in the formative stage, as Miss Terleke testified, in 1957, and actually began functioning and set up its offices here on October 1st, 1958.

Q Was the Mid-West Coal Producers Institute a successor to any other coal operators' association?

A There was a number of district or regional coal associations, among which was the Illinois Coal Traffic Bureau, the Northern Illinois Coal Trade Association, with which Mr. Christiansen, mentioned by Miss Terleke, was associated, the Northern Indiana Coal Traffic Association and the Kentucky Coal Traffic Association or Kentucky Coal Agency, which had as members the West Kentucky coal pro- [6] ducers.

They in effect were merged into the Mid-West Coal Producers Institute, when it began functioning on October 1st, 1958.

Q All those associations?

A That is right.

Q Mr. Stadell, would you please tell us what the functions of the Mid-West Coal Producers Institute are?

A Well, it is to carry on all of the normal activities of a trade association.

We have various activities relating to land reclamation, water pollution, air pollution, we handle transportation matters for the member companies, we represent them in cases involving freight rates from their mines or from mines in competitive districts to various destination areas.

We have committees such as an Air Pollution Committee and Technical Advisory Committee on Air Pollution Control, which is composed of the combustion engineers of member companies that meets once a month or more to deal with regulations or ordinances proposed throughout the territory in which Mid-West coal may be marketed, that may affect the marketing of that coal.

[7] Q Do you also, Mr. Stadell, send to your member companies statistical information with regard to production?

A Yes, such as the information that was contained in the exhibits that Miss Terleke was questioned in connection with.

Q Mr. Stadell, could you please tell us who the present members of the Mid-West Coal Producers Institute are?

A Peabody Coal Company—I will try to get them all here.

Peabody Coal Company, Freeman Coal Mining Corporation, The United Electric Coal Companies, Ayrshire Collieries Corporation, Enos Coal Company, Old Ben Coal Corporation, Sahara Coal Company, Bell & Zoller Coal Company, Kirkpatrick Coal Company, Southwestern Illinois Coal Corporation, Pioneer Coal Company, Sherwood-Templeton Coal Company, Pioneer, which has a small mine in Illinois, Truax-Traer Division of Consolidation Coal Company. Did I mention Old Ben Coal Corporation?

Q Yes.

A I think I did mention it. I believe that is all.

* * * *

[10] For example, to Beloit, Wisconsin or [11] Rockford, Illinois, all the mines in the Southern Illinois District were given the same freight rate by rail to that destination, so that when a new mine comes into operation, generally the first thing that is done is for the company to approach the railroads that are serving the mine and ask to be placed in a district, if it is within the boundaries of that district, for freight rate purposes.

Q Thank you, Mr. Stadell.

Where are the mines of the Members of the Midwest Coal Producers Institute located?

A They are located within the districts shown on the exhibits Miss Terleke was questioned about.

Q In what states are those mines located, sir?

A Illinois, Indiana and the western portion of Kentucky that is generally referred to as the Western Kentucky Group.

Q Can you tell us, Mr. Stadell, if these areas have any numerical name or are assigned any numerical designation as a mining district?

A Well, they are as shown on the production statement that Miss Terleke was questioned about. For example, they are the Fulton County District, [12] the Central Illinois District, the Danville, Illinois District, the Belleville, Illinois District, the Southern Illinois District, and then there are four districts of Indiana and Western Kentucky.

Q Other than freight rate districts as set out in the report, can you tell us what mining districts are included in Illinois? Is Illinois a particular Mining District?

A Well, it is generally referred to as District No. 10, yes, West Kentucky is No. 9 and Indiana is No. 11.

Q Are all the mines in Indiana, Western Kentucky and Illinois located in Mining Districts 9, 10 and 11?

A That is correct.

Q Do some of your members have mines outside of Mining Districts 9, 10 and 11?

A Yes. Some of them do. Some of them have mines in—Peabody has a mine in Ohio, and I think they have a mine in East Kentucky, but the production of those mines is not included in the Mid-West. We have nothing to do with it.

Q I see.

[13] A Some of them have mines in Colorado.

Q Mr. Stadell, based on your knowledge and experience in the industry, is there a particular name given for the coal mines located within Mining Districts 9, 10 and 11?

A Well, again the Interstate Commerce Commission for many years has generally referred to that area as the Midwestern Coal District, or the Midwestern Coal Producing Area, and the Midwestern mines.

Q Does this constitute an integrated coal field, in your opinion?

MR. KEMPF: I object to that. What is an integrated coal field? I think it would be helpful to the witness if you defined it.

BY MR. CUSACK:

Q Does this constitute a coal field, in your opinion, Mining Districts 9, 10 and 11?

A It is generally referred to, as I say, as the Midwestern coal field.

Q Mr. Stadell, with reference to mines located in Missouri and in Arkansas, what coal field, if any, are they located in?

A Mines in Missouri, Kansas, Arkansas and [14]

Oklahoma are generally referred to as the Southwestern coal field.

* * * *

[30] Q This map shows the distribution of coal produced in Illinois, Indiana and Western Kentucky; [31] that is correct, is it not, sir?

A Yes.

Q Directing your attention, sir, to this map, could you tell us the areas in the United States where the total coal consumed is produced in Mining Districts 9, 10 and 11?

MR. HEDLUND: I am a little confused by your question, counsel. Will you read the question, please, Mr. Youker?

Q (Read by the Reporter.)

BY MR. CUSACK:

Q Do you understand the question, Mr. Stadwell?

A I do not believe I do. I do not believe I do. What you are asking, in effect, is which of these areas consumes only coal produced by the Midwestern mines?

Q Not "only", but where does it predominate? For example, in what areas of the country would 75 per cent, as a figure, of the coal consumed be coal which is produced in Mining District 9, 10 and 11?

A Well, with respect to Illinois, Indiana and Eastern Iowa, possibly 65 to 70 per cent of the coal consumed in Minnesota and Wisconsin would be produced by Midwestern mines.

[32] Q What about Missouri? Do you know whether any Midwestern coal goes into Missouri?

A Yes. There is Midwestern coal that goes in there from Southern Illinois and the Belleville-DuQuoin, Illinois Districts.

I do not believe there is very much—there is no Indiana coal that goes into Missouri and not too much Western Kentucky coal.

Q What portion of Missouri would this coal go into?

A Approximately the southeastern portion, because in the western portion or the northern portion, it is coal primarily produced by Missouri mines.

Q What about Kentucky, Mr. Stadell? Does any coal produced in Mining Districts 9, 10 and 11 go into Kentucky?

A Virtually no Indiana coal and very little Illinois coal, except for a TVA plant at Childs, Kentucky; it would be predominantly Western Kentucky and eastern coal, Appalachian coal, in Kentucky.

Q Do you know whether much eastern coal goes into Western Kentucky?

[33] A I do not believe so. I do not believe very much eastern coal goes into Western Kentucky.

Q What about Tennessee, Mr. Stadell? Does any coal produced in Mining Districts 9, 10 and 11 end up in Tennessee?

A Quite a lot of the Western Kentucky coal would move to the TVA plants and some Illinois coal.

Q Into what portions of Tennessee, if any, would this coal move?

A Well, I think it would be primarily the western portion.

Q Would you say with respect to the total coal consumed in western Tennessee that at least 75 per cent of it was produced in Western Kentucky and in Illinois?

A I would hesitate to make that assumption without having an opportunity to check the figures.

Q Do you think it would be at least over 50 per cent?

A I would imagine it would be about that.

Q Mr. Stadell, do you know whether any coal produced in Indiana moves into the extreme eastern portion of Indiana?

A Some does, yes.

[34] Q What would be the area in Minnesota where coal produced in Mining Districts 9, 10 and all has the greatest share of the market?

A It would be along the Mississippi River. It moves by rail-barge up the Mississippi River.

Q Would that be in southeastern Minnesota, then?

A That would be up around the St. Paul-Minneapolis area. There is a big electric utility plant at Black Dog, Minnesota, that receives its coal by barge.

Q Is it a fair statement to say, Mr. Stadell, that the coal consumed in the eastern half of Iowa is produced in Mining Districts 9, 10 and 11?

A Yes. I would think that most of it would be from Illinois and Western Kentucky. There may be some Indiana coal out there.

Q You know, don't you, that some Indiana coal moves from Indiana by rail into northern Illinois?

A Yes.

* * * *

[36] MR. CUSACK: I am not going to even dignify that objection by a response. Mr. Stadell has testified that he has spent thirty-four years in the coal industry in regard to freight traffic matters. Apparently you do not recall that.

MR. KEMPF: I am sorry, counsel, but I do not consider that as having established a foundation to answer a line of inquiry such as you have just begun. I continue my objection.

BY MR. CUSACK:

Q Mr. Stadell, would you tell us, please, the freight rate districts which, in your opinion, and based on your knowledge and experience, can or do or have served the Chicago Metropolitan Area?

A I think most of the Midwestern Districts shown on the production statement that Miss Terleke was questioned about ship or have shipped into the Chicago area.

Q Thank you.

A Some of them ship, of course, by rail, some of them by barge and some rail-barge.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF HAROLD K. PEDERSEN, TAKEN DECEMBER 18, 1968

* * * *

HAROLD K. PEDERSEN,

called as a witness by the Plaintiff herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.
A Harold K. Pedersen.
Q What is your home address?
A 14 Darbrook Road, Westport, Connecticut.
Q What is your present position?
A Treasurer of General Dynamics Corporation.
Q In New York City?
A New York City.
Q What is your educational background, Mr. Pedersen?
A Graduate of St. Johns University, Bachelor of Business Administration.

* * * *

[74] Q At the Continental, Chase, American National, Commercial National, Providence State Bank, totaling $4,670,000, is that correct sir?
[75] A That's correct.
MR. HEDLUND: $4,675,000.
MR. CUSACK: $4,675,000, yes.

BY MR. CUSACK:

Q There was cash of $1,295,000, is that correct, sir?
A That's correct.
Q For total cash of $5,970,000, is that correct?
A That's correct.
MR. HEDLUNG: You mean total cash and C. of D.'s?
MR. CUSACK: Yes.

BY MR. CUSACK:

Q Of $5,970,000?
A That is correct.
Q Do you know why, Mr. Pedersen, United Electric was accumulating cash in 1964, 1965 and 1966?
MR. HEDLUND: I think you had better first ask him whether or not they were before you ask him why, if he knows.

BY MR. CUSACK:

Q You know, do you not, Mr. Pedersen, [76] that United Electric was accumulating cash in 1964, 1965, 1966 and 1967?
A I know that during this period they were accumulating cash in excess of their normal operating requirements, yes.
Q And investing this cash in C. of D.'s?
A Investing it in certificates of deposit.
Q Do you know why United Electric was accumulating this cash?
A For what purpose?
Q Yes.
A No.
Q Is it not a fact, Mr. Pedersen, that the management of General Dynamics instructed United Electric to accumulate cash in 1964, 1965 and 1966?
A I don't know that to be a fact.
Q Do you deny that it is a fact?
A I don't know it to be a fact.
Q Have you ever heard, Mr. Pedersen, that United Electric was instructed by General Dynamics to accumulate cash in 1964, 1965 and 1966?
A No, I have not heard such a statement.
Q It is a fact, however, is it not, that [77] after United Electric was acquired by General Dynamics, its accumulated cash was transferred by way of a dividend from United Electric to General Dynamics?
A Cash at that point in time was declared as a dividend, yes.
Q Six million dollars?

A Correct.

Q Mr. Pedersen, I show you Nugent Deposition Exhibit 31, a 1965 annual report of United Electric, and direct your attention to Page 8 which sets forth the assets of United Electric as of December 31, 1964 and 1965.

I show you there, sir, that the cash entry here states that United Electric had cash as of December 31, 1965 of $1,766,245, is that correct, sir?

A That's correct.

Q United Electric had bank certificates of deposit of $3,675,000, is that correct, sir?

A That's correct.

* * * *

[95] Q Is it a fact, sir, that on or about December 22nd, 1966, United Electric loaned General Dynamics one million dollars?

MR. HEDLUND: May I have that question back, please?

MR. CUSACK: I would be happy to state it again.

MR. HEDLUND: Either way.

BY THE WITNESS:

A Did you say September 22nd?

BY MR. CUSACK:

Q I meant to say on or about September 22nd, 1966, is it not a fact that United Electric loaned General Dynamics one million dollars?

A That's correct.

Q Is it not a fact, Mr. Pedersen, that on or about October 31, 1966, United Electric loaned General Dynamics one million dollars?

A That's correct.

Q Do you recall what interest these notes would carry?

A I believe they were six percent notes.

Q Was that the prime or going rate at that [96] time?

A It was either prime or perhaps a quarter over.

MR. HEDLUND: I am sorry. May I have that question and answer back, please?

Did you ask him if that was the prime rate at the present time or at that time?

MR. CUSACK: At that time.

BY THE WITNESS:

A At those times.

BY MR. CUSACK:

Q Can you tell us, Mr. Pedersen, why General Dynamics borrowed two million dollars from United Electric in September and October of 1966?

A General Dynamics was borrowing from the banks at that time and since United Electric Coal had excess cash at that point, it was desirable to borrow from the subsidiary.

Q You know, do you not, that on September 22nd, 1966, United Electric was not a subsidiary of General Dynamics?

A Yes, it was, but it was not a wholly owned subsidiary.

• • • •

[101] MR. CUSACK: Would you please mark as [102] Pedersen Deposition Exhibit 12 a letter from Mr. Alderson to Mr. Culverwell dated May 17, 1967.

(The document was thereupon marked Plaintiff's Pederson Deposition Exhibit 12 for identification, 12-18-68).

MR. CUSACK: Thank you.

Counsel, does the standing stipulation apply to Pedersen Deposition Exhibits 7 through 12, inclusive?

MR. HEDLUND: It does.

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q Mr. Pedersen, in the fall of 1966 and in the winter and spring of 1967, did you direct United Electric to transfer funds from the accounts of United Electric to

the Chase Manhattan Bank to pay for the stock involved in the General Dynamics tender?

MR. HEDLUND: May I have that question back, please.

Q (Read by the reporter.)

MR. HEDLUND: I think that is a rather [103] confusing question, Mr. Cusack. I am not certain that I quite understand it. I think you are asking two questions at the same time.

Also, I think the word "fall" is somewhat ambiguous in the context of the exhibits we just stipulated to and which you have marked.

MR. CUSACK: All right. We will go over the exhibits one by one.

BY MR. CUSACK:

Q Mr. Pedersen, I now hand you what has been marked as Pedersen Deposition Exhibit 7, which is a letter from Mr. Alderson to Mr. Culverwell.

I note, sir, that this letter states:

> "As per your request through Mr. H. K. Pedersen's office in New York, we are enclosing herewith our check in the amount of $250,000.00 to be used for reimbursement of United Electric common stock to stockholders in connection with General Dynamics tender dated October 5, 1966."

[104] Is that what it says, Mr. Pedersen?

A That's correct.

Q Mr. Pedersen, on or about November 28th, 1966, did you direct United Electric to transfer $250,000 from United Electric to the Chase to pay for a portion of the stock tendered by the General Dynamics tender offer for the stock of United Electric?

MR. HEDLUND: May I have that question back, please?

Q (Read by the reporter.)

MR. HEDLUND: That is a hopelessly worded question. If the witness understands what you are getting at, he may answer.

MR. CUSACK: I do not think it is hopelessly worded; I think it is perfectly clear, and I ask the witness to answer it.

BY THE WITNESS:

A Yes, I did direct them to transfer these funds to the Chase for the purchase of common stock.

BY MR. CUSACK:

Q Of United Electric?

A United Electric.

[105] Q By General Dynamics?

A By General Dynamics.

Q Incidentally, this letter from Mr. Alderson to Mr. Culverwell is accurate, is it not?

A That's correct.

Q I direct your attention, sir, to Pedersen Deposition Exhibit 8, which is Mr. Alderson's letter to Mr. Culverwell of January 3, 1967, and I ask you whether or not it is a fact that on or about January 3, 1967, you directed United Electric to transfer $100,000 of the funds of United Electric to the Chase for the payment to common shareholders of United Electric for the General Dynamics tender?

A That is correct.

Q Is that letter, Pedersen Deposition Exhibit 8, accurate, sir?

A Yes.

Q I direct your attention, sir, to Pedersen Deposition Exhibit 9, and I ask you if it is a fact that on or about January 6, 1967, you directed United Electric to transfer $200,000 of its funds to the Chase to pay for the shares [106] tendered in United Electric as a result of the General Dynamics tender?

A Yes.

Q Is this letter, Pedersen Deposition Exhibit 9, accurate, sir?

A No, in the sense that I think the shares were not tendered at the proper date. These were shares that came in later after the tender date. That is the only correction.

Q It was after the expiration of the tender?

A The tender date was November 4, I believe. I'm not sure. But, this is substantially correct.

MR. CUSACK: Will counsel stipulate that the General Dynamics tender was extended beyond November 4?

MR. HEDLUND: I will stipulate that the tender expired prior to November 28, 1966.

BY THE WITNESS:

A (Continuing) It is my recollection that these transfers were to take care of shares that were offered after the tender date.

[107] BY MR. CUSACK:

Q However, they were shares of United Electric?

A That's correct.

Q Tendered to General Dynamics?

A That's correct.

Q Mr. Pedersen, I show you Pedersen Deposition Exhibit 10, Mr. Alderson's letter to Mr. Calverwell dated March 21, 1967, and I ask you, sir, if it is a fact that on or about March 21, 1967, you directed United Electric to transfer $100,000 to the Chase for the payment of United Electric shares tendered to General Dynamics?

A That's correct.

Q Is this letter, Pedersen Deposition Exhibit 10, accurate, sir?

A Yes.

Q I show you, sir, what is Pedersen Deposition Exhibit 11, Mr. Alderson's letter to Mr. Culverwell of April 7, 1967, and I ask you, sir, if it is a fact that on or about April 7, 1967, you directed United Electric to transfer $150,000 of its funds to the Chase for the reimbursement of United Electric shareholders in [108] connection with the General Dynamics tender offer.

A That is correct.

Q Sir, is Pedersen Deposition Exhibit 11 accurate?

A Yes.

Q Mr. Pedersen, I show you what has been marked as Pedersen Deposition Exhibit 12 which is Mr. Alderson's letter to Mr. Culverwell of May 17, 1967, and I ask

you, sir, if it is a fact that on or about May 17, 1967, you directed United Electric to transfer $100,000 of its funds to the Chase to be used for reimbursement of United Electric common stock to the United Electric stockholders in connection with the General Dynamics tender offer dated October 5, 1966.

A That's correct.

Q Mr. Pedersen, is Pedersen Deposition Exhibit 12 accurate?

A Yes.

Q If my addition is correct, Mr. Pedersen, this means that United Electric, from November 28, 1966 to May 17, 1967, transferred $900,000 to the Chase for payment of the United Electric shareholders as a result of the tender offer.

[109] A That is correct.

Q Do you know, Mr. Pedersen, whether there was any more money transferred from United Electric to the Chase for the payment of the United Electric shareholders as a result of the tender offer?

A I am not certain, but I believe there were other transactions.

Q It would be, then, over $900,000, would it not?

A I believe so.

Q Do you know how much more it was?

A No, I don't know offhand.

Q We have records from Mr. Alderson's internal records of United Electric indicating that it was one million dollars. Do you know if it was over a million?

A It was in that approximate area, a million two, a million three.

Q It would not be over a million three?

A I don't believe so.

• • • •

[3]

EXCERPT FROM DEPOSITION OF JOHN P. MAGUIRE, TAKEN DECEMBER 23, 1968

• • • •

JOHN P. MAGUIRE,

called as a witness by the plaintiff herein, having been by me, the said Claude W. Youker, Jr., as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.
A John P. Maguire.
Q What is your home address, Mr. Maguire?
A Merry Meeting Lane, Huntington, New York.
Q What is your present position?
A I am Secretary of General Dynamics Corporation.
Q Are you also Secretary of any subsidiaries of General Dynamics?
A I am Secretary, generally speaking, of all subsidiaries of General Dynamics.

• • • •

[4]

EXCERPTS FROM DEPOSITION OF B.H. SLOANE, TAKEN MARCH 7, 1969

* * * *

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name, sir.

A B. H. Sloane.

Q Would you please state your employment and the position that you hold?

A I am a vice-president of the Aluminum Company of America, in charge of raw materials, refining and smelting.

Q Are you a resident of Pittsburgh, Pennsylvania?

A No; Rosslyn Farms, which is a Carnegie address.

Q Mr. Sloane, would you briefly summarize for me your education and employment experience prior to becoming an employee of Alcoa?

A I am a graduate of the Georgia School of Technology, Class of 1930, in civil engineering. I have been employed by Alcoa since June 15th, 1930.

Q Again very briefly, would you summarize your employment experience with Alcoa from, say, 1930 to 1940?

A From 1930 until 1940 I was employed as a [5] technician, foreman and general foreman in the Alcoa, Tennessee plant.

Q And then from 1940 to 1950, sir?

A Beginning in 1940 I was the aluminum plant superintendent at the Vancouver Works.

In 1942, aluminum plant superintendent in the DPC plant at Troutdale, Oregon. In October of the same year I was the production manager of the DPC plant in Queens, Long Island.

In 1944, Production manager of the DPC plant in Jones Mill, Arkansas.

On January 1, 1945, production manager of the aluminum plant in Vancouver, Washington.

February 1, 1952, Works Manager, Point Comfort plant, in Point Comfort, Texas.

In 1956, operations manager, Point Comfort operations.

1960—you just wanted me to go through 1950, didn't you?

Q From 1956, then to 1960 you were operations manager at Point Comfort?

A Point Comfort Works, yes.

Q Then would you bring us up to date, sir, since 1960?

[6] A 1960, general manager, Smelting Division, in 1965, vice-president in charge of smelting and refining, and in 1966 raw materials was added.

Q Would you please briefly describe the functions of your position as vice-president of smelting, refining and raw materials.

A The vice-president of these divisions is responsible for the production of the raw materials, their refining into usable ores and other products and the smelting of these ores into metal, the production of power for the purpose of smelting and the final casting of metal into ingot forms that are used for either sales or fabrication.

Q To whom do you report directly?

A To the executive vice-president of the Primary and Allied Products Division.

Q What is his name, sir, please?

A J. M. Mitchell.

Q Are you familiar with the coal reserves that are presently controlled by Alcoa?

A Yes.

Q Where are these located?

A The coal reserves are in southern Indiana, near Evansville, Boonville, in Sturgis, Kentucky in [7] Union County and Crittenden County, and in Illinois, near Pinckneyville.

Q Do you recall what county Pinckneyville is in?

A Not offhand. It is on the map here.

Q May I suggest that it is in Perry County.

MR. CUSACK: We will so stipulate.

BY THE WITNESS:

Q It is in Perry County.

BY MR. HEDLUND:

Q Have you now listed all of the coal reserves?
A Coal, yes. You did not ask about lignite.
Q No.
A We have lignite reserves as well.
Q Where are the lignite reserves?
A They are in Milam and Robertson Counties, Texas.
Q Does Alcoa also control any other form of energy which it uses to generate power at its smelting plants?
A Yes; gas and oil reserves in Calhoun, Matagorda and Jackson Counties, Texas.
Q Any other reserves of energy in any other [8] location that the company is presently using as a fuel to generate power?
A We have some isolated reserves of gas and oil in other counties in Texas but they are minor by comparison.
Q Now, Mr. Sloane, with respect to the reserves in southern Indiana, which I will refer to, if I may, as the Warrick reserves, are these strip reserves or deep reserves?
MR. CUSACK: The Government objects to your characterization of those reserves as the Warrick reserves. I believe he testified that they were the Evansville and Boonville reserves. I object to that, unless you want to ask him if they can be referred to in that way.

BY THE WITNESS:

A It is Warrick County.
MR. CUSACK: It is Warrick County?

BY THE WITNESS:

A Yes.
MR. CUSACK: Thank you. I will withdraw my objection.

BY THE WITNESS:

A Those are both strip and deep, strip predominating.

[9] BY MR. HEDLUND:

Q Do you know approximately how many tons of strip reserves are present in the field?

A Approximately 200,000,000 tons.

Q Are these all owned or otherwise controlled by Alcoa?

A Yes.

Q Are these reserves presently being mined?

A Yes.

Q Are they being mined by Alcoa?

A No.

Q Are they being mined by a coal producer?

A They are being mined by a coal producer in a partnership arrangement.

Q Approximately how many tons a year are being mined out of the Warrick County reserves?

A About a million and a half tons per year, at the present rate. It will be stepped up as early as our next generating unit is available to approximately two million tons a year.

Q For what purpose is the coal being mined in Warrick County being used by Alcoa?

A Totally for the generation of electricity by the Alcoa Generating Corporation.

[10] Q Can you tell me approximately the kilowatt output or capacity of the generating station there?

A We have three units of 150 megawatts each.

Q Are you presently utilizing coal in these generating units other than the coal being mined in Warrick County?

A No.

Q With reference to your plant at Warrick, is it proper to refer to that as a smelting facility or is it both smelting and refining?

A No. It is a joint enterprise using both smelting and fabricating facilities and power-generating facilities. In our terminology, it is joint operations.

Q Do these facilities use coal for any purpose other than power generation?

A Yes.

Q For what purposes is that coal used?

A Steam for heat.
Q Any other purpose?
A No.
Q Is there any—
A Wait a minute. We do sell some of the power generated there under a provision of a contract with [11] the Southern Indiana Gas & Electric Company in return for backup for these units when they are out of service.
Q For the purposes you have just mentioned, again does all of that coal come from mining operations of yours?
A Yes.
Q That is, of the coal producers in Warrick County?
A Yes.
Q Do you use any coal at all in your facilities in Warrick County for processing or processing heat?
A No—for heat, yes, but not for processing.
Q Do you have separate equipment that produces the steam for heating purposes as opposed to producing steam for generating power?
A No. It is bled off the boiler.
Q With respect to the coal that you own and control in Sturgis, Kentucky, is that deep coal or strip coal or both?
A Deep.
Q Approximately how many tons of reserve do you own or control there?
[12] A Around 150 million tons.
Q Is all of that coal either owned or otherwise controlled by Alcoa?
A Yes.
Q Is that coal presently being mined?
A No.
Q With respect to the coal that you own or control in Illinois, near Pinckneyville, what is the name of this field that you use?
A Beaucoup.
Q Approximately how many tons of coal are in the Beaucoup field?
A 160 million of recoverable tons, as mined.

Q Is this strip coal or deep coal?

A Deep.

Q Did you acquire this coal directly or through the offices of another company?

A Through the offices of another company.

Q Which company was that?

A United Electric Coal Companies.

Q Were you involved in the original negotiations or the decision to acquire the Beaucoup Field reserves?

[13] A No.

Q Who was involved in that, if you recall?

A Lawrence Litchfield, George Streepey, and Roy Miller.

Q Is Mr. Litchfield alive?

A No.

Q Is Mr. Streepey alive?

A No.

Q Do you know the present whereabouts of Mr. Miller?

A He is in Florida, but I do not know where.

Q Is he still an employee of Alcoa?

A No. He is retired.

Q Could you tell me generally, if you know, why Alcoa acquired and continues to own coal reserves in the Midwest?

A For the expansion of the aluminum industry's power requirements, there being an inadequate amount of hydropower that could be developed.

Q Does Alcoa purchase a substantial amount of power?

A Yes.

Q Approximately what percent, if you know?

[14] A About 45 percent—correction, and off the record.

MR. HEDLUND: All right.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. HEDLUND: Back on the record.

BY MR. HEDLUND:

Q When I asked you how much power or what percentage of the power consumed by Alcoa was purchased, I was referring to purchased from independent utilities.

A About 45 percent.

MR. CUSACK: And 55 percent is from your own generating stations?

BY THE WITNESS:

A From our own generation.

MR. CUSACK: Thank you.

BY MR. HEDLUND:

Q Does this percentage hold true with respect to your facilities in Warrick?

A No. All of the power purchased for Warrick comes from our own subsidiary with, again, the exception of backup power when one unit is out, [15] which is an exchange arrangement with Southern Indiana Gas and Electric, occasional emergency supplies, when we have a unit out. We have to buy some to hold over until we get the unit back into operation.

Q Mr. Sloane, I would like to show you now what has been marked in a previous deposition in this case as Morris Deposition Exhibit 61, and ask if you could describe this document for the record.

A Yes, sir. This is an agreement between the Alumninum Company of America and the United Electric Coal Companies concerning property in Perry County, Illinois.

It is the second such contract, embodying not only the principles of the original, but side letters of three dates between the signing of the original and the final document. It contains all of the agreement between United Electric and Alcoa.

Q Can you tell what the effective date of Morris Deposition Exhibit 61 is?

A The 3rd day of May, 1965.

Q Are you aware of any subsequent modification, amendment or cancellation of this agreement?

[16] A No.

Q Are you aware of any rights that UEC, that is, United Electric, has or any commitments by Alcoa to UEC, other than are spelled out in that agreement?

A No. This composes the complete and total agreement between the two.

Q With respect to the coal reserves in the Beaucoup Field, if Alcoa wishes to sell, lease or assign its coal rights in that field to another party, must it first offer those rights to UEC?

A No.

Q Now, Mr. Sloane, I would like to show you what has been marked in a previous deposition as Morris Deposition Exhibit 59, which is a letter from Gene Utterback of the United Electric Coal Companies to Mr. Robert S. Overbeck, General Manager of Alcoa.

A Yes.

Q I would first like to ask you if Mr. Overbeck is living.

A Yes.

Q Is he still an employee of Alcoa?

A Yes.

[17] Q Where is he located?

A Pittsburgh.

Q At or about the time that this letter was written, that is, November 29, 1962, did you have an occasion to see this letter?

A I have no recollection of having seen this letter, no.

Q Have you, since November 29, 1962, had an occasion to review this letter or to see this letter, other than in the course of the last 30 to 60 days?

A No.

Q Directing your attention to the second paragraph of this letter, it refers to a meeting on September 1, 1960, at which you are stated in the letter to have been present. Do you recall that meeting?

A Yes.

Q Do you recall that the meeting was attended by the people stated in this letter?

A Yes.

Q I would like to direct your attention to the paragraph of Morris Deposition Exhibit 59 which is lettered

(a), and I would like to know whether [18] you recall whether agreement was reached at this meeting on September 1, 1960, as described in Paragraph (a) of that letter.

A No agreement was reached in this connection.

Q Now I would like to hand you what has been marked in a previous deposition as Morris Deposition Exhibit 60, which is a letter dated December 13, 1962, from Mr. Overbeck of Alcoa to Mr. Utterback of The United Electric Coal Companies.

A Yes.

Q Do you recall whether or not you reviewed this letter or a draft of it at or about the date of its being written?

A I did not review it. I received no copy of it.

Q Do you recall discussing the contents of this letter around that time, that is, December 13, 1962, with Mr. Overbeck?

A No.

Q Directing your attention to the paragraph designated as (b), do you know or are you aware, rather, of any proposal that has ever been submitted to Alcoa by UEC as described in that [19] Paragraph (b)?

A No. There has not been one, to my knowledge, at any rate.

Q Directing your attention to the first full paragraph on Page 2 of Morris Deposition Exhibit 60, are you aware of any proposal that has been submitted in the past by UEC to Alcoa, as suggested by that paragraph?

A You refer to Paragraph (a)?

Q No, sir. I am referring to the first paragraph on the second page.

MR. CUSACK: Mr. Hedlund, I suggest that you show him Morris Deposition Exhibit 59, so he can refer to both paragraphs.

MR. HEDLUND: I will be happy to do that.

MR. CUSACK: There is a reference there.

MR. HEDLUND: There is a reference in that Paragraph 2—

MR. CUSACK: The paragraph at the top of Page 2 of Morris Deposition Exhibit 60 refers to the second to the last paragraph in Morris Deposition Exhibit 59.

[20] BY THE WITNESS:

A No definite proposal of such a nature has been made to Alcoa.

BY MR. HEDLUND:

Q Since that letter—
A Since the letter.
Q —and up to the present time?
A That is right.
MR. HEDLUND: Mr. Youker, would you mark this document as Sloane Deposition Exhibit 1 for identification, please.

(The document was thereupon marked Defendants' Sloane Deposition Exhibit 1 for identification, 3-7-69.)

BY MR. HEDLUND:

Q I now hand you, Mr. Sloane, what has been marked as Sloane Deposition Exhibit 1 for identification, which is a copy of a letter dated January 21, 1963, from Gene Utterback of United Electric to Mr. Robert S. Overbeck of Alcoa, and I ask you whether you have ever seen this letter before, that is, prior to the last 60 days or so.
A Not prior to the last 60 days, no.
[21] Q Since 60 days ago, have you had an opportunity to determine whether the original of this letter is in the files of Alcoa—
A No.
Q —and was in fact received?
A I have no—that same letter?
Q Yes.
A Yes. Such a letter is in the files.
Q And such a letter was received by Alcoa?
A Yes.
MR. CUSACK: Excuse me, please. Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. HEDLUND: Back on the record.

BY MR. HEDLUND:

Q Is Sloane Deposition Exhibit 1 for identification a direct copy of the original of that letter as it appears in the files of Alcoa?

A Yes.

Q Has Alcoa made a decision as to whether they will utilize the coal in the Beaucoup Field?

A You will have to define that a little bit [22] better. Do you mean, do we now have a decision as to time and date and so forth?

Q Yes. That is what I mean.

A We do not have it formalized to that degree.

Q At such time as Alcoa decides to utilize the Beaucoup Field reserves, if in fact it does decide to do so, what priorities, if any, will The United Electric Coal Companies be given in submitting a proposal to mine the coal?

A They have no priorities.

Q I would like to ask you, Mr. Sloane, if you agree or disagree with the following statement:

"Alcoa will call upon UEC to mine Beaucoup for it, they just naturally will."

Do you agree or disagree?

A I disagree.

MR. CUSACK: The Government objects. Mr. Hedlund is reading a portion of the Kolbe deposition transcript out of context.

MR. HEDLUND: I am not at all.

MR. CUSACK: It is not fair to the [23] witness.

MR. HEDLUND: Mr. Cusack, if you can find where that sentence appears in that form in Mr. Kolbe's deposition—

MR. CUSACK: It is awfully close, Mr. Hedlund.

MR. HEDLUND: Yes, indeed it is.

MR. CUSACK: But it is not complete.

MR. HEDLUND: Did we have an answer to that question, Mr. Youker?

A (Read by the reporter.)

THE WITNESS: I got that out before the objection was stated.

BY MR. HEDLUND:

Q Why do you disagree with that, sir?

A (Addressing Mr. Kattila) Are we still looking at the objection situation—

Q No.

A —or are we through with that?

MR. KATTILA: We are through with that.

BY THE WITNESS:

A We would, of course, ask United Electric and other coal companies for a bid on the mining of coal in that particular area, and would select [24] the best qualified and lowest bidder.

BY MR. HEDLUND:

Q At such time as Alcoa decides to utilize the Beaucoup field reserves, if such a decision is made, what factors other than price will govern its selection of the company chosen to mine the field?

A The competence of the company that submits the bid, and by "competence", I mean their overall experience in underground mining, their technical abilities as to the handling of a deep mining situation at low cost, and the ability of the company to recruit and maintain a working force adequate to do the job.

There may be other considerations, but those are the primary ones.

Q At such time as Alcoa decides to utilize the Beaucoup Field reserves, if it makes such a decision, would you recommend entering into a contract with a company whose bid price was low but who had no prior experience in deep mining and had no organization, knowhow or equipment necessary for deep mining?

A Certainly not.

[25] Q Will you tell me why not?

A Well, the mining of coal, regardless of whether it is strip or deep, is an art and a technology requiring a great deal of experience in both the handling of the equipment, the labor and the technical aspects of the problem.

If we were to depend upon an organization having none of these things, we might just as well do it ourselves and save the fee, being equally inexperienced, I would say.

Q In your opinion, would a company whose prior experience, organization and know-how had been devoted exclusively to strip mining have the requisite competence, in your judgment, to undertake deep mining?

A No.

Q Why is that?

A The two things are entirely different in their approach to the problem. Your strip mining equipment, overburden and so forth, is entirely different from your underground mining. Your recoveries are somewhat less and your machinery and equipment are entirely different.

The two know-hows are not necessarily in [26] the same field. For example, we have a great deal of know-how in strip mining, not of coal but of other materials, but no backlog of know-how at all in deep mining.

Q Are you aware of any proposal made at any time in the past by Alcoa to United Electric that Alcoa turn over any substantial amount of Beaucoup Field reserves to UEC?

Q You mean, did we make any proposal to them or did they make any proposal to us?

Q No. Did you make any proposals to United Electric?

A Not to my knowledge.

Q Do you know why Alcoa decided to utilize the coal reserves at Warrick rather than the coal reserves in the Beaucoup Field, at the time that the Warrick Reserves were opened?

A We considered that the strip mining would be less expensive and that the location of the plant, because of the town of Evansville being adjacent, would furnish

us with a substantial amount of skilled labor that would not be available in the Illinois area.

MR. HEDLUND: That is all I have.

* * * *

[42] Q Is it a fair statement to say, Mr. Sloane, that Alcoa would plan to use the coal in the Beaucoup Field by the late 1970's?

A It is possible, I would say even probable.

Q I understand. Could you tell us where or in what manner Alcoa would use this coal in the probability of employing the coal in the Beaucoup Field? Would there be a smelter?

A It would be used on a smelting plant, yes.

Q Would it be for electrical generation for a smelting plant?

A Electrical generation for a smelting plant, not necessarily located adjacent to the coal field.

Q But in the general area?

A In the area, yes.

Q This is ordinary steam coal, is it not, sir?

A Right.

Q Mr. Sloane, directing your attention to Morris Deposition Exhibit 60, which is a letter from Mr. Overbeck to Mr. Utterback of December 13, [43] 1962, I ask you, sir: What chance does United Electric have to mine the Beaucoup Field in the eyes of Alcoa?

A Do you mean to say by that, good, poor or excellent, that kind of an answer?

Q Well, would it be fair to say that Alcoa will give United Electric serious consideration for United Electric's mining the Beaucoup Field reserves?

A Yes. We will give them serious consideration.

Q All right. Thank you.

Mr. Sloane, have you ever heard of the Round Prairie Field?

A Yes.

Q Could you tell us what it is?

A It is a field adjacent to the Beaucoup Field, north and east, I believe.

Q Of Beaucoup?

A Yes.
Q Who owns that field, do you know, sir?
A United Electric, I believe.
Q Mr. Sloane—
MR. HEDLUND: I am going to object to [44] this line of questioning as being entirely outside of the scope of the direct examination.

BY MR. CUSACK:

Q Mr. Sloane, in the event that—
MR. HEDLUND: I want to have a standing objection to this line of interrogation.

BY MR. CUSACK:

Q Mr. Sloane, in the event United Electric—one preliminary question. Do you know whether or not the coal in the Round Prairie Field and the coal in the Beaucoup Field is the same coal, the same general field?
A The same general field, yes.
Q Would it have the same general characteristics?
A As far as I know, yes.
Q In the event, Mr. Sloane, that United Electric opens up an underground mine at the Round Prairie Field, do you think that the chance of United Electric, or shall I say, the serious consideration given to United Electric by Alcoa to mine the Beaucoup Field would be increased?
A Not necessarily. It depends on their [45] mine shaft location. If, for example, it were immediately adjacent to our field, it would have an effect—
Q What affect—
A (Continuing)—and if it were considerably further away, it would have no effect at all.
Q Assuming that the mine shaft was considerably close, was placed close to the Beaucoup Field and that this was a proper, competent, underground mine, well constructed, what chance do you think United Electric would have in mining Beaucoup?
A I think they would have a good chance. It would make economic sense.
Q A little bit about the Beaucoup Field, if we could,

sir, a little about the geology. What number is the seam at Beaucoup, do you know?

A Number 6.

Q Do you know the thickness of it?

A It varies from 61 inches to 96 inches and averages about 78.

* * * *

[48] Q Now, you also testified that in Texas you purchased reserves for power generation which were oil and natural gas, is that correct?

A Yes—wait a minute. We did not purchase those. We developed them.

Q You developed them?

A Yes.

Q I see.

A We did our own drilling and development.

Q Do you contemplate that Alcoa will use oil or natural gas for electrical generation in the midwest?

A No.

Q Could you tell us why?

A Because we can obtain coal generation cheaper.

Q Is coal the preferred fuel for electrical generation in the midwest?

A Yes.

Q Do you contemplate that this will continue?

A Yes.

Q For about how long?

A Until such time as atomic energy can [49] produce electricity at the same cost.

Q Can you give us some idea when you think this will take place?

A I cannot answer that one, not being qualified, but I can tell you what our consultant has to say about it.

Q Let's hear what the consultant said.

MR. HEDLUND: I object as hearsay.

MR. CUSACK: You may go ahead.

BY THE WITNESS:

A The consultant tells us that in that particular area, and we are talking about the midwest now, it will never be as low in cost of generation as mine mouth coal.

Q Mr. Sloane—
A That is, with that particular location in mind.
Q With the midwest in mind?
A Yes.
Q What is the name of the consultant, sir?
A General Nichols.
Q Where is he located, please?
A Washington.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF HUGH E. PETERSEN, TAKEN MARCH 13, 1969

* * * *

HUGH E. PETERSEN,

called as a witness by the defendants herein, having been by me, the said Claude W. Youker, Jr., as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories, and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Will you state your name, please.
A Hugh E. Peterson.
Q What is your home address?
A 120 Thorntree Lane, Winnetka.
Q Are you appearing for your deposition this morning pursuant to subpoena, Mr. Petersen?
A Yes, I am.
Q By whom are you employed?
A J. W. Petersen Coal & Oil Company.
Q What is your business address?
A 800 West Division Street in Chicago.
Q What is your present position with the [4] J. W. Petersen Coal & Oil Company?
A I am President of the Company.
Q When was the Petersen Company founded?
A In 1899.
Q Could you describe briefly, Mr. Petersen the nature of your company's business?
A We are basically retail coal distributors. About 75 percent of our business is in retail coal; the other 25 percent is retail oil. The coal business is the backbone of our business.
Q What is your approximate size in the coal retailing end of the business in Chicago?
A We are the largest retailers of coal in Chicago.

Q How long have you yourself been in the coal business, Mr. Petersen?

A Twenty-eight and a half years.

Q Were other members of your family in the business?

A Yes. My grandfather started the business in 1899, and my father was president of the company until his death last fall.

Q What positions have you held during your 28 years with the company?

[5] A When I started, I worked as the shipping clerk at our Division Street yard, which is our office here, our yard here. I then went to our Rogers Park yard as a salesman and worked several years selling in the Rogers Park area.

Then I came back to Division Street and was Sales Manager of our Division Street sales force, and then handled the sales for all three yards as General Sales Manager, in the capacity of Vice President of Sales.

Then my father was in poor health for a number of years toward the end, and I was in the office about half of the time and the other half of the time outside selling, or handling sales.

Q Would it be fair to say, Mr. Petersen, that you are an experienced coal executive, knowledgeable in the sale of coal to the retail trade?

A I believe I am.

MR. FUTTERMAN: We object to that question and move to strike on the ground that it is leading.

BY MR. KEMPF:

Q How many tons of coal did your company [6] sell during 1968, Mr. Petersen?

A Approximately 345,000 tons.

Q How many coal yards does your company operate?

A Three.

Q Do these all have rail facilities?

A They all have rail facilities, but our Division Street yard has water facilities which is what we use fundamentally for the bringing in of coal to this yard. The other two yards are entirely rail.

Q I would like to turn for a moment, Mr. Petersen, to your company's coal-purchasing activities. First of all, from what general areas does the Petersen Coal & Oil Company secure its coal?

A We buy coal from southern Illinois, western Kentucky, eastern Kentucky and West Virginia.

Q Approximately how much of your coal, in terms of percentage, comes from southern Illinois and west Kentucky?

A Approximately one-half; 50 percent.

Q And the other half?

[7] A From eastern mines, eastern Kentucky, fundamentally, and some from West Virginia.

Q In purchasing coal, is your company able to secure volume train rates?

A We buy everything on volume train rates unless the mines are in a position that they cannot ship volumes, but we practically insist that it come by volumes because there is a freight saving.

Q Does your company purchase any coal from the Freeman Coal Mining Corporation?

A Yes, we do.

Q Approximately how many tons per year?

A During the last twelve months we purchased approximately 45,000 tons of coal. The year before it was about half that much because we were operating an affiliated company on the South Side which did the purchasing, and they purchased about 25,000 tons, but that purchasing has been combined, now, in the last twelve to eighteen months; it has all been bought by Petersen, and it was about 45,000 tons from Freeman.

Q Does your company purchase any coal from The United Electric Coal Companies?

[8] A No, we do not.

Q To whom does the Petersen Coal Company sell coal?

A We sell to apartment buildings and apartment hotels. I would say in excess of 95 percent of our tonnage goes to apartment buildings and apartment hotels.

Q For what purpose do these customers use the coal which they purchase from you?

A It is for heating.

Q Are there any particular types of furnace which these apartment buildings or apartment hotels have?

A Yes. They have almost all underfeed stokers.

Q Is an underfeed stoker furnace capable of burning any type of coal?

A No, it is not. In our opinion—well, it just is not, that is all.

Q Does the coal have to meet certain characteristics?

A Yes. It should be a low ash, fairly low ash coal, less than seven or eight percent ash.

[9] It should be high fusion so the coal does not melt when it is pushed, in the event of a cold morning when the fan comes on full blast the coal cannot melt, and it should be around 2300 degrees fusion, which a boiler gets up to in those conditions.

Q Is that a maximum or a minimum?

A That is at least a minimum. We feel around 2300 degrees fusion point of the ash, it should be. Every coal melts at a certain temperature and it should not melt at a lower temperature than 2300 degrees.

Q All right.

A It should be a fairly high heat content coal or BTU coal, about 13,000 BTU per pound, and this again is to get the heat up within a certain prescribed time.

In other words, the stocker cuts on, say, at 5:30 or quarter to six in the morning, and he should have heat on the building within an hour or so on a cold morning, and it has to have that much heat to conform to that.

Q Does the coal which you buy from Freeman meet these characteristics?

[10] A Yes, it does.

Q Would coal from United Electric's mines in Fulton County and Belleville work satisfactorily in an underfeed stoker?

A No, it will not. In our opinion it is not coal that does give satisfactory performance in underfeed stokers.

Q Does United Electric compete for that segment of the coal business?

A No. I do not believe they have competed. We have never bought any coal from them, and as far as I can remember they have never even solicited our business.

Q Are you familiar with the air pollution legislation that has been enacted here in Chicago?

A I am very familiar with it.

Q Will this have any effect on the general use of coal from UEC's mines in Fulton County and Belleville in the Chicago area?

A Yes. It will be ruled out of the Chicago area due to the sulfur content.

On July 5th of this year there is a sulfur limitation on coal used in the Chicago area. The coal cannot exceed two and a half percent sulfur, [11] and that will rule out all the United Electric coal, I believe, that they have, and then the sulfur limitations drop further in the years ahead, but it will be ruled out with the first limitation.

Q Does your company encounter competition from other fuels in selling coal to apartments and apartment hotels?

A We certainly do. The gas company is tremendously active and are successful in taking a considerable amount of business every month, every year. We are continuing to lose substantially.

Q How does this work?

A They appeal to the apartment building owner through television, radio and newspaper ads, and solicitation, too, on the grounds that gas is cleaner, it does not have any smoke, and they try to get across the idea that it is not much more costly, although we feel that it is considerably more costly, but they have this slogan, "Gas does the big jobs better for less," and it seems to be catchy and influences some people.

There is labor saving with gas. A janitor certainly is anxious to see gas go in because then he does not have to get up and start [12] his stoker first thing in the morning, and have to be on the job at 6:30.

Some of these janitors have as many as seven and eight buildings and today they are largely coal-fired, which means that he has to get an early start and cover his buildings, whereas with gas heat he can sleep later.

Q What about the actual cost of conversion? Is that high?

A No, it is not. They have got that down to a fairly reasonable point, and they can use existing boilers, so it is not a big cost factor.

Q What about delivery and storage problems?

A Well, of course, with gas they can then convert the coal bin to a laundry room or what-have-you.

They also can avoid a coal delivery every week or every ten days, whatever it might be, every few weeks.

As careful as we try and be with delivering coal, you still have some dust which gets into the basement which, again, if people are drying laundry or have things stored, will get some coal dust on it.

[13] Another problem that we are going to be facing in this air pollution ordinance, which is going to favor gas, is the fact that garbage will not be allowed to be burned a year from July 5th in a boiler, and this is going to be very hard on coal.

MR. KEMPF: Off the record, please.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. KEMPF: Will you read the last answer, please, Mr. Reporter.

(The record was thereupon read by the reporter as above recorded.)

BY MR. KEMPF:

Q Continue, please, Mr. Petersen.

A Garbage today is burned in the boilers of almost all coal-fired apartment heating plants and provides heat value which lowers the overall cost of heating.

When the ordinance regarding garbage burning goes into effect on July 5th, 1970, apartment buildings will either have to have the garbage hauled or burn it in a double barreled gas-fired [14] incinerator.

We feel that most buildings will put in incinerators and at that time, when this type of installation is being made, many of them will go to gas-fired boilers for heat-

ing, or I should say, will put gas into their present boilers for heating.

Q In the light of all this, Mr. Petersen, what is the long range outlook for the retail coal market which your company serves?

A We feel that the retail coal industry, as an industry, if you can call it that, has a life of only about five years.

We feel that it will still exist, that is, there will still be companies selling retail coal in Chicago for many years to come, and we intend to be one of them, but I think you could compare it to the ice business, where today there are two or three ice companies left, selling ice.

All two or three of them—there are several left—are doing a good and profitable business, but it could hardly be considered much of an industry any more, whereas 25 or 30 years ago it was a very large industry.

[15] It was a lot like retail coal, where they had a large number of ice companies selling ice by truck and delivering it to apartment buildings and homes and so on, and now there are just a couple left. I think this is just about the way the retail coal business is going to go, gradually, and within five years it is going to be a fraction of its present size here in Chicago.

Q What about new apartment buildings and apartment hotels that are being constructed? Do any of those use coal?

A I do not know of a single new apartment building that has put in coal, in the Chicago area. All of these are gas heat or electric heat.

There are very few on oil, an occasional one on oil, but gas and electric are the ones who are getting this business.

Q You have described a number of characteristics which you said a coal must have to be used in underfeed stokers which are found in apartments and apartment hotels. Does the City of Chicago have any legislation which seeks to insure that when a customer orders a specific type of coal it is in fact delivered to him?

[16] A Yes. There are ordinances pertaining to the weighing of coal, the ticketing of coal and prohibiting the mixing of two kinds of coal.

We operate under quite stringent limitations on what we can do with regard to delivery or mixing. There is no mixing of coal allowed in Chicago.

Q Has the fact that both Freeman and UEC have been controlled by one company had any effect on the J. W. Petersen Coal Company?

A No, not at all.

Q Why is that?

A Well, we do not buy from United Electric. We do not feel their coal is applicable. We have bought from Freeman and when they combined, it had no effect on us at all.

Q Do you see any adverse effect on your company if General Dynamics is allowed to continue owning both Freeman and United Electric?

A No. I do not.

Q Would there be any benefit to your company by forcing Freeman and United to operate independently of each other?

A No.

• • • •

[29] Q What do you anticipate will be the annual retail consumption of coal in Chicago in five years?

MR. KEMPF: I am going to object to this question. He said he had difficulty piecing together what it was even in years past, and for him to estimate what the combined total will be for 55 companies, I think he testified there were, seems to me to be indulging in the highest form of speculation.

BY MR. FUTTERMAN:

Q Would you answer the question, please, Mr. Petersen?

A That is going to be very conjectural, because we do not know how difficult the Air Pollution Department will be with users of coal.

For example, I received a call yesterday afternoon from one of my larger customers who, under the existing

ordinance, had received two arrest tickets on two separate buildings in the last week. He felt that the Air Pollution Inspector had been extremely harsh and wanted me to contact the Air Pollution Department and have them be more moderate.

[30] Incidentally, when, under the present rules of the Air Pollution Department, he gets a second arrest ticket, he will go to court where there will be a court case and a considerable fine.

I told him, "It's about like calling up the Police Department and asking the Police Commissioner to not have the police so hard on somebody because he has one speeding ticket and the next one he will be in trouble, possibly in jeopardy on even driving his car."

If the attitude of the press and the political climate in Chicago is such that air pollution is something that is being pushed to eliminate, as fast as possible, they can, under these ordinances, practically, by the fear of these arrest tickets and fines, accelerate the conversion to gas, so to answer your question as to what it will be in five years, I just do not know how hard this may be.

I would say that certainly we are going to lose, as a minimum, ten percent a year, and it could be greater than that, so carrying that out, I would say as a minimum, we would have lost half of our business in five years, and very probably [31] 60 or 70 percent of our business at the end of five years.

Q In your opinion, has there been an increase or decline or has use stayed the same for oil in the home heating market in Chicago?

MR. KEMPF: I am going to object to this as being outside of the scope of my direct examination. I did not raise this at all.

MR. FUTTERMAN: Would you answer the question, please.

BY THE WITNESS:

A We are very small in our oil sales, compared to the Chicago market. We consider ourselves coal people basically.

We have handled oil with people who burned coal and converted to oil and who wanted to stay with us, but I do not consider myself an expert at all in oil. In answer to your question, though, I would say there has been a decline in the use of oil in the heating market in Chicago, due to the activities of the Gas Company.

* * * *

[34] Q Is coal cheaper than oil for apartment buildings?

A Yes.

Q Is coal cheaper than electricity for apartment buildings?

A Yes.

Q Mr. Petersen, have you ever conducted any tests or analyses of coal that comes from Central Illinois and Fulton County?

A What do you mean, have we ever conducted any tests? What do you mean by a test and what do you mean by "we" conducting?

Q Has your company ever analyzed the coal from Central Illinois and Fulton County for purposes of determining whether or not it will be suitable for the apartment building market in Chicago?

MR. KEMPF: I object to this as having been asked and answered in the course of my direct examination. I went into this subject at length.

MR. FUTTERMAN: Would you answer the question, please, Mr. Petersen.

BY THE WITNESS:

A We have in the past purchased a car or [35] two of coal from Central Illinois and had Commercial Testing & Engineering Company run tests on it and put this coal out into apartment buildings to try, if that constitutes what you mean by running tests. That is what we have done.

BY MR. FUTTERMAN:

Q What is the name of the company you are operating on the South Side?

A Mogg Coal & Oil Company.

Q Was that previously an independent company?

A It was owned by the owners of the Petersen Coal & Oil Company plus some other people.

Q Have you ever purchased any coal from United Electric?

A I believe some years ago we bought some coal from United Electric, but it was quite a few years ago.

Q Where was that coal from?

A From their Buckheart Mine, if I recall correctly. That was the name of one of the mines we bought from. I am going back a few years now, and I do not specifically recall the mine names.

[36] Q When was the last time you were solicited by a United Electric coal salesman?

MR. KEMPF: I am going to object to that as outside of the scope—withdraw the objection.

BY THE WITNESS:

A Probably five years ago, or four years ago.

BY MR. FUTTERMAN:

Q Can you give us the name of the man who solicited you?

A Dave Ford, I believe, was the last man I talked to from United Electric.

Q What kind of coal was he trying to sell you at that time?

A Banner.

Q Did you make any tests or analyses of the Banner coal he was trying to sell you?

A Yes, we did. We got a couple of cars of it.

Q What were the results of those tests?

A We felt it was not of a quality to use in our business.

Q Prior to four or five years ago, or the [37] last time you testified that a United Electric salesman called upon you, did a United Electric salesman call on you on a regular basis?

A What do you mean by "regular"?

Q Well, did they come around once a year or once every few months, trying to sell United Electric coal?

A I would say that maybe once or twice a year we would hear, or maybe a little more than that. I really forget.

Q You know, do you not, that Banner coal is used by the Metropolitan Sanitary District for its industrial plants?

A I have only heard this. We have never bid on any of this type of business. It is heavy steam business.

Q Subsequent to 1964 or 1965, is it your testimony, then, that United Electric ceased to call on you or ceased to solicit your business?

MR. KEMPF: I would like to have that question read by the reporter.

Q (Read by the reporter.)

BY THE WITNESS:

A Yes. I would say that is true. Mr. [38] Tarzy was the sales manager, and I would once in a while run into him on the street and he would say hello, but I would not say he ever really solicited.

He knew we were not interested in what he had, and I think that is why he just did not push it.

BY MR. FUTTERMAN:

Q Did Mr. Tarzy ever refer you to Freeman Coal?

A Did he ever refer me to Freeman Coal?

Q Yes.

A For what purpose?

Q For the purpose of buying coal.

A We were buying from Freeman long before they were combined.

Q Did you ever have any conversations with Mr. Tarzy concerning your purchases of Freeman coal?

A No.

Q Who else do you buy coal from besides Freeman Coal Mining Corporation?

A Currently, right now, at this particular time, or within the last several years?

Q At this time, right now.

A Right now.

* * * *

[45]

REDIRECT EXAMINATION

BY MR. KEMPF:

Q During your cross examination by Mr. Futterman, you made reference to the University of Illinois Chicago Circle complex.

A Yes.

Q Do the furnaces which burn coal there have underfeed stokers?

A No, they do not.

Q Do they have chain grate stokers?

A I understand they are chain grate stokers.

Q You also referred to the Metropolitan Sanitary District. Do they have underfeed stokers?

A I am sure not. Again, I have never gotten into those plants, but they are heavy steam producers and they would have equipment such as a chain grate or spreader in those.

Q Are a chain grate stoker or a spreader significantly different from an underfeed stoker?

A Yes, they are.

Q With reference to the coal requirements that must be met by coal in order to be used in those furnaces, are they also substantially different?

[46] A Yes. They can use a much lower grade coal satisfactorily in most of them.

Q You referred to the provision of the air pollution ordinance relating to variances during the course of your cross examination.

If a company such as Edison sought a variance and it were granted, what sort of provisions would the granting authority make? Would this allow them, in other words, to continue to use the high sulfur coal indefinitely, or would there be some phase-out?

MR. FUTTERMAN: I object to that question on the same grounds that you raised for your objection, namely, that the ordinance itself would be the best source of information.

THE WITNESS: Do you want me to answer?
MR. KEMPF: Yes.

BY THE WITNESS:

A I understand that they would be granted a variance for a certain period of time and then if they had to go beyond, they would come in again and ask for an extension of that—

MR. FUTTERMAN: I withdraw the objection.

[47] BY THE WITNESS:

A (Continuing) —but I am not an expert on this.

MR. FUTTERMAN: I withdraw my prior objection.

BY MR. KEMPF:

Q You stated during the course of your cross examination that you had at one time tested some Central Illinois coal.

A Yes.

Q Did the Central Illinois coal prove to be satisfactory?

A No, it did not.

MR. FUTTERMAN: Just a minute, please, Mr. Petersen. Would you re-read that question, please, Mr. Youker.

MR. KEMPF: The witness has answered the question.

(The record was thereupon read by the reporter as above recorded.)

BY MR. KEMPF:

Q You stated during the course of your cross examination that Mr. Tarzy and the other sales personnel of United Electric knew that you [48] were not interested in their coal. Is this because you told them that?

A I believe they knew that we had tested this type of coal and found it unsatisfactory, and as a result just did not feel there was any purpose in pursuing it with us.

Q This, then, would account for their not soliciting you in recent years?

A Yes.

MR. FUTTERMAN: I object as leading, and move to strike as suggestive.

MR. KEMPF: I will restate the question.

BY MR. KEMPF:

Q Would this account for their failure to solicit your business in recent years?

A Yes, it would.

MR. CUSACK: Objection as calling for opinion and hearsay, and move to strike.

The witness has no knowledge of the frame of mind of United Electric's employees.

* * * *

[2]

EXCERPTS FROM DEPOSITION OF JOHN T. MIDDLETON, TAKEN MARCH 13, 1969

* * * *

JOHN T. MIDDLETON,

a witness of lawful age, was duly sworn by the notary public and, being examined by counsel, testified as follows:

DIRECT EXAMINATION

BY MR. HAUBOLD:

Q Sir, would you state your name and present position?

A I'm John T. Middleton; I'm Commissioner of the National Air Pollution Control Administration, which is an agency in the Department of Health, Education and Welfare.

* * * *

[12] These documents in turn then were sent to the Governors [13] of the affected states—using your illustration of Chicago, to the Governor of Indiana and the Governor of Illinois—together with a letter explaining what the actions were to be as a result of his receipt of these documents and the resultant action is that set forth in the Clean Air Act as amended, namely, the Governor has the opportunity to indicate his intent to establish air quality standards. He has then a specified period of time in which to establish the air quality standards for the criteria announced—sulfur oxide and particulate matters —and an additional 180 days for the development of an implementation plan which is actually a production of strategy.

Q The production of strategy plan you just mentioned, is it in accordance with your understanding of what that plan should include to comply with the law? Does this plan have to consist of legislation or formal action by the State Government?

A The implementation plan very simply is a strategy that would be adopted on an interstate basis to assure the air quality standards adopted are met.

Q This could presumably include legislation contemplated or other means of controls that the states intend to utilize to effect their standards, is that correct?

A It could include a variety, a large gamut of things that could be used.

[14] The intent of the Act is to allow states to exercise as much versatility and enervation as possible in arriving at ways to reduce the present air pollution to acceptable levels and, furthermore, to actually prevent future air pollution.

Q Does your office review plans that are submitted by the states to see if they conform with standards which you have developed?

A In keeping with the Air Quality Act of '67, the Clean Air Act as amended, the Secretary will approve the standards—review the implementation plans, determine whether the standards proposed are consistent with the criteria.

Our Administration will be responsible for making recommendations to the Secretary.

Q Is the National Air Pollution Control Administration, has it been designated by the Secretary to perform these functions?

A Yes, it has.

Q What action is contemplated under the Clean Air Act if the state's standards are not sufficient in your judgment?

A Would you repeat the question?

MR. EISEN: Do you want to repeat the question? I have an objection as soon as he repeats the question.

(The reporter reads back the pending question.)

* * * *

[18] The appropriate legislative responsible jurisdiction that will be geographically involved in our system is identified in the consultation records and in the Federal Register.

Q I see.

These are set forth, the various counties?

A Specifically listed—it may or may not be a county. There is no question about the political jurisdiction that will be involved.

Q Now, Dr. Middleton, for the record could you identify the various pollutants which have been designated by the National Air Pollution Control Administration?

A Yes.

Q Would you do so, sir?

A The air quality criteria for sulfur oxides and the second one for particulate matter.

Q How do you define particulate matter?

A Any gross substance in the atmosphere in particle form, be it liquid or solid.

Q How do you define sulfur oxides, for purposes of this?

A Any combination, any compound, be it hydrogenuous or heterogenous, that contains sulfur and oxygen.

* * * *

[38] Q Is it a fact, Dr. Middleton, that a substantial number of Federal facilities have converted their fuel systems in the past several years from coal to gas or other fuels which emit a lower rate of sulfur oxide?

A I am not aware of the specific number of these, but I would certainly be disappointed if there had not been a response to the Executive Order requirement in our regulations.

Q You stated, Dr. Middleton, that new techniques may become available which would enable you to, in essence, clean up the present fuels, such as high sulfur coal, and enable you to utilize the presently existing system.

Do you have any knowledge as to what the time table would be for this? Do you have any opinion?

A Yes.

Let me introduce the subject by saying it is the policy of this Administration to be certain that we not only use the existing coal supplies but to make certain that those that may become available are properly developed, because this nation's fuel energy requirements require that all the existing coal, oil, et cetera, be used.

Within that framework then, this National Air Pollution Control Administration has established a research and development program—unfortunately only very recently—which [39] is dedicated to developing the several kinds of ways in which the sulfur oxides and particulate matter problems can be abated.

Our research and development effort in this regard really only began with significance only in 1967—there was an effort a very few years before that. We presently spend about fifteen million dollars specifically on sulfur oxide removal from coal—sulfur oxide removal from the combustion of coal, I should say, excuse me.

The systems—there are nine areas, and I think maybe we can only speak to three of them very briefly—one is the cleaning of coal. There are ways today to clean coal, simply by the removal of ash in today's cleaning system removes some sulfur.

We are spending a considerable amount of money to develop a system called deep coal cleaning. This is a system in which we separate coal into a clean part and a dirty part—the normal cleaning system allows you clean, dirty and in-between and very often one loses a lot of the Btu in such a cleaning system. Our purpose is to develop a coal cleaning system, mechanical, in which the pyritic form of sulfur is removed by mechanical means—mechanical meaning usually specific gravity arrangement.

[40] This program is well on its way in areas where most of the sulfur is pyritic. This could be brought into play today in areas where the pyritic form is such that it is difficult to remove mechanically—by air separation, for instance. We'd have to develop these newer techniques. We're in the midst of this project and I would expect within two, two and a half years that these systems would be developed on a commercial scale, so they are imminent.

Q Dr. Middleton, I don't mean to interrupt you, but in terms of coal cleaning this process is not adaptable, if I understand it correctly, where the coal sulfur or the sulfur in the coal is of an organic nature, is that correct?

A That's why I mentioned that this is for coals that are pyritic. Most Illinois coals are—strike that, I think we'd better start over.

MR. EISEN: Can I interrupt here for a moment?

I don't think your statement was a proper statement of the record of Dr. Middleton's testimony.

He said that, as far as the removal—as I understand it—the removal of sulfur, insofar as the organic materials, pyritic materials—

THE WITNESS: Pyritical materials.

MR. EISEN: —there are such systems presently [41] developed, and I thought he said in two or two and a half years—

MR. HAUBOLD: If you want to testify,—

MR. EISEN: You were summarizing the man's testimony and I thought you were summarizing it incorrectly. You said as far as the organic, the non-pyritic material.

Now, maybe I'm not summarizing it correctly—

MR. HEDLUND: Why don't we let Dr. Middleton take care of it?

MR. EISEN: —that such would be available in two or two and a half years, commercially available.

THE WITNESS: Why don't I give you a recapitulation? I think we're becoming far too involved in the terminology and not enough in the time scale of the general policy of this Administration.

Today one cleans coal for a variety of reason, primarily to take the ash out. Today, in taking out ash, you also take out some sulfur. It is in the form of iron pyrites. None of the sulfur is taken out if it is solely organic sulfur in that system.

Second point: We have a significant research effort to define systems for deep cleaning of coal that will take out not only the large pyrites but small pyrites. We expect this [42] system to be available commercially within certainly two years, two and a half. This system would be—probably would remove eighty to ninety percent of the pyrite sulfur in coal. Given a satisfactory sized distribution it will not take out the organic sulfur.

Then, three, I spoke to Illinois coal. Illinois coal typically—and by saying typically, I realize that there is a

vast range of sulfur leves in the form in which sulfur is present in the coal in Ilinois, but on the average about half the sulfur in coal in Illinois is in a pyritic form, so, if one had a four percent sulfur and it was—excuse me, a four percent sulfur in coal, and half of this was in pyritic form and the nature of the form of that pyrite was such that it was amenable to the mechanical cleaning, one could derive a two percent coal from that four percent coal. If the pyritic form were so finely divided that it could not be separated by specific gravity means, then one could not effectively clean that coal.

It is for several of these technical reasons that we also have other ways of dealing with the sulfur oxide problem.

BY MR. HAUBOLD:

Q Just to make sure we have this, that I am certain what your statement is, you say that you would hope that there would be an economically viable system within two to three years?

[43] MR. EISEN: I don't think that Dr. Middleton had an opportunity to finish his answer.

Have you finished your answer?

THE WITNESS: I was going to move away from the technology into other ways that we were going to do this.

MR. HAUBOLD: I merely wanted to ask this question to clarify this so we can move on to this other subject.

MR. EISEN: I'd like Dr. Middleton to have the opportunity to answer the question completely.

THE WITNESS: There's a great deal more that could be said—in fact, we are looking forward to the separation of deep cleaning of coal as a way not only of providing a clean portion which would not require any subsequent treatment, but may I call the other portion dirty—in other words, high in the sulfur content—providing a new way of burning that, so that we in combustion develop heat and power as well as sulfur products so that the coal resource is more eficiently and effectively used than it has been heretofore.

This is the nature of our research and technology program, directed towards the policy that we will make optimum use, maximum use, best use of coal as a resource in this country. Rather than throwing away the dirty piece, we will be using that as a source of energy and sulfur compiles. In addition, the [44] same process could be used to reduce the size of compiles as a variety of other beneficial aspects.

I did not speak to the economics of the situation. One must presume that, if it is to be adopted for commercial use in a satisfactory market, we have every expectation that that is not the problem.

I then was moving into the other area of gas cleaning, which is a system in which you burn whatever fuel you have, collect the gas stream and treat it. This is a very significant part of our research and development program. There are a number of techniques that are in the early generation stage and there are a few that are fairly well developed.

There are still other ways of combating sulfur oxides and one is the—excuse me—the physical location, the geographic location of power plants, the nature of the fluidized bed combustor, the kinds of stacks, the height of the stack, its relationship to the meteorology of the area, so that to really consider control of sulfur oxides one must look far beyond the limiting of the use of fuels based on the sulfur content.

It's our expectation to have a spectrum of control techniques available which will not only facilitate but enhance the use of coal.

[45] BY MR. HAUBOLD:

Q Can you make any predications, Dr. Middleton, based on a reasonable degree of certainty in your own mind, as to what this time table will be?

A We have a dry limestone injection system for demonstration at the Tennessee Valley Authority now, which are probably sixty percent or better efficient, which are on 25 megawatt power plants. It looks as though these will be successful. They will have some use in some places.

Since we're at that size, we know that design barometers, whereas there is a degree of speculation at this point I would expect control techniques to be commercially developed from this in certainly a two to four year period.

The wet limestone scrubbing, a system now used by two locations, Kansas City and St. Louis, stems from the combustion engineering organization. Since this is in place and operating, although still at a demonstration stage, I think again with some improved research—excuse me, some more research to further improve the system, that here we are again at an area in which the—certainly the two to four year, two and a half to five years, these would be able to be retro-fitted on existing power plants to take care of sulfur oxides in the gas stream, in the gas cleaning systems.

Around the corner and a little further away perhaps [46] are still better techniques for the cleaning of stack gases. These include the metal oxides, alkalized aluminum and the molten carbonate systems.

If the question is when will some of these be commercially applied, I would estimate that the deep cleaning of coal is in the fairly early stages of application—the average period would certainly be three years or less. The wet limestone in its present problems—engineers being the kind of creatures they are—I would expect this to be commercially adoptable in certainly two and a half to four years. The molten carbonate, while it's a much more sophisticated and much more effective system and it produces a useful product, sulfur, it is just now going into the bench pilot stage, but the nature of the system is such that we may be able to avoid going through the demonstration phase, so here again we might expect the system to be commercially applicable—I mean actually designed into the construction of new power plants, it would not be applicable to existing power plants—in power plants to be constructed in four to five years.

We are then on the threshhold of some significant breaks in the control of sulfur oxides.

Q Again, Dr. Middleton, without appearing to be repetitive, I just want to make sure we are clear on one

thing and [47] that is, the deep cleaning method removes only pyritic sulfur?

A You have gotten the message.

Q Fine.

Dr. Middleton,—

A I must add a word of caution—it only removes pyritic materials that are of a size that it may be removed by air separation or other mechanical means.

It's not just if it's pyritic, it's the nature and distribution of the pyrites in coal.

Q Do you have sufficient information, Dr. Middleton, as to what the combustion engineering system will cost?

MR. EISEN: What combustion engineering system?

MR. HAUBOLD: He referred to a system—

MR. EISEN: You mean the company, Combustion Engineering system?

THE WITNESS: I did not refer to it as combustion engineering. I referred to it as a wet limestone scrubber as presently being sold by Combustion Engineering.

I do not know at this time what these costs are since it is in the demonstration stage with two commercial power plants. I think one would be able to draw the conclusion that it's within feasible economic range.

BY MR. HAUBOLD:

[48] Q When you say that a system would be commercially adoptable, do you mean economically adoptable as well as feasible from a technical standpoint?

A I mean that it would be technically feasible and economically possible to use.

MR. HAUBOLD: Fine.

MR. HEDLUND: Could we go off the record?

(Discussion off the record.)

MR. HAUBOLD: As to the following documents, pursuant to agreement of counsel who have stipulated as to the authenticity of these documents, the following documents are offered: First, Air Quality Criteria for Sulfur Oxides; number two, Control Techniques for Sulfur Oxide Air Pollutants; number three, Air Quality Criteria for Particulate Matter; four, Control Techniques for Par-

ticulate Air Pollutants; five, Report of the Secretary of Health, Education & Welfare to the United States Congress, dated January 1969; next is the Progress in the Prevention and Control of Air Pollution.

On the first document, we should also describe that as Air Pollution Abatement by Federal Facilities Report, dated January 1969.

The next is a report entitled Progress in the Prevention and Control of Air Pollutions, Second Report of the [49] Secretary of Health, Education & Welfare, dated January 1969, and finally—

• • • •

[3]

EXCERPTS FROM DEPOSITION OF P. W. DORRANCE, TAKEN MARCH 20, 1969

* * * *

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name, sir?
A Philip W. Dorrance.
Q By whom are you employed?
A Alcoa Minerals of Jamaica, Incorporated.
Q What is your present position?
A General Manager.
Q Are you a citizen of the United States of America?
A Yes.
Q Mr. Dorrance, could you briefly describe your educational background and your employment experience?
A I am a graduate Mining Engineer with a B.S. in Mining Engineering from Michigan Technological University; served three and a half years United States Naval Reserve, as Engineering Officer and Captain, then Lieutenant Senior Grade—discharged with the rank of Lieutenant Senior Grade in 1949; employed by Aluminum Company of America 1945/1946 as a Mining Engineer at Rosiclare, Illinois—first by mining operations, and also as an Engineer/ [4] Manager of their zinc mining operations in the state of Kentucky. I was at these operations for ten years. In 1956 I was transferred to the Aluminum Company of America Headquarters Office, Pittsburgh, as Staff Engineer. I was at Pittsburgh for 12 years, during which time I was engaged in mining administrative and technical duties in Alcoa's lignite operations in United States and foreign countries. In 1968 I started my present postion in Kingston, Jamaica.
Q Could you again, very briefly, please, but generally, describe your functions and responsibilities, at present, for Alcoa?
A At present for Alcoa I am General Manager in

charge of our bauxite mining and shipping operations and also our construction activities for alumina plant here in Jamaica.

[5] Q Between 1956 and 1960 to whom did you report in Pittsburgh?

A Mr. Roy Miller, Chief Mining Engineer at Alcoa.

Q Then did you continue to report directly to Mr. Miller until his retirement?

A Yes.

Q And when did he retire?

A October 1962.

Q Are you familiar with the coal reserves that Alcoa presently owns or otherwise controls?

A Yes.

Q And throughout, Mr. Dorrance, when I will be speaking of coal, I will not be including lignite. Could you describe generally where these reserves are located?

A Generally in the Ohio river valley in the mid-western parts of the United States.

Q Are some of these reserves located in Indiana?

A Yes.

[6] Q In what county, if you recall?

A Warrick.

Q Some of the reserves are located in West Kentucky?

A Yes.

Q Approximately where?

A Union and Webster counties.

Q And are some of these reserves located in Illinois?

A Yes.

Q In what county in Illinois, or near what town?

A Well, near Pickneyville, Illinois.

MR. CUSACK: Let it be stipulated that this is in Perry County.

MR. HEDLUND: What is the name that is used by Alcoa to refer to the reserves that it controls in Southern Illinois?

A Beaucoup Field.

Q Are you familiar with the acquisition of those reserves by Alcoa?

A Yes.

Q Approximately when were the reserves in Indiana acquired?

A In 1956/1957/1958.

[7] Q Approximately when were the reserves in West Kentucky acquired?

A In the same years.

Q When were the reserves in Southern Illinois acquired?

A The same period.

Q It is fair then to say that these reserves in these three fields were all acquired at or about the same time?

A Yes.

Q Would you tell me please exactly how Alcoa acquired the reserves in the Beaucoup field?

A Through an agreement with United Electric Coal Companies, in which United Electric Coal Companies agreed to acquire options and leases on the underground coal reserves, and to acquire these in the name of Alcoa, and to hold the same when exercised or purchased in the name of Alcoa.

Q Who, if you know, initiated this program? Was this initiated by Alcoa or by U.E.C.?

A By Alcoa.

[8] Q Who were the people directly involved at the outset of this, for Alcoa, and who for United?

A Initially, at the outset, Mr. Miller for Alcoa and, I believe, Mr. Sherril and Mr. Utterbeck for United Electric.

Q Mr. Dorrance, I wish to show you what has been marked in a prior deposition as Kolbe exhibit 61. I ask you to look at it and tell me if you can identify this document.

A This is the agreement between the United Electric Coal Companies and the Aluminum Company of America, by which the United Electric Coal Companies will acquire the coal reserves in the Beaucoup area for the Aluminum Company of America.

Q I do not recall, Mr. Cusack, whether we have a standing stipulation with respect to Kolbe deposition exhibit 61. If we do not, will you stipulate that that standing stipulation may abide to this document?

MR. CUSACK: As it was our exhibit in the Kolbe deposition I would so stipulate and ask you to so stipulate.

[9] MR. HEDLUND: It is so stipulated.

Q Is there any strip coal acreage in the Beaucoup field that is owned or otherwise controlled by Alcoa?

A No.

Q Prior to the agreement executed by Alcoa and United Electric Coal Companies, which is Kolbe deposition exhibit 61, did Alcoa make an attempt to acquire strip coal acreage in the state of Illinois?

A Yes.

Q Would you describe what attempts Alcoa made along that line?

A Well, after preliminary investigations indicated there were strip coal reserves held by certain coal companies in Illinois, Alcoa in preliminary discussions with these coal companies attempted to determine under what conditions the reserves might be available.

[10] Q Were any of these companies United Electric Coal Company—the ones that you have just now referred to?

A No.

Q Were you able to successfully conclude any such discussions with these companies with respect to Illinois strip coal reserves?

A No.

Q Could you tell me generally why not?

A Because Alcoa wanted to acquire the reserves in ownership with no strings attached as to future use.

Q And then do I understand that none of these companies were interested in such arrangements with respect to strip reserves in the state of Illinois?

A As far as I know, no.

MR. CUSACK: Strike the last answer as being speculative.

Q Did you enter into any agreement with any Illinois coal producing company other than United Electric with respect to strip reserves in the state of Illinois?

A No.

[11] Q Did you make any investigation of the availability of strip coal reserves in Illinois, for acquisition, from someone other than a coal producer?

A Yes.

Q What were the results of your investigations?

A The investigation indicated that there were no significant strip reserves available in Illinois other than those owned by coal companies.

Q Between 1956 and 1962 were you generally familiar with the working of the agreement between United Electric and Alcoa?

A Pardon?

Q Between 1956 and 1962 were you generally familiar with the working of the agreement between United Electric and Alcoa, which agreement is Colby deposition exhibit 61?

A Yes.

Q Could you state generally your responsibilities in that regard?

[12] A My responsibilities in regard to the agreement were to work with the people in the United Electric Coal Companies, in Alcoa's interest, as to the options they were acquiring and to the possibilities of the existence of coal in these options and leases, and in general to supervise the administrative agreement for Alcoa.

Q Of the three fields of coal reserves which you have described, which of those three has been developed to the point of mining?

A The Warrick, Indiana coal field.

Q Why were those reserves developed rather than the reserves in either the Beaucoup field or those in West Kentucky?

A From the point of a coal reserve, they were developed because they were strip coal and they were obtainable under the provisions that we felt were most beneficial to Alcoa for the development of our first complex, based on mid-western coal reserves.

[13] Q You state one of the reasons they were developed was because they were strip reserves. I wonder if you could tell me what you mean by that?

A Because of the economical advantage strip reserves have over underground coal reserves.

Q Are you aware of any discussions between Alcoa and United Electric, or correspondence, between 1956 and 1960, regarding the capability of the United Electric Coal Companies to develop the coal at Beaucoup?

A No.

Q Why did you not raise that question, or Mr. Miller, if you know, with United Electric during that period?

A Because it would have been a premature investigation as we did not at that time expect to use these coal reserves for some time.

Q Mr. Dorrance, I am going to hand you a letter dated December 13, 1962, from Mr. R. S. Overbeck of Alcoa to Mr. G. F. Utterbeck of United Electric Coal Company, which [14] has been previously identified in the deposition as Morris deposition exhibit 60, and I would like to direct your attention, please sir, to the second to last paragraph on page 1 of this letter which is designated with a (b), and the first paragraph on the second page of this letter, and I would also like to hand you a copy of a letter of November 29, 1962 from Mr. Utterbeck of United Electric to Mr. Overbeck of Alcoa.

MR. CUSACK: The last letter is Morris deposition exhibit 69.

MR. HEDLUND: That is correct.

Q Have you had time to review these?

A Yes.

Q With reference to the letter of December 13, 1962, which is Morris deposition exhibit 60, are you aware of any specific proposition that United Electric has made to Alcoa for leasing part of the coal in the Beaucoup field?

A No.

[15] Q Are you aware of any proposal—specific proposal, by United Electric to Alcoa, for United Electric to lease up to fifteen million tons of coal from Alcoa in the Beaucoup field?

A No.

Q Are you aware of any proposal that has been made by Alcoa to United Electric whereby Alcoa would sell,

assign or otherwise convey, for consideration, coal reserves in the Beaucoup field to United Electric?

A No.

Q Had such proposals been made between 1956 and 1968, that is prior to your coming to Jamaica, would you have been aware of such proposals?

A Yes.

MR. HEDLUND: I believe that is all I have.

[16] CROSS-EXAMINATION

BY MR. CUSACK:

Q Mr. Dorrance, you testified under direct examination in regard to an investigation made by Alcoa regarding available strip reserves in Illinois?

A Yes.

Q And this investigation was, shall we say, two-fold? You investigated strip reserves owned by coal companies—is that correct?

A Yes.

Q And then you investigated strip reserves not owned by coal companies. Is that correct?

A No. Our investigation, according as I recall, my testimony was that all significant coal reserves in the state of Illinois were owned by coal companies; therefore, we did not approach people other than coal companies in investigating or discussing strip coal reserves in Illinois.

Q And who conducted this investigation for Alcoa?

A Mr. Miller.

[17] Q Mr. Roy Miller?

A Yes, and prior to my coming to Pittsburgh, a fellow named William Barnes.

Q And was this report finalized in a memorandum of some sort?

A I am not sure.

Q Have you recalled seeing a memorandum in regard to this investigation?

A No, I recall from discussions with Mr. Miller.

Q Is it fair to say everything you know in regard to this investigation was from Mr. Miller himself?

A No, because after coming to Pittsburgh we were approached and discussions were held with some coal companies in relation to strip coal reserves in Illinois.

Q And which coal companies did you have discussions with?

A Ayrshire Coal Company.

Q That is Ayrshire Colliery Corporation?

A Yes.

Q Of Indianapolis?

A Yes.

[18] Q And who did you talk with in Ayrshire?

A This wasn't a personal discussion. This was a discussion between Mr. Miller and Ayrshire.

Q Did you have any conversation with Ayrshire?

A No.

Q Did you have any conversation with any one from any other coal company with regard to strip coal other than in Illinois?

A No.

Q Is it a fair statement to say that the information you had in regard to available strip coal reserves in Illinois was from your discussions with Mr. Miller?

A Yes, and a review of some correspondence that he had with other coal companies.

Q And could you tell us what this correspondence consisted of?

A I can't recall exactly.

Q Would it be letters—memoranda?

A Letters.

[19] Q And can you tell us who these letters were from?

A In this regard the only thing I can recall is that Ayrshire Collieries indicated that they would be willing to discuss their strip coal reserves in the so-called Denmark field in Southern Illinois with Alcoa.

Q And was this on condition that Ayrshire would mine the coal?

A No conditions were stated, just that they were willing.

Q And what did Alcoa discuss with Ayrshire?

A I was not aware of the details.

Q And who conducted those discussions with Ayrshire for Alcoa?

A Mr. Miller, if there were such detailed discussions.

Q Do you recall if there were any detailed discussions held?

A No.

Q Other than with Ayrshire, did you have any other discussion with regard to strip coal?

A No. You are talking about myself?

[20] Q Yes.

A No.

Q And were you present during any conversation with Mr. Miller in regard to strip coal reserves in Illinois, with any other coal companies?

A Yes, sir. I think at one time we discussed, in a general way, the strip coal reserves, with officials of Peabody Coal Company.

Q And who did you talk with at Peabody?

A I think it was Mr. W. J. Weimer.

Q Do you remember what year this was?

A No. It was during the period of our acquisition program—1956, 1957, 1958.

Q And where did this meeting take place?

A I can't recall.

Q You recall what Mr. Weimer stated to you?

A No, I can't recall that either.

Q Is it fair to say that all the information in regard to strip coal reserves in Illinois in the possession of Alcoa, [21] during this period over which we are having discussion, was obtained from coal producers in Illinois?

A No.

Q Where else did you obtain information?

A From Illinois Geological Survey.

Q Mr. Jack Simon?

A I believe he was head of the Division at that time.

Q What did you obtain from Mr. Simon?

A Such data that the Illinois Geological Survey had on the strip coal reserves of the state of Illinois at that time as they were willing to give to Alcoa.

Q And did you study this material yourself, sir?

A No.

Q Who did the study?

A Mr. Miller.

Q Mr. Miller reported to you the result of his investigation with regard to this material?

A In general conversation, yes.

[22] Q But you did not investigate it personally? Is that correct?

A No. The investigation of strip coal reserves—the availability of strip coal reserves—by Alcoa was done prior to my being connected with the coal reserve program for Alcoa.

Q This was before you got into this business?

A A little bit before.

Q And by Mr. Miller?

A Yes.

Q Mr. Dorrance, you testified that there is no strip coal acreage at the Beaucoup field. Is that correct, sir?

A Yes.

• • • •

[28] Q Did Mr. Utterbeck ever state to you whether or not United Electric planned to mine the underground reserves at Round Prairie?

A Yes.

Q He stated that they did intend to underground mine it?

A Yes.

MR. CUSACK: I have no further cross-examination, but move to strike, on the ground of hearsay, Mr. Dorrance's testimony in regard to the availability, or the lack of strip coal reserves in Illinois.

MR. HEDLUND: In addition to such arguments that we may make, subsequently, the fact is Mr. Dorrance is qualified to testify that in fact Alcoa made an attempt, or investigated the availability of strip reserves from other than coal producers in the state of Illinois, and that such investigation and attempt was not successful?

MR. CUSACK: Why don't you save your argument for the judge, Counsellor?

[29] RE-DIRECT:

MR. HEDLUND: When did you have these conversations with Mr. Utterbeck concerning United Electric's intention to mine underground the Round Prairie field?

A As I recall, about 1960.

Q With respect to your lignite operations in Texas, generally, what factors are present which permits you economically to mine the lignite in the presence of one hundred and twenty feet of overburden?

A Well, the size of the stripping machines available and the nature of the overburden, generally, and the thickness of the lignite seam also.

Q How thick is that seam?

A Ten to twelve feet.

* * * *

[31] MR. HEDLUND: I think that is all.

MR. CUSACK: Mr. Dorrance, in regard to the stripping of your lignite reserves in Texas you stated that there have been increases in the stripping of overburden due to the size of the machines. Is that correct?

A It is possible to strip to the depth we are stripping because of the machines that are available.

Q From what companies are these available?

A Bucyrus-Eric, and the other company is Marion.

Q And are you using in Texas a drag-line?

A Yes.

Q Do they all—do you know whether or not there is also in production shovels which can strip to a hundred and twenty feet of overburden?

A Yes.

Q Do you know whether a wheel excavator can strip to a hundred and twenty feet of overburden, either by itself or in tandem with another machine?

A Yes.

* * * *

[34] Q Based on this differentiation between a ton of coal and a ton of lignite can you give us an opinion,

based on your knowledge and experience, as to what thickness bituminous coal would have to be, to be equivalent to the thickness of your Texas lignite reserves?

MR. HEDLUND: I object to the question in that form. It cannot be answered.

A It would be rather difficult to answer it. It would be a guess.

Q It would be less than ten to twelve feet?

A I really wouldn't be qualified to say. I don't know.

Q You spoke of a 1960 conversation with Mr. Utterback of United Electric with regard to United Electric mining the Round Prairie field. Is that correct?

A Yes.

Q Can you tell us where this conversation was held? Do you recall?

A In our Alcoa, Pittsburgh Office.

[35] Q And Mr. Utterback came and talked to you about this and other matters?

A Yes.

Q And who else was present at this conversation?

A I think just Mr. Utterback and myself.

Q And did Mr. Utterback indicate what time he thought United would underground mine the Round Prairie field?

A Not the specific time, no.

MR. HEDLUND: In terms of the factors that go into whether or not strip reserves can be economically mined, are there factors involved other than the thickness of the coal seam and the height of the overburden?

A There are many factors involved; that is why it is very difficult at this time to make any statement as to whether or not certain coal reserves can be coal mined or not.

MR. HEDLUND: I have no further questions.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF LEON KING, TAKEN MARCH 25, 1969

* * * *

LEON KING,

called as a witness by the defendants herein, having been by me, the said Claud W. Youker, Jr., as notary public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name, sir.
A Leon King.
Q What is your home address, Mr. King?
A 1700 West Copeland.
Q In what city?
A Marion, Illinois.
Q Are you appearing for your deposition this morning pursuant to a subpoena, Mr. King?
A Yes, sir.
Q By whom are you employed?
A Barbara-Kay Coal Corporation.
Q What is your business address?
[4] A Manager or President of the company.
Q What is the address?
A 397, Marion, Illinois; Box 397.
Q What is your position presently with Barbara-Kay?
A President.
Q How long have you been in the coal business, Mr. King?
A It will be 30 years.
Q When did you first start in the coal business?
A When I was eighteen.
Q Has most of your time been spent with the Barbara-Kay Coal Company?

A Yes, sir.
Q What positions have you held with Barbara-Kay?
A Well, face boss, mine manager, mechanic, everything there is to do in a coal mine.
Q Have you accumulated a considerable amount of knowledge, experience and expertise in mining and selling coal during your years in the coal business?
A I think so. I should have, anyway, over [5] the period of years.
Q How many mines does Barbara-Kay operate?
A One.
Q How many employees does the company have?
A Twenty-nine union men.
Q How many of these are underground miners?
A Sixteen.
Q Approximately how many tons of coal does Barbara-Kay produce each year?
A Approximately 100,000 tons a year.
Q What seam are you mining in, Mr. King?
A Number 5.
Q Is the Barbara-Kay a deep mine or a strip mine?
A An underground deep mine.
Q Approximately how deep is the coal you are mining?
A At the shaft it is approximately a hundred feet, and where we mine, it's close to 200 feet.
Further north, back away from the shaft, it's deeper.
Q What do you estimate the remaining coal reserves at the Barbara-Kay coal mine to be?
[6] A Anywhere from eight to ten years.
Q Do you have rail loading facilities at your mine, Mr. King?
A No, sir.
Q How does the truck move from your mine, then?
A You mean, how does the coal move?
Q Yes.
A By truck, cars, pickups and big trucks.
Q Do you own your own trucks?
A No, sir.
Q How do people secure coal?
A They come in there and want some coal and we load their truck and sell it to them.

Q To whom do you sell your coal?

A Any individual or anybody that comes in and asks for the coal. Mostly local farmers and trade around the business places, some business places.

Q For what purpose do they use the coal?

A Most of it is heating homes.

Q Do you sell any coal to utilities?

A We only sell surplus coal, mostly, to REA, their plant south of Marion.

[7] Q About how far south of Marion is that?

A Ten miles, fifteen maybe.

Q Do you have a washer and sizer out at the Barbara-Kay Mine?

A Yes, sir.

Q How many different sizes of coal does Barbara-Kay make?

A We make a nut coal, an egg coal, and three sizes of stoker coal. The stoker coal is washed. The other is hand picked.

Q The Government is contending in this lawsuit that coal is coal. What do you think of that contention, Mr. King?

MR. FUTTERMAN: Objection.

MR. KEMPF: Do you want to state the basis for your objection?

MR. FUTTERMAN: Yes. The question is devoid of meaning.

MR. KEMPF: I do not understand what your objection is.

MR. FUTTERMAN: I am objecting on the ground that I think you can make that question a little bit more clear.

MR. KEMPF: Let me restate the question.

[8] BY MR. KEMPF:

Q The Government is contending in this lawsuit that coal is coal. Mr. King, I am asking you what you think of that contention.

MR. FUTTERMAN: The same objection.

BY THE WITNESS:

A Well—

MR. KEMPF: Answer the question.

THE WITNESS: Shall I go ahead and answer?

MR. KEMPF: Yes.

BY THE WITNESS:

A Well, coal is not coal. I mean, if the Government thinks coal is coal, if you try to sell any on contracts, why, there's as much difference as daylight and dark in that, because they don't want to buy it that way because you have got to fill out a form about a mile long, analysis, sulfur and all that, and it has to be prepared and washed and cleaned up.

BY MR. KEMPF:

Q Does coal vary a great deal—let me restate the question.

Do various types of coal differ from each other, Mr. King?

[9] MR. FUTTERMAN: I object to that question on the ground it is leading.

BY THE WITNESS:

A Various types?

MR. KEMPF: I will withdraw the question and restate it.

BY MR. KEMPF:

Q Can the coal characteristics which you have just enumerated, such as sulfur and things like that, vary from coal mine to coal mine?

A Yes, sir.

Q Do customers take account of differences such as those you have enumerated when they are buying coal?

A No. The local trade doesn't.

Q What does the local trade use their coal for?

A To heat homes and small business places.

Q Is most of the coal which can be secured by the local trade in this area coal which has characteristics to other coal in the area?

MR. FUTTERMAN: I object to that question on two grounds. It is not only leading, but I do not understand the question.

[10] MR. KEMPF: Would the reporter please read the question, and if it is not clear, I will be happy to restate it.

Q (Read by the reporter.)

MR. KEMPF: It is not clear. Let me put it this way.

BY MR. KEMPF:

Q Does most of the coal which the local trade to which you refer buys come from this area?

A (No answer.)

Q In other words, is most of the coal which the local trade uses produced by mines in this area?

MR. FUTTERMAN: Excuse me. Objection. What do you mean by "this area"?

MR. KEMPF: The area in and around Marion, Illinois.

BY THE WITNESS:

A I don't believe I understand the question, either. Is most of the coal mined used around this area?

MR. KEMPF: No.

BY MR. KEMPF:

Q What I am asking is this: With respect to the local trade, to which you have referred—

[11] A Yes.

Q (Continuing)—do they buy coal which is produced by mines in and around the Marion area?

A Oh, yes. Because of the hauling, they wouldn't go 25 or 30 miles from here to buy coal, when they could buy it that close.

Q Most of the coal which is produced in this area right around here, that you refer to, is the coal from one mine similar to coal from another mine?

A Number 5 seam is approximately the same.

Q So that someone who is buying for the local trade is interested in securing No. 5 coal?

MR. FUTTERMAN: Objection as leading.
MR. KEMPF: I will withdraw the question.

BY MR. KEMPF:

Q What kind of coal is used by customers who are buying coal for purposes of generating electricity, such as the REA plant to which you referred?
A Well, they want as cheap a coal as they can get, with the highest BTU's.
Q Would a coal which is satisfactory for their purposes always work satisfactorily in the [12] furnaces which the local trade people have?
MR. FUTTERMAN: I object as leading.
MR. KEMPF: Go ahead. Answer the question.

BY THE WITNESS:

A Well, the same vein of coal, but they have to have the fine coal, where the others have to have a larger size. That's the only thing I can answer to that, is that the same coal will work but it has to be a different size. I may not understand your question, I don't know.

BY MR. KEMPF:

Q You stated earlier, Mr. King, that the customers who buy coal for purposes of generating power will buy on the lowest cost per million BTU's.
MR. FUTTERMAN: I do not think Mr. King stated that, and I think the record will accurately reflect what Mr. King stated.
MR. KEMPF: I will ask the reporter to re-read Mr. King's prior answer.

(The record was thereupon read by the reporter as follows:

"Q What kind of coal is used by customers who are buying coal for purposes [13] of generating electricity, such as the REA plant to which you referred?

"A Well, they want as cheap a coal as they can get, with the highest BTU's.")

MR. FUTTERMAN: Would you please read Mr. Kempf's last question, Mr. Youker.

Q (Read by the reporter.)

MR. KEMPF: Thank you for re-reading the answer, Mr. Youker. I will restate my question.

BY MR. KEMPF:

Q You stated earlier that those who purchase coal for purposes of generating power are interested in getting the cheapest coal possible with the highest BTU. My question is, does the BTU capability of coal vary from mine to mine and according to size?

A To the best of my knowledge, yes.

Q Do some furnaces have a higher BTU requirement than others?

A Yes.

Q Will all coals work in all furnaces?

A No, not as far as—I mean, I don't think they will.

[14] Q Another contention that the Government is making in this lawsuit, Mr. King, is that coal mined anywhere in the midwest is in competition, either actual or potential, with all other coal mined in the midwest. I would like your view of this contention, Mr. King.

MR. FUTTERMAN: I object. That calls for a conclusion of the witness on one of the issues to be resolved in this lawsuit.

MR. KEMPF: Go ahead and answer the question, please.

BY THE WITNESS:

A Again, I don't know whether I understood it or not.

MR. KEMPF: I will ask the reporter to read the question, please.

Q (Read by the reporter.)

BY MR. KEMPF:

Q Do you understand the question now?

A No, I don't.

MR. KEMPF: All right.

THE WITNESS: I'm sorry.

MR. KEMPF: I will rephrase it.

[15] BY MR. KEMPF:

Q Is the transportation cost of coal an important factor in selling coal?

MR. FUTTERMAN: Objection to leading the witness.

MR. KEMPF: Answer the question, please.

BY THE WITNESS:

A Yes. It is our great factor.

BY MR. KEMPF:

Q Could Barbara-Kay sell its coal to consumers located in places like Peoria, Springfield, Belleville or towns in Kentucky?

A Well, if there was no mines there close, but our transportation to mines in that direction, we have to go a different direction where there's no mines on account of transportation.

Q How much does it cost to move a ton of coal from the Barbara-Kay Mine to the nearest rail-loading facility?

A Approximately 70 cents a ton.

Q What is the nearest rail loading facility?

A The Missouri-Pacific.

Q Where is that?

A In Marion, Illinois.

[16] Q Does this place your mine at any competitive disadvantage when comparing it to a mine which has rail facilities which run right into the mine?

A Yes. We have the extra trucking cost of delivering it to the railroad.

Q Have you ever had any experiences where this has proved a handicap to you?

A Yes. We had a possible chance of selling coal to the Dundee Cement place, but because of the extra cost of hauling, the 70 cents, we couldn't meet their prices, and I think Old Ben maybe taken it.

Q Does Barbara-Kay compete for the business of utility companies?

A No—well, wait a minute. Compete? You mean, fight for it?

Q Sure.
A No.
Q Why not?
A I can't mine it that cheap, on account of the low seam and small machinery to load the coal.
Q Has there been a decline in the number of small producers such as Barbara-Kay in recent years, Mr. King?
[17] A Yes. There's several out there that started little mines years ago, and I don't know as it was competition, but they worked out, old age and labor problems. They couldn't operate.
Q Is there competition between coal and other fuels such as gas, oil and electricity, Mr. King?
A There sure is. There's an awful big competition now, because they're going to gas and oil in heating homes as fast as they can be put in.
Q Do they also try to convert existing facilities? If someone has a coal furnace in their home at the present time, for example, do you encounter competition from the gas and electric people and oil people trying to get that homeowner to convert to some other form of fuel?
A I think they do. They do some advertising that they do, anyway. There's so much—I don't know, month's free rent or free gas or free this and that. I guess in some advertising they put in that they give them a discount on different electricity things or gas things.
Q Has the problem of air pollution had any effect on the coal industry?
[18] A I think so, yes. It's going to, if it keeps on. It's going to raise the cost.
Q Will the proposed legislation concerning mine safety, if passed, have any effect on the coal companies?
A It'll raise the cost on us.
Q Would someone like yourself, Mr. King, with a great deal of experience and knowledge about operating a deep mine, be able to open a strip mine operation?
A Well, I couldn't open a strip mine operation. I mean, there's just as much difference as daylight and dark between strip and underground, because it's different machinery, different knowledge, altogether different.

Q Would that work the other way also? Would someone whose experience has been limited to strip mining run into similar problems trying to open a deep mine?

MR. FUTTERMAN: I object to that question. It calls for conjecture on the part of the witness.

MR. KEMPF: Go ahead and answer, please.

[19] BY THE WITNESS:

A As far as I know, because I don't know nothing about the strip, and I don't think if he's working in a strip, he would know anything about underground, so it would still be the same way.

BY MR. KEMPF:

Q Now, you have indicated that your mine is producing approximately 100,000 tons of coal per year.

A Yes.

Q Would someone with your experience and knowledge be able to open a deep mine producing a million or two million tons a year?

A Well, I couldn't, and I don't think that anyone else could, because there's just as much difference there as daylight and dark between the small mines and the large mines.

Q Has the fact that both Freeman and United Electric have been controlled by General Dynamics had any adverse effect on the Barbara-Kay Coal Company?

A No. They haven't bothered us one bit. They have helped us in a way, I think.

Q Will there be any adverse effect on the [20] Barbara-Kay Coal Company if General Dynamics is allowed to continue owning both Freeman and United Electric?

A Will there be any what?

Q Adverse effect on your company, if General Dynamics is allowed to continue owning both Freeman and United Electric.

A Not as far as I can see.

Q Would there be any benefit to Barbara-Kay by forcing Freeman and United to operate independently of each other?

A Not as far as I can see.

MR. KEMPF: I have no further questions.

MR. FUTTERMAN: I have a few questions, Mr. King.

CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mr. King, you testified that Barbara-Kay's production is currently about 100,000 tons per year, is that correct?

A Approximately that.

Q Has Barbara-Kay's production increased over the past five years?

• • • •

[37] BY MR. KEMPF:

Q You testified, Mr. King, that your company, Barbara-Kay, has sold coal in the past to the REA plant just south of Marion.

In the last five years, has Barbara-Kay sold to any other utility?

[38] A Not direct that I know of.

Q What do you mean by that?

A Not direct, like we sell there. There may be some other coal went to it that I don't know about, sold to trucks, you see, and they took it to them. As far as I know, I don't know.

Q Has Barbara-Kay ever sold to the Union Electric Company?

A Union Electric?

Q Yes.

A Not as I know of.

Q Has Barbara-Kay ever sold to Commonwealth Edison Company?

A Not that I know of; not direct, anyway.

Q Would Barbara-Kay have the production reserves —let me rephrase that question.

Would Barbara-Kay have the production and the reserves to be able to bid for the business of Union Electric or Commonwealth Edison or other big utilities?

A No.

Q You mentioned that Freeman had made some truck sales to the local trade during the course of your cross-examination by Mr. Futterman.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF JOSEPHINE C. BURTON, TAKEN APRIL 14, 1969

• • • •

JOSEPHINE C. BURTON,

called as a witness by the defendants herein, having been by me, the said Frances B. Spina, as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and she did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. IRVING:

Q Will you please state your full name.
A Mrs. Josephine C. Burton.
Q Mrs. Burton, what is your current home address?
A 6819-A South Prairie.
Q What city is that?
A Chicago 60637.
Q Are you appearing for this deposition this afternoon pursuant to subpoena?
A Yes.
Q Mrs. Burton, by whom are you employed?
A General Services Administration, Federal Supply Service, Procurement Branch.
[4] Q Is that a division of the United States of America, the Federal Government?
A Yes, it is.
Q What is your office address?
A 219 South Dearborn, Room 1386, Chicago 60604.
Q What position do you hold in the Federal Supply Service?
A I am a Procurement Agent.
Q And how long have you been employed as a Procurement Agent?
A As a Procurement Agent, four years—rather, two years. Two years as a Procurement Agent.

Q And how long have you worked for the Federal Supply Services?

A Ten years.

Q What is the nature of the work performed by you as a Procurement Agent, Mrs. Burton?

A Well, we contract for certain supplies within Region 5, which is comprised of Illinois, Michigan, Indiana, Kentucky and Ohio.

Q Is that Region 5?

A Region 5.

[5] Q Of the GSA?

A Right.

MR. IRVING: I ask the Reporter to mark for identification, as Burton Deposition Exhibit 1, a document entitled "Solicitation, Offer, and Award Contract GS-05S-4945" issued August 1, 1967, and covering a contract for the purchase of coal through June 30, 1968.

(The document was thereupon marked Burton Deposition Exhibit 1 for identification, 4-14-69.)

BY MR. IRVING:

Q Mrs. Burton, I will hand Exhibit 1 to you and ask if you recognize this.

A Yes, I do.

Q Have I correctly described this document?

A Yes, you have.

MR. IRVING: I ask counsel for plaintiff if the standing stipulation with regard to documents will apply.

MR. FUTTERMAN: Not at this time.

[6] BY MR. IRVING:

Q Now, Mrs. Burton, is this the most recent solicitation and award for coal purchased for this building, Item 12, United States Courthouse and Federal Office Building here in Chicago?

A Yes. This is the last procurement.

Q Did you prepare this Solicitation, Offer, and Award document, Mrs. Burton?

A Yes, I did.

Q I ask you to please turn to Page 18 in this docu-

ment. Under Item No. 12 the code name for this building is an entry entitled "Analytical Limits," and one entitled "Size Required."

When you were preparing this solication, Mrs. Burton, from whom did you secure these analytical limits and size requirements which Public were incorporated into the solicitation-offer?

[7] A From the Public Building Facility, the Public Building Office, Operations Branch.

Q Is that also a branch of the General Services Administration?

A Yes, it is.

Q Mrs. Burton, does the solicitation to bid state what would happen if someone submitted a bid which did not meet one of the analytical limits set forth in this invitation?

A Yes. If you will notice on page 6, I believe it is, at the bottom of the page, it says:

> "BUREAU OF MINES ANALYTICAL RECORDS: (a) No bid will be considered on coal offered from mines on which the Bureau of Mines does not have analytical records. (b) Whenever the bidder's guaranteed analysis of coal offered or the latest Bureau of Mines analysis of the coal offered shows the offered coal not to be in conformance with the specifications set forth in this Invitation, the bidder's offer shall be rejected as being non-responsive."

Q Thank you.

[8] Do you verify the specifications which an offeror will contain in his bid?

A Yes, we do.

Q With whom do you do that?

A Bureau of Mines.

Q Just to make it clear, does the invitation specify what will happen if the Bureau of Mines reports that the coal from the mine in question does not meet the analytical limits contained in the bid invitation?

A The same paragraph "Bureau of Mines Analytical Records" applies.

Q And what page is that on, please?

A On page 6.

MR. IRVING: I have no further questions at this time.

CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mrs. Burton, I have a few questions I would like to ask you on cross examination.

Would you please turn to the cover of Burton Deposition Exhibit No. 1.

A Yes.

• • • •

[3]

EXCERPT FROM DEPOSITION OF JOHN P. NIX, TAKEN APRIL 14, 1969

* * * *

MR. FUTTERMAN: At the request of counsel for the defendants, counsel for the plaintiff will stipulate to the authenticity and genuineness of those documents covered by this stipulation as hereafter from time to time described and identified, and will not object at trial to the admissibility of such documents on the grounds that counsel for the defendants has failed to prove the authenticity or genuineness of the documents, and that it was in fact prepared and received by individuals named in the document. The right to object to the admission into evidence on any other grounds for such documents is specifically reserved.

MR. KEMPF: It is so stipulated.

Will the Reporter please swear the witness.

(The witness was thereupon duly sworn.)

JOHN P. NIX,

called as a witness by the defendants herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows: [4]

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name.
A John P. Nix.
Q What is your home address, Mr. Nix?
A 1052 South Edson Avenue, Lombard, Illinois.
Q Are you appearing for your deposition this afternoon pursuant to a subpoena, Mr. Nix?
A Yes.
Q By whom are you employed?
A General Services Administration.

Q Is that a branch of the Federal Government?
A Yes.
Q Where are your offices?
A Room 1186, 219 South Dearborn.
Q In what city?
A Chicago.
Q What branch of the General Services Administration are you with?
A I am with the Public Building Service, Building Management Division.
Q Could you describe briefly for us your [5] duties, Mr. Nix?
A Yes. I am a building management officer, responsible for the physical plant and crafts operations in Region 5, General Services Administration.
Q What is Region 5?
A Region 5 consists of the six states: Illinois, Indiana, Kentucky, Ohio, Wisconsin and Michigan.
Q For how many years have you been involved in this type of work?
A Three.
Q And for how many years have you been with the GSA?
A Five.
MR. KEMPF: I hand the Reporter a document entitled "Term Contract Ordering Data for: "FSC Group 91 Fuels, FSC Class 9110—Coal, Veterans Administration Facilities and Federal Public Buildings, within the states of Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin," for the effective period of the date of award through June 30, 1968.
I ask the Reporter to mark this as Nix Deposition Exhibit No. 1 for identification.

[6] (The document was thereupon marked Nix Deposition Exhibit 1 for identification, 4-14-69.)

BY MR. KEMPF:

Q Mr. Nix, I hand you what has been marked as Nix Deposition Exhibit No. 1 for identification, and I ask you if you recognize it.

A Yes, I do.

Q Have I correctly described the document?

A Yes, you have.

MR. KEMPF: I ask counsel for the plaintiff whether the standing stipulation will apply to this document.

MR. SIMS: Not at this time.

BY MR. KEMPF:

Q Mr. Nix, did you participate in the preparation of some of the data set forth in this document?

A I did.

Q Please turn to Page 14 of the document.

You will note that Item 19 is identified as the U. S. Courthouse and Federal Office Building, 219 South Dearborn Street, Chicago, Illinois.

Did you participate, Mr. Nix, in the [7] preparation of data set forth in Item 19?

A I did.

Q What data would that be, Mr. Nix?

A The data shown in the column marked "Estimated Quantity," and the data shown in the column marked "Size Offered" and "Guaranteed Analytical Limits."

Q What do the figures represent that are set forth in the column titled "Size Offered" and "Guaranteed Analytical Limits"?

A They represent the specifications for the coal involved.

Q By "involved" are you referring to that facility identified in Item No. 19?

A For this particular facility.

Q How were these specifications arrived at?

A By contacting the equipment manufacturer of the boiler-stoker equipment for his recommendations regarding the type of coal to be used, and by our experience in burning various types of coal. That is it, for this particular one.

Q You say "for this particular one." What other factor might enter into that?

A Subsequent to the date that this was [8] issued, regulations were issued limiting the sulphur content,

which were not in existence at the time that this particular specification was prepared.

Q I see. Thank you.

Is a great deal of care taken in the preparation of these specifications?

A Yes.

Q Turning to the individual specifications, Mr. Nix, I notice that one of them refers to 3/4" mesh washed screenings. Why is that particular specification used?

A This is the most suitable size coal for the particular boiler.

Q What type of a boiler is this?

A It is a Combustion Engineering high pressure water tube boiler, with a chain grate stoker.

Q Might this particular specification be different if the facility had some other type stoker or a pulverizer?

A It might.

Q I note that another of the specifications is for a minimum ash softening temperature [9] of 2,130 degrees Fahrenheit. Why wouldn't a coal with a lower ash softening temperature—

MR. SIMS: Objection, counsel. I don't think anyone has explained the initials.

MR. KEMPF: All right, counsel.

BY MR. KEMPF:

Q What are the initials A.S.T.? What do they stand for?

A Ash softening temperature.

Q And what does the initial F. stand for, after 2,130 degrees?

A Fahrenheit.

Q Why wouldn't a coal with a lower ash softening temperature than that specified be used at this facility?

A Coal with a lower ash softening temperature might tend to cause problems on the grates, due to excessive clinkering or melting of the ash.

Q Do different pieces of equipment have different coal specification requirements?

THE WITNESS: Would you rephrase—

MR. KEMPF: Do you want me to rephrase that?

THE WITNESS: Yes. "Different pieces of [10] equipment," I am not too sure what you mean.

BY MR. KEMPF:

Q When I say "different pieces of equipment," I am referring to the different types of fuel burning equipment at the different facilities which are set forth as separate items on this schedule, and my question is:

Do the different types of equipment or pieces of equipment which are used at the various facilities have different specifications for the coal which is burned there?

MR. SIMS: What type of fuel facilities, counsel?

MR. KEMPF: The ones set forth in this schedule.

MR. SIMS: I don't see any fuel facilities set forth in the schedule.

MR. KEMPF: Well, Item 19 refers to one facility, which is the United States Courthouse and Federal Office Building, and if you will look at the next—

MR. SIMS: That is the destination point.

BY MR. KEMPF:

Q Mr. Nix, do the size offered and guaranteed [11] analytical limits refer to fuel consumed at the destination designated in the second column?

MR. SIMS: That is leading, counsel.

MR. KEMPF: No, it is not. It is just a straightforward question.

Please answer, Mr. Nix.

BY THE WITNESS:

A Yes, they do.

BY MR. KEMPF:

Q Now I will get back to my prior question, and my question is this:

Do the different pieces of equipment for the consumption of fuel at different facilities have different coal specifications?

MR. SIMS: That type of fuel, counsel? Is this equipment that can use any type of fuel at the facilities?

MR. KEMPF: I am referring to the facilities referred to in this exhibit, and this exhibit states on its cover it refers to FSC Class 9110—Coal.

MR. SIMS: It refers to coal supplied to the different facilities, but it doesn't discuss the equipment used in the facilities.

[12] MR. KEMPF: Mr. Nix has testified previously in his testimony—the record will show exactly the words he used—that these particular specifications, under Item No. 19, for example, relate to the equipment used at the destination.

MR. SIMS: No. He said they relate to the coal that is to be supplied by the contract.

MR. KEMPF: Yes. And when I asked him where he got them, he made it clear that it relates to the equipment in which the coal is to be consumed.

MR. SIMS: No. He said it depended on several things, and not just the equipment.

BY MR. KEMPF:

Q Mr. Nix, is the coal, referred to in this exhibit, for consumption by the facilities referred to in this exhibit?

MR. SIMS: Objection. No facilities are mentioned in the exhibit.

MR. KEMPF: I will let the question stand.

THE WITNESS: Should I answer?

MR. KEMPF: Yes. If you have forgotten the question, the Reporter will read it.

[13] THE WITNESS: Will you repeat it, please.

Q (Read by the Reporter.)

MR. SIMS: I also object as to a leading question.

THE WITNESS: If I could rephrase the question myself, I could answer it.

MR. KEMPF: Well, let me try it again, if it is confusing to you.

BY MR. KEMPF:

Q Does each item in this exhibit, such as Item 19 which we have been discussing, refer to a Veterans Ad-

ministration facility or Federal public building at which coal is consumed?

A Yes.

Q And at each of these facilities is coal consumed in a piece of equipment designed for the use of coal?

A Yes.

Q Do different pieces of equipment at different facilities have different specifications for the coal which they consume?

A Yes.

Q Can that be seen by comparing the data set forth in Item 19 with the data set forth in [14] other items?

MR. SIMS: That is a leading question, counsel.

MR. KEMPF: I ask the witness to answer the question.

Do you want me to restate the question?

THE WITNESS: Will you repeat it, please?

MR. KEMPF: Yes.

BY MR. KEMPF:

Q Can that be seen by comparing the data set forth in Item 19 with the data set forth under other items?

A Yes.

Q When you are considering possible changes in specifications for a particular facility, do you seek expert advice?

A Yes.

Q From whom do you seek that?

A The equipment manufacturer.

Q Would you ever merely drop the specifications and order coal without regard to its characteristics?

MR. SIMS: Objection as leading.

MR. KEMPF: Should I have the Reporter [15] reread the question?

THE WITNESS: I know the question, but do I answer or not?

BY THE WITNESS:

A No. We wouldn't buy coal without a specification.

MR. FUTTERMAN: Could I have that question read back, please, and the answer.

(The record was thereupon read by the Reporter as above recorded.)

MR. KEMPF: I hand the Reporter a document titled "Term Contract Ordering Data for: FSC Group 91 Fuels, FSC Class 9110—Coal, Veterans Administration Facilities and Federal Public Buildings, within the states of: Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin, effective period: July 1, 1968 through June 30, 1969," and ask the Reporter to mark this as Nix Deposition Exhibit No. 2 for identification.

(The document was thereupon marked Nix Deposition Exhibit 2 for identification, 4-14-69.)

[16] BY MR. KEMPF:

Q Mr. Nix, I hand you what has been marked as Nix Deposition Exhibit No. 2 for identification, and I ask you if you recognize it.

A Yes, I do.

Q Have I correctly described the document?

A Yes, you have.

MR. KEMPF: I ask counsel for the plaintiff whether the standing stipulation may apply to this document.

MR. SIMS: Not at this time.

BY MR. KEMPF:

Q Mr. Nix, I note that the U.S. Courthouse and Federal Building referred to as Item 19 in Nix Deposition Exhibit No. 1 is not referred to in Nix Deposition Exhibit No. 2. Why is that, Mr. Nix?

A The reason it is not shown in Exhibit No. 2 is that the boilers at the U.S. Courthouse in Chicago were converted to combination gas-oil burners, and the use of coal was discontinued.

MR. KEMPF: I have no further questions.

MR. FUTTERMAN: We would like a short recess.

MR. KEMPF: Fine.

• • • •

[3]

EXCERPT FROM DEPOSITION OF ALDO P. BRAZZALE, TAKEN APRIL 14, 1969

• • • •

ALDO P. BRAZZALE,

called as a witness by the defendants herein, having been by me, the said Frances B. Spina, as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. IRVING:

Q Please state your full name, sir.
A Aldo P. Brazzale.
Q Mr. Brazzale, what is your current home address?
A 11604 South State Street, Chicago, Illinois.
Q Are you appearing for this deposition this afternoon pursuant to a subpoena?
A Yes.
Q By whom are you employed, Mr. Brazzale?
A By the United States Government.
Q What is your office address?
A 219 South Dearborn Street, Chicago, [4] Illinois.
Q For which branch or department of the United States Government do you work?
A The General Services Administration, Public Building Service, Design and Construction Division, Design Branch.
Q Mr. Brazzale, what position do you hold in the Design and Construction Division of the Public Building Service of GSA?
A I am supervisory mechanical engineer.
Q Would you briefly describe your duties as supervisor and mechanical engineer with the Design and Construction Division?
A We are responsible for the design of mechanical systems which go into the Federal buildings in our region, Region 5.

MR. IRVING: I ask the Reporter to mark for identification, as Brazzale Deposition Exhibit 1, a document entitled "Heating Fuel Economic Analysis" for the Federal Office Building and United States Courthouse, Chicago, Illinois.

(The document was thereupon marked Brazzale Deposition [5] Exhibit 1 for identification, 4-14-69.)

BY MR. IRVING:

Q Mr. Brazzale, I am now going to hand to you Brazzale Deposition Exhibit 1 and ask you if you recognize it.

A Yes, I do.

Q Have I correctly described this document?

A The "Heating Fuel Economic Analysis," yes.

MR. IRVING: I now ask counsel for plaintiff if they will authorize that the standing stipulation with regard to documents be in effect at this time.

MR. SIMS: Not at this time.

BY MR. IRVING:

Q Was this analysis prepared under your supervision, Mr. Brazzale?

A Yes, it was.

Q For what purpose was this economic analysis prepared?

A For determining the type of fuel to use in the boilers at 219 South Dearborn.

Q By "determining the type of fuel used," could you explain that a little more fully?

[6] A By determining the type of fuel used, this came about due to the requirements which were set down by the Anti-Air Pollution Act. We received authorization to prepare a project for converting the boilers to comply with the Federal Anti-Air Pollution Act, and this analysis was the result of our study.

Q That fuel was the building using at the time the study was initiated?

A Coal.

Q Why was it necessary to undertake this study?

A To comply with the Anti-Air Pollution Act, the criteria set down in accordance with the Anti-Air Pollution Act.

Q Was the fuel the building was currently burning in compliance with that Act?

A No.

Q Did you consider low sulfur coal as an alternative fuel source?

A Yes, we did. We considered the use of anthracite; however, for this area the anthracite does not meet the criteria which has been set down.

Q By "criteria," do you mean the air pollu- [7] tion criteria?

A Yes.

Q Are the figures for anthracite coal contained in the first column, under the heading "Coal" in Brazzale Deposition Exhibit 1?

A Yes.

Q Specifically, Mr. Brazzale, what other fuel alternative did you consider and analyze?

A We considered No. 6 and interruptable gas, year-around gas, and No. 2 and interruptable gas.

Q Would these three alternatives comply with the air pollution control guide lines?

A Using desulphurized No. 6, yes, they would.

Q On the basis of this "Heating Fuel Economic Analysis," which is Brazzale Deposition Exhibit 1, what recommendation did you make?

A We recommended using desulphurized No. 6 and interruptable gas.

Q Why did you make this recommendation?

A Because the annual owning and operating cost of the alternatives considered came out to be [8] less than the other alternatives considered.

Q Mr. Brazzale, is this a standard Federal Government form used for making economic analyses of heating fuel alternatives?

A It is a standard General Services Administration form, yes.

MR. IRVING: Thank you. I have no further questions at this time.

CROSS EXAMINATION

BY MR. SIMS:

Q Mr. Brazzale, you said that you converted the boilers in this building to comply with the criteria of the Anti-Pollution Act. Did you not in fact convert these boilers to comply with an Executive Order that required all Federal installations to comply with criteria set forth in the Anti-Air Pollution Act?

A Yes.

Q Was it the Executive Order that you were following?

A Yes.

Q And this applied only to Federal Installations?

A Yes.

• • • •

EXCERPTS FROM DEPOSITION OF CLARENCE V. BECK, TAKEN APRIL 16, 1969

* * * *

CLARENCE V. BECK,

of lawful age, having been first duly sworn to testify the truth, the whole truth and nothing but the truth in the case aforesaid, deposes and says in reply to oral interrogatories propounded, as follows, to-wit:

QUESTIONS BY MR. IRVING:

Q Please state your name, sir.
A Clarence V. Beck, B-e-c-k.
Q What is your current home address?
A Well, 6012 Clemens Avenue in St. Louis.
Q Are you appearing for this deposition this afternoon pursuant to a subpoena, Mr. Beck?
A Yes.
Q What is your current occupation and position, sir?
A Well, I am President of the Little Dog Coal Company and the Florida Coal Company that have recently operated the Little Dog Mine in Gillespie, Illinois.
Q What is the business address of the Little Dog [3] Coal Company?
A The business address in St. Louis is 4479 Laclede Avenue right at the present time. We just moved.
Q How long have you been in the coal industry, Mr. Beck?
A I have been in it since June 1905. They tell me I am the oldest active member of the industry now in St. Louis.
MR. CUSACK: In St. Louis?
THE WITNESS: Yes. They jokingly refer to me as the dean of the industry.
MR. IRVING: Could you give us a brief description of the various positions you have held in the coal industry throughout the sixty plus years?
A I started in as a coal broker and after a few years I got into the mining business and I have been

in the mining business and the sales business every since about 1915.

Q Have you acquired a great deal of experience and knowledge concerning the coal industry over these years?

A I should have.

MR. FUTTERMAN: I object and move to strike that answer on the grounds the question was leading—and the answer.

MR. IRVING: Mr. Beck, how many mines does the Little Dog operate?

[4] A Little Dog—just one mine and that is the only mine that I have operated in the last fifteen years.

Q Where is this mine located, sir?

A At Gillespie, Illinois, on the Illinois Terminal Railroad.

Q Is that mine still in operation or currently in operation?

A At the present time it's not in operation because the State shut it down on account of an underground fire which led to various financial complications and it hasn't operated since, well, the 27th of November last.

Q I see, sir. Before it closed down what was the average annual production at the Little Dog Mine?

A We got out over four hundred thousand tons for the last several years prior to that time. Four hundred thousand tons a year.

Q Is that mine a strip or deep mine?

A Three hundred fifty feet deep.

Q Mr. Beck, to whom did the Little Dog sell coal?

A Well, we had—our biggest customers were the ones where we had lower transportation costs than most of the competitors. We had a contract with the Staley Manufacturing Company at Decatur for one hundred fifty thousand tons. We had a contract with the City of Springfield for their local [5] power plant that ran approximately a hundred thousand tons. Then we had a general local business in trucks that drove to the mine of thirty to forty thousand tons a year. Then we had some surplus tonnage that we distributed wherever we could.

Q Where would the customers be located for the most part?

A Well, the bulk of our coal was located—was sold more or less local to the Illinois Terminal Railroad and anything recently that we sold that wasn't on the Terminal Railroad was at their terminal docks.

Q For what purposes did these customers buy your coal?

A Well, outside of the small amount of domestic coal that we sold at the mine to the local trade, which was dwindling all the time on account of oil and gas competition, the Staley Company was the biggest individual user. That was, you might call it, industrial coal for process steam. But all the rest of it went to public utilities.

MR. FUTTERMAN: I move to strike those parts of the last answer which were not responsive to your question.

MR. IRVING: Strike that last statement. Mr. Beck, you mentioned that some of your coal went to utilities. For what purpose did they purchase the coal?

A Generally electricity.

Q Did you sell any Little Dog coal in the Peoria area?

A No.

[6] Q Why is it, sir, that you never sold coal into Peoria?

A Well, there were local mines up there in the Peoria district that had more advantageous transportation charges than we had. We had no chance to sell coal in the Peoria or Pekin, or that general manufacturing district.

MR. FUTTERMAN: Just a minute, please. Read the answer.

(Answer read by reporter)

MR. IRVING: Mr. Beck, was coal from Peoria sold into the Springfield and Decatur areas?

A I never heard of any.

Q Why is that so?

A Well, that was for the same reason we couldn't reach Peoria, their transportation charges were higher than ours and the rail rates didn't—weren't conducive to shipments and they were too far to truck.

Q To Decatur or Springfield in that area?

A Yes.

Q Have you ever sold any coal in an area such as Joppa, Illinois, Indiana or western Kentucky?

A No. They're out of our geographical area altogether.

Q Why is that, sir?

A Well, our freight rates down there, I don't even know what they are, but they would prohibitive because we would [7] have to cross a lot of other coal fields that are much closer.

Q Are the availability of transportation facilities and location of mines significant factors in determining where a mine can successfully sell its coal?

MR. FUTTERMAN: Object. That question is leading. Please explain also what you mean by "significant," if you choose to use that word in your question.

MR. IRVING: Mr. Beck, do you understand what I mean by the word "significant"?

A I think so.

Q Then please answer the question.

MR. FUTTERMAN: Same objection.

MR. IRVING: Will you like to have the question restated?

A My answer to that would be that coal sales follow transportation arteries and freight rates—now, you asked about Joppa. For instance, Joppa is in the southern end of the State of Illinois and we are in the central part, nearly three hundred miles down there, it's two hundred odd, and there are mines down there in Southern Illinois that cater to that business and have freight rates that are more than a dollar a ton cheaper than we would have. So there would be no chance for us to sell down there.

Q Did the Little Dog sell any of its coal by contract.

[8] A Yes. Yes.

Q To whom? What type of customers did you—

A We had a contract with the Staley Manufacturing Company. We had a contract with the City of Springfield for their local power plant. That is at the time the mine was shut down. Prior to that time we had had contracts with, well, Union Electric at Venice, Illinois Power Company at their federal power plant.

Q Generally how long in duration were these contracts Mr. Beck?

A Well, from one to five years. Five was the maximum. Most of them were one year.

Q Did the Little Dog ever sell any longer term contracts, say ten to twenty years in duration?

A No.

Q Why was that, sir?

A Well, that seems to be a sort of a different business. These people that buy for long-time prediction generally tie up with the big operators that have large reserves.

Q Does coal face competition from other fields like gas or oil?

A Well, it's the—competition from gas and oil is terrific. The fact is oil indirectly, the diesel locomotives, has taken the railroad business and the gas has taken nearly all of the so-called household and smaller business and a considerable amount of the larger business, [9] for instance the gas people are out soliciting big users all the time and they have dump contracts with all of the utilities that take large quantities of gas in the summertime.

Q You testified earlier, Mr. Beck, that you sold some coal to the Venice plant of Union Electric?

A Yes.

Q Did Little Dog sell to any other Union Electric plant?

A No. That was the only one we had advantageous transportation rates to.

Q Are you familiar with the recently enacted St. Louis Air Pollution Orinance, sir?

A Yes.

Q Has that had an effect on your Venice business?

MR. FUTTERMAN: Object. Leading question.

THE WITNESS: It happened to be that we lost that business right after the Air Pollution Ordinance went into effect on account of the fact that our coal was higher sulphur coal than permitted.

MR. FUTTERMAN: I move to strike those parts of Mr. Beck's last answer which were not responsive to your question.

MR. IRVING: Mr. Beck, did the fact United Electric and Freeman were both controlled by General Dynamics have any adverse effect on the Little Dog Coal Company?

A I couldn't see any.

Q Why is that, sir?

A Well, while we were [10] competitive to the Crown Mine of Freeman we weren't directly competitive to United Electric at any place that I knew. They sold their coal mainly in different places than we did on account of the location of their properties and the transportation costs—the cost to the consumer and so forth. They didn't sell any customers that we directly competed for.

MR. IRVING: I will ask the reporter to mark for identification purposes as Beck Deposition Exhibit 1 a letter dated November 14, 1968, from Mr. C. V. Beck to the Antitrust Division, Department of Justice, Chicago, Illinois.

(Beck Deposition Exhibit 1 marked 4-16-69 TAG for identification)

MR. IRVING: Mr. Beck, I now hand you what has been marked Beck Deposition Exhibit 1 and ask you if you recognize this?

A Yes. That is the letter I wrote.

Q Have I correctly described it, sir?

A Yes.

MR. IRVING: I now ask counsel for Plaintiff if the standing stipulation will apply to this document?

MR. FUTTERMAN: Not at this time.

MR. IRVING: Mr. Beck, would the continued ownership of United Electric and Freeman by General Dynamics have any adverse effect on Little Dog Coal Company?

[11] A Not that I could see, no.

MR. FUTTERMAN: Move to strike the question and answer on the grounds of United States versus Philadelphia National Bank.

MR. IRVING: Would there be any benefit to competition in the coal industry if Freeman and United Electric were required to operate independently of each other?

MR. FUTTERMAN: Object as leading.

THE WITNESS: I can't see any.

MR. IRVING: Would the continued ownership of both Freeman and United Electric have any adverse effect on competition in the coal industry?

MR. FUTTERMAN: Object. Leading. I suggest you ask your questions in such a manner that they are not leading.

MR. IRVING: Please answer the question.

A I don't think so.

MR. IRVING: I have no further questions at this time.

* * * *

[17] Q Would you estimate that in 1968 you sold about twenty or twenty-five thousand tons of coal to Commonwealth Edison?

A I would say that.

Q Mr. Beck, isn't it a fact that United Electric and Freeman sell coal to the river generating stations of Commonwealth Edison?

A Oh, yes.

Q Are Freeman and United Electric in competition for that business?

MR. IRVING: Object. Counselor's question is outside the scope of the direct examination.

MR. CUSACK: It is not.

MR. KEMPF: The Court will rule on it and you won't.

MR. CUSACK: Your remarks are uncalled for.

MR. KEMPF: As yours are. Immediately before we went on the record you indicated you hoped that only one counsel from each side would make remarks throughout this deposition. You have interjected remarks which are, in my view, uncalled for.

MR. CUSACK: Why are you talking then?

MR. KEMPF: To get the record straight in that regard.

MR. FUTTERMAN: Would you answer the question, if you recall it? Do you recall my question?

A Oh, yes.

[18] Q Would you answer it, please?

A It's a well known fact that the Crown Mine of the Freeman Coal Company have a contract which takes the bulk of their output with the Edison Company and have, ever since the mine was sunk. That, I believe, goes mostly by the Havana Dock of the C&IM Railroad at the present time, at least. The C&IM of course belongs to the Edison Company and that mine, I have understood, sells about two million tons a year to the Edison Company along with about five million tons of coal that comes from the Peabody No. 10 Mine in the same district. That probably is fifty percent of their take. As far as the United Electric is concerned it's common knowledge that their Peoria District, which is very favorably located to the river, sells a considerable amount, I don't know how much, but nothing like as much coal as the Edison Company, along with all the operators in the Peoria District have some tonnage going into the Edison Company.

MR. IRVING: I move to strike the answer on the grounds it's hearsay. If Plaintiff desires to ask questions concerning Freeman and UEC Coal Company and the Peabody Coal Company, the best person to ask are the coal companies and if they have questions concerning Commonwealth Edison they should properly direct the question to Commonwealth Edison.

MR. FUTTERMAN: Mr. Beck, do you know of your [19] own knowledge that Freeman and United Electric and Peabody sell coal to the Commonwealth Edison Company?

A Well, I know that Peabody and the Crown Mine sell it to them. I understand on pretty good authority that the other—all the Peoria operators district sell some coal to the Edison Company.

Q Mr. Beck, isn't it common knowledge that United Electric sells coal to Commonwealth Edison?

A Well, I think it is, yes.

Q Mr. Beck, isn't it a fact that you sold coal to Northern States Power Company in Minnesota?

A I sold them a few barges, yes. That was complimentary tonnage, spot orders just here or there. We never had a definite contract with them.

Q What was the greatest number of tons that you sold to Northern States Power Company in any one year?

A Well, let me think. I would say twenty odd thousand tons.

Q How many tons did you sell to Northern States Power Company in 1968, approximately?

A We sold them just two or three barges because we were down all summer long.

Q How many tons of coal would that be?

A A barge holds thirteen hundred tons generally.

* * * *

[21] Based on your knowledge and experience in the coal industry isn't United Electric one of the substantial coal producers in Illinois?

MR. IRVING: Object. I find that a leading question. Once again you have to define what "substantial" means in this case. We haven't any definition whatsoever.

MR. FUTTERMAN: Answer the question, please.

A They produce several million tons a year. I don't know if—I would give the opinion that the joint properties produce something like four million tons.

Q I am speaking of United Electric alone.

A That's what I'm talking about. That makes them a substantial producer in my opinion.

Q Mr. Beck, are you surprised to learn that the combined production of Freeman and United Electric is in excess of ten million tons?

A No, I'm not surprised. I guess that is pretty close to the figures. It's probably eleven. I don't know if I could pick it out of the air.

Q That would make the two companies combines very substantial producers and independently very substantial producers, would it not?

A Yes. They would be substantial producers.

• • • •

[24] Q Thank you, Mr. Beck. Isn't it a fact, and don't you [25] know it to be a fact that strip coal companies are now removing coal below one hundred fifteen feet of overburden?

MR. IRVING: Object both as outside the scope of the direct examination and concerning questions better asked of strip miners, and based on hearsay testimony in this case.

MR. FUTTERMAN: Would you answer the question, please, sir?

A Well, I read in the trade papers that they are in certain places in the country. I don't know that they're doing that in Illinois as yet.

Q Based on your knowledge and experience in the coal industry do you expect that they will be stripping below the depth of one hundred fifteen feet in Illinois in the near future?

MR. IRVING: Objection. I have a continuing objection to this line of inquiry.

MR. FUTTERMAN: Would you answer the question?

A Well, that's a moot question, difficult to answer. Underground mining methods and machinery are improving so fast that it's just a question now as to whether it's cheaper to go that deep or not. It's possible. Personally I have an idea that underground methods now have improved so much it would be more economical to have an underground mine and a depth greater than one hundred fifteen feet.

• • • •

[27] A In the last, I'll say twenty years, the method of mining underground coal has changed considerably

in the matter [28] of what they call roof bolting and that is where you bolt the roof of the mine, which may be a poor roof, to some rock strata that lays above it, maybe you have to go up to maybe four to ten or twelve feet. That eliminates the necessity for a tremendous amount of wooden props in the mine and it, I would say, enables you to mine poorer condition coal than you would otherwise find it profitable to mine.

Q Is it not a fact that Mr. Kraakevik of the Illinois Power Company told you that he cannot fulfill coal requirements for his Havana plant from Fulton-Peoria coal?

MR. IRVING: Objection.

MR. FUTTERMAN: I would like to state for the record that the Government objects to the continuing harassment of its cross-examination of Mr. Beck.

MR. IRVING: Counsel for Plaintiff has continually gone into areas outside the scope of my direct examination. I ask counsel to desist, however I ask him if he would like to make Mr. Beck his witness at this time.

MR. FUTTERMAN: No. Mr. Beck has been subpoenaed to testify by you, Counsel, and I would like to state this question is not outside the scope of your direct examination nor are the other ones.

MR. IRVING: I'm not going to argue with counsel for Plaintiff on this matter, it's clearly an issue for the Judge [29] to decide, not for us.

MR. FUTTERMAN: All right. Mr. Beck, do you have my last question?

A Yes.

Q Would you answer it, please?

A Well, I will state first that Mr. Kraakevik didn't make that remark to me personally, he made it to my agent, Mr. Coffee. We had been very closely associated with the Illinois Power Company over many years. We had contracts with them for their federal plant here on the Mississippi, we had one five-year contract with them for one hundred fifty thousand tons a year and—but we never had any business regularly from this Havana Plant. We never had any. I understand that originally that—that is the oldest plant the Illinois

Power Company has and it's an Illinois River plant and they had unloading facilities on the Illinois River which they tore out for some reason or other and for the last few years they have been getting coal directly from the Peoria District by truck and those lines there are right across the river. I think there were several of them within, I'll say, twenty miles of the plant. I understand now that they're having difficulty getting supplies from the Peoria District which is a dying district when you come down to it, and they're well sold up all the time and Mr. Kraakevik advised our—my agent that he would be receptive to a [30] proposition to supply that coal from our mine on rail.

Q Isn't it a fact, Mr. Beck, that Mr. Kraakevik told your agent that he would be willing to take Little Dog's entire output for the Havana plant should Little Dog reopen?

A He indicated he would be interested in taking four hundred thousand tons, which is substantially the output.

Q Mr. Beck, is it not a fact that Commonwealth Edison's new plant, Powerton Plant at Pekin, Illinois, will be supplied coal from Humble Oil's new mine near Gillespie, Illinois?

MR. IRVING: Objection. I find that question outside the scope of the direct examination.

MR. FUTTERMAN: I disagree. Would you answer the question, Mr. Beck?

MR. IRVING: It also calls for a hearsay answer.

THE WITNESS: Well, that is published information, yes, that they're sinking a new mine six or seven miles northwest of our mine. It will be a combination rate proposition between the Chicago-Northwestern, the Illinois Terminal, the C&IM, that they will supply coal from that mine to Powerton.

Q It is a fact, then, is it not, Mr. Beck, that Central Illinois Coal will then be moving into the Fulton-Peoria coal district?

MR. IRVING: Objection, same grounds.

THE WITNESS: Well, it's my opinion that it will do [31] some more in the future for two reasons. In the

first place, all of the power companies are increasing rapidly their consumption of coal. They tell you that their load increases eight percent a year and it doubles every ten years. That's about eight percent compounded. Naturally with a large string of power plants along the Illinois River and in the territory, say, at Rockford and Davenport and Madison, Wisconsin and so forth, if their demand for coal doubles in the next ten years from the public utilities Peoria District is a dying coal field, they have about got every pound of coal or acre of coal corraled up there, that the strip mines can ever strip. Consequently the tonnage is actually going down in that field, which, in fact, as a strip area it's a new one. United Electric's Cuba strip was the first one, that's about thirty years old, and all of a sudden they found it was a very favorable stripping area and it is all strip coal now.

Formerly, that coal originally came from the Springfield District of Illinois, Central Illinois, what we are in. If the demand increases and the supply dwindles in Peoria the next people to come—they'll come down to the Springfield area to get the coal some of these days, we hope.

Q Mr. Beck, you supply coal to Union Electric Company's generating station at Venice, Illinois, did you not?

A Yes.

[32] Q Where is Venice located?

A Venice is right across the river here about two miles north of this building.

Q That's practically in downtown St. Louis, is it not?

A Yes, right across the river. It's on the East Side.

Q How many tons did you supply the Venice plant in 1964?

A We had a contract with them for several years, up until 1968, for a hundred thousand tons a year.

Q Who were your competitors for the business of Union Electric's Venice plant?

A Well, the main competitors were Southern Illinois Coal, Freeman Coal Company, Orient Coal was in there. Sahara Coal Company from Saline County was in there.

In fact, that was the one plant of Union Electric that seemed to be an open market plant. They bought that coal on a year-to-year basis, there were no long-term contracts to Venice. That I know of. And there was—we were, I believe, the only Central or Belleville District operator that ever put substantial amount of coal in there recently. The rest of it was what I would call Southern Illinois dust.

Q Now, isn't it a fact that United Electric supplied coal to the Venice plant at Union Electric?

MR. IRVING: Objection.

THE WITNESS: I don't think they did. I never heard [33] of any.

MR. FUTTERMAN: Would you be surprised to learn that United Electric did supply coal to the Venice Plant of Union Electric?

A I wouldn't be surprised. Anybody could ship in there from the Belleville District. They might have shipped some coal in there.

MR. FUTTERMAN: Will counsel stipulate that United Electric has supplied coal to the Venice Plant for Union Electric?

MR. KEMPF: Not at this time.

MR. IRVING: I wish to withdraw my last objection.

MR. FUTTERMAN: Mr. Beck, other than the electric utility generating stations that you have already mentioned, have you supplied coal to any other electric utility generating stations during the past twenty years?

A I don't recollect we furnished anybody other than that that have been mentioned.

Q During the last twenty years, Mr. Beck, did any of your coal move into the Fulton-Peoria District?

MR. IRVING: Objection. Strike that.

MR. FUTTERMAN: You can answer the question now, please.

A I don't know of any, no.

* * * *

[35] Q Mr. Beck, when you were talking about the East Side you were referring to the East Side of St. Louis, is that correct?

A Well, yes. You take the cost is, generally speaking, twenty-five cents a ton higher freight rates to St. Louis. The fact is they changed the freight rate so quick and so many times recently it's hard to keep track of them. Generally speaking, it costs somewhere in the neighborhood of twenty-five cents a [36] ton more from a freight standpoint to St. Louis than the East Side and of course on a truck basis it's a little further to St. Louis than it is to East St. Louis, although practically all of the industrial coal used in the St. Louis area is trucked in here because the truck can run it in here cheaper than the railroads.

Q Mr. Beck, isn't it a fact that the dump or interruptable gas sold by the gas company during the summertime is drying up, to utilities?

A Well, I would say generally speaking that is partly true, yes. It's not as bad as it was five years ago or ten years ago.

Q Isn't that because the gas companies are now storing that gas for use during the wintertime when they can get a higher price for it?

MR. IRVING: Objection. Once again counsel for Plaintiff is calling for hearsay testimony. You have questions concerning the policies of the gas industry I suggest you ask members of the gas industry.

MR. FUTTERMAN: Would you please answer the question now, Mr. Beck?

A Well, it's my opinion that that is a factor. On the other hand, they are—can more easily now—they have more plants—they can dump gas into more than they had [37] originally and they can be a little more selective in their choosing who is going to get the dump gas than they used to be. Between the two factors the dump gas isn't quite the problem it was five years ago or more.

Q Isn't it a fact that the amount of dump gas going to utilities has substantially declined over the last five years?

A I am not sure whether the gas has declined or the utilities' consumption has increased. It isn't quite, apparently, as big a percentage. You can look in the

book and find it out easily by going through the statistics from the Federal Power Commission.

Q Mr. Beck, isn't it a fact that the operations at the Venice Plant of Union Electric Company have been curtailed due to its proximity to the downtown St. Louis area?

A I doubt that. I think that they have been curtailed somewhat on account of the fact it's an older plant and the newer plants, particularly Meramec and Portage are more efficient and they favor those plants when they can. But Venice runs continuously and is a substantial plant. They can burn a hunrded cars of coal a day. I think that they—I have never known they didn't burn forty and fifty and I have been over there many times when they're unloading coal and nearly all the coal that I ever saw over there besides mine was either from Old Ben, Freeman or Sahara. It was all Southern Illinois dust.

[38] Q Mr. Beck, did you ever know of any United Electric coal going into the Venice plant of Union Electric?

A Not of my positive knowledge. I never saw any. The fact is I never heard any went in there. It's possible, anybody could put it into Venice. They bought on the open market and everybody but me had the same freight rate.

Q Mr. Beck, isn't it a fact prior to the fire in your mine you could sell all of the coal that you produced?

A Well, we are very favorably located, we didn't run full all the time, but we have for the last several years.

Q Isn't it a fact that your operations were profitable prior to the mine fire?

A Well, they were profitable up till the last several years. The last several years we were in the reconstruction period and we had some financial troubles that—

Q Mr. Beck, in your opinion is there a place in the coal business for the medium-sized producer such as Little Dog?

A He has to be well located and pretty smart, but there is if he is well located. If he is poorly located there isn't any.

Q Were you the last of the medium-sized producers in Illinois?

A Well, from the standpoint of one company, perhaps almost. There is companies that have been going in Southern Illinois that are slightly smaller than I [39] am that seem to be successful. They cater to entirely different markets. Certain companies have individual mines that seem to get along well. I might mention that Bellenzoller's Murdock Mine is probably one of the most profitable mines in the State of Illinois and it's an orphan, way out in the northeast of us, east of Decatur. It's a peculiar situation. The coal trade is peculiar inasmuch as location and transportation charges mean everything.

MR. FUTTERMAN: The Government has no further questions at this time, and thank you, Mr. Beck.

MR. KEMPF: Counsel for the Defendants would like to take a short recess.

MR. FUTTERMAN: I think Mr. Beck would probably appreciate that.

(At this time a recess was had)

QUESTIONS BY MR. IRVING:

Q Mr. Beck, in your sixty years in the coal industry have you ever operated a strip mine?

A No.

Q Do you consider yourself to be an experienced strip miner?

A No.

Q Do you consider yourself an expert on strip mining?

A No.

• • • •

[2]

EXCERPTS FROM DEPOSITION OF WINFORD C. PETERSON, TAKEN APRIL 18, 1969

* * * *

WINFORD C. PETERSON,

called as a witness by the defendants, being first duly sworn by the Notary Public (Richard Kaufman), and stating his address as 373 Stanwich Road Greenwich, Connecticut 06830, testified as follows:

EXAMINATION BY MR. KEMPF:

Q Will you please state your name?

[3] A Winford C. Peterson.

Q What is your home address?

A 373 Stanwich Road, Greenwich, Connecticut.

Q Are you appearing for your deposition this morning pursuant to subpoena, Mr. Peterson?

A I am.

Q Could you please tell us by whom you are employed?

A I am employed by National Oil Fuel Institute which is commonly known as NOFI.

Q What is your business address?

A We are located at 60 East 42nd Street, New York.

Q What is your present position with the National Oil Fuel Institute?

A I am the president.

Q How long have you been in the oil industry, sir?

A My father died in 1933 and I came home out of college that night and took over the family business as a jobber and I operated that business from 1933 into 1941 at which time I became a commission agent for the Standard Oil Company of Nebraska and I was in that work for a period of time until World War II came along and I went into World War II for about three years and when I [4] came back I was called back to Omaha, the headquarters for the Standard Division, which in the meantime Standard of Nebraska had been bought out by Standard of Indiana while I was away to the Army, so

I came into the headquarters working as their special representative for training and then I went through a series of jobs touring through the company, roughly two to three years on each position until the Korean War came along and I went back to Korea from 1960 to 1962, for about almost two years.

Q You said 1960 to 1962?

A 1950 to 1952.

After that I came back for a short period of time in the Omaha office as the sales manager for the State of Nebraska in the consumer end of the business which includes bulk plant and tank wagon operations, fuel oil, gasoline, farm products, primarily.

I went to the Chicago general office and again I went through a progression of positions there until just this last year I was invited to become the president of NOFI and I accepted that position and came here to New York.

Q When was NOFI founded, Mr. Peterson?

A It was founded in 1961 by a merger of the National [5] Fuel Oil Council and the Oil Heat Institute of America.

Q Approximately how many NOFI members are there?

A NOFI is a troika. It consists of three divisions. There are 7000, roughly 7000 dealer-distributors or jobbers. There are 20 refining oil companies in the Refining Division and there are 80 burner equipment or controls equipment people in the Equipment Division. That is the size of the membership.

MR. GRUBERG: It is called the Manufacturers Division?

THE WITNESS: Yes, our Manufacturers Division.

Q How many states does the NOFI Distributor and Dealer Division operate in?

A We operate in 26 states which are basically the East Coast states and the Midwest.

Q What is the daily average total distillate heating sales volume in the 26 areas that the NOFI members serve?

A 1.3 million barrels a day. • • •

Q And what per cent of that volume are NOFI members selling and servicing?

A About 70 per cent.

[6] Q What sort of functions does NOFI perform?

A NOFI is dedicated to the proposition of developing oil growth services for its members, the growth of oil in the energy market.

Q In what various forms or how is this effected?

A Well, we have advertising and promotion. We devote ourselves to the research and development, equipment research and development, educational programs, PR, government liaison and technical services.

Q What has been the approximate size of NOFI's budget in recent years?

A About $5 million a year.

Q Are the States of Illinois, Indiana, Iowa, Wisconsin and Minnesota included in the 26 states where NOFI operates?

A They are.

Q What is the overall objective of the oil market growth services which NOFI performs for its members?

A Well, our objective, of course, is to increase the oil share of the energy market.

Q Does oil compete with other fuels such as gas, coal, nuclear fuel for the business of utility companies?

MR. EISEN: That is objected to. It is leading and suggesting an answer to the witness.

[8] MR. KEMPF: There is no suggestion at all. I am asking him for the answer and he has a number of options.

MR. EISEN: You mean—

MR. KEMPF: He has a range of answers that can be totally inconsistent. He can say yes or no.

MR. EISEN: There is a range of answers from yes to no, I suggest.

MR. KEMPF: Or if the witness wishes to expand, I certainly hope he will do so.

I will restate the question at this time since we engaged in a soliloquy, not a soliloquy, a dialogue.

BY MR. KEMPF:

Q Does oil compete with other fuels such as gas, coal and nuclear fuel for the business of electric utility companies?

MR. EISEN: I will object to that question. It is not specific. It calls for an opinion and conclusion of the witness. There is no indication whatsoever—there is no proper foundation which has been laid for that question and further I would suggest that you ask him for facts rather than conclusions.

MR. KEMPF: That is precisely what I am [9] doing.

Q You may answer the question, Mr. Peterson.

A Yes, it does compete, and it varies, of course, in different areas. In New England Oil has 50 per cent of the business of the electric utilities.

Q What about electric company utility business in the Midwest?

A Well, they don't do so well in the Midwest. Coal and gas have most of that business. However, that is at the present time and that has varied over a period of years and probably could vary again.

It is important to know that most all utilities have dual or triple fuel capabilities and this is a device they use to be sure they play one energy source against the other to keep their costs for fuel low.

Q Approximately how much oil is sold to midwestern utilities each year at the present time?

MR. EISEN: I will object to that question. There is nothing indicated by this witness' prior testimony that he can answer that question.

There are documents in industry sources which are the best evidence with regard to oil consumption by utilities in the Midwest.

[10] Furthermore, there is no delineation of the term Midwest in your question, at least not which I would understand.

MR. KEMPF: If counsel will review the record upon receiving it, I think he will find by examining Mr. Peterson's testimony up to this point in the deposition, that he is emminently well qualified based on a lifetime of expe-

rience in this industry to answer this question and I ask him to do so at this time.

A Well, obviously when I knew I was going to have to make a deposition I rechecked my experience and at the present time it is about a million barrels a year that goes to electric utilities in the Midwest.

Q About what per cent of that is solely utilities located in Illinois?

A About a fourth of it.

Q Does oil compete with coal for the industrial and commercial market in the Midwest, Mr. Peterson?

A In that area, the competition is more intense. Oil has about 20 per cent of that market. Coal has about 35 per cent and gas has practically all the rest.

Q Does oil compete with coal and other fuels for the apartment and home heating market in the Midwest?

[11] A It is even more intense here. Yes, it certainly does.

Gas has over 50 percent of that business and oil has about 30 per cent.

Coal has about 10 per cent and electricity has only 2 per cent in the Midwest. It is by far the fastest growing and the biggest threat to me as an oil man.

Q Do NOFI's midwestern members attempt to persuade consumers presently using coal for heating purposes to convert to oil?

A They certainly do. Frankly that has been the easiest target for them, their success in converting coal users to oil is probably responsible for the present level of oil penetration in this market.

Q Does NOFI expect competition between coal and oil to continue in the years ahead?

MR. EISEN: That is objectionable as leading, suggesting an answer and further at this time I will move to strike all testimony of this witness with regard to statistics and with regard to characterization of competition as not being the best evidence.

Q You may answer the question, Mr. Peterson.

[12] A Would you repeat it?

Q Does NOFI expect competition between coal and oil to continue in the years ahead?

A I think that is obvious. We certainly do. Although, based on what my opinion is and what I also read in other publications, I would give it about somewhere between five and ten years, coal as a viable competitor in that direct market, but I think oil and gas will have completed most of the conversion from coal in that particular market in that period of time.

However, coal will continue to be a very tough competitor since that is the basic source for electricity, the secondary thing. You have energy by wire, so coal will be very much a competitor but in a secondary form.

Q How do you account for this, Mr. Peterson?

A Well, the electric industry has two primary targets for expansion. One is the home heat market and the other is the transportation field.

It is my personal opinion that they really can't get into the nuclear ring until they develop much greater loads within the geographical area where they have franchise status as the average home uses 5000 kilowatts a year for illumination and typical appliances, but if they go home heat, they quintuple their load, it [13] goes to 25,000.

It is important to them, if they are going to expand, if they are going to take advantage of nuclear energy since they are restricted by geographical boundaries, that they get this load and, of course, they are looking for cheaper fuel costs via nuclear fuel, but they have to have the load in order to justify it.

I think that you are going to see a tremendous effort on the part of the electric utilities to capture this home heat market and to expand their efforts.

Right now if you are from Chicago and most cities, Commonwealth Edison out there almost any night you turn on the television set, you would see commercials from these people and one of the themes and unfortunately it is a pretty tough theme, they are saying electricity is the only fuel that will be as modern when you pay off your mortgage as it is today.

They are going to be real tough in this business. That is their immediate area of expansion. They have to get that under their belt before they can invade the transportation market.

Q How are the electric utilities able to devote the resources to promoting home heating by electricity, Mr. Peterson?

[14] A They spend about $500 million a year combined in promotion and advertising and this is made possible by a Supreme Court ruling which was handed down some time ago which said that promotional expenditures up to 3 per cent a year were justified in the best long-range interest of the ultimate consumer.

By that they said line economies resulting from an expansion of the market and by development of new burning equipment, while it might cost the consumer more today, eventually would cause an economy in the fuel and are justified.

Further, under regulatory law, they are permitted to grind these $500 million each year back into the rates.

My group resists because here is a case where they are using monopoly status, the illumination area which carries part of this $500 million load, to generate funds to invade a non-monopoly area where they are in competition with us for heating oil and these kind of things and our position is this is immoral and illegal.

MR. EISEN: At this point—I have no quarrel with the witness' description of what his position has been and is and possibly we can even [15] stipulate there is this war going on between the electric utilities and the oil industry, but I fail to see the relevance of that kind of thing to this case and I object to it for the reason it encumbers the record in this case and it is a different level of distribution entirely from the one that is involved in the complaint.

MR. KEMPF: That, of course, the judge will rule on. He will also rule on the impact that this may have on the matters raised by the issue filed by the Department of Justice in its complaint.

Q Mr. Peterson, have the electric utilities succeeded in capturing a large share of the home heating market?—

A They haven't yet, but again, you need to always look at shares with the understanding what is here today may not be here tomorrow and definitely wasn't here yesterday.

They have, as I said before in the Midwest only about 2 per cent of the market presently but they are the fastest growing and as you look at the curves and you look at what is happening, our feeling is that they are the No. 1 problem that the oil industry has to face and we are going to have to do something to counter the [16] things they are doing so successfuly and really we feel the use of the utility subsidy thing, really buys the business and until we can stop that and until we can get the choice of fuel based on just the pure economics of the fuel itself, that we are going to have real trouble, but once we can get that done and remove that as an exclusive weapon so it is available for us to meet, then when that happens and the consumer must decide just on the economic merits of the fuel, then oil will improve radically and electricity won't make the goals they are projecting now.

Q Will the prices which the electric utilities must pay for their fuel requirements affect their ability to continue to expand the electricity share of the home heating market?

MR. EISEN: I would like that question.

(The question was read.)

A That seems obvious to me and it is pretty basic to the business. The cheaper their source fuel, the more competitive. The higher, the less competitive it will be.

Q Does NOFI have any programs planned that will make oil more competitive in the future?

A That is the real reason why I came to this job. [17] Booze, Allen & Hamilton—

MR. EISEN: That question is not clear to me. Competitive in sales to utilities or sales to consumers or to whom?

MR. KEMPF: This particular question I am focusing on the area we have just been talking about and that is the home heating market.

Q Did you understand the question to be referring to that?

A Would you please repeat it?

Q Does NOFI have any programs planned that will make oil more competitive for the home heating market in the future?

MR. EISEN: Competitive with what?

MR. KEMPF: With the other fuels that Mr. Peterson has been testifying about.

MR. EISEN: You mean like electricity?

MR. KEMPF: Yes.

A Electricity and gas and coal, although coal is a small part of our problem now. We think we are going to phase coal out from the rest of the fuels before too long.

Booze, Allen & Hamilton made a study of the needs [18] of the oil industry then they brought me in as president to implement that plan and we have done our own planning and this has resulted in the 80 million program; as it is commonly known as, and this is a program designed specifically at changing oil's share of the energy market and to make us much more competitive against all forms of competing energy sources particularly for the home heat market.

Q Will a portion of these expenditures you have referred to as the $80 million plan be allocated to advertising?

A Yes. We retained a national advertising agency, NOFI prior to this time, presently, does not have a national campaign and we need it badly because we feel that oil's image has been made for it by the huge expenditures of the utilities, both the gas people and the electric people, and we started that work by commissioning Jack Tinker and partners, our new national agency, to make a study of the 26 states on a county-by-county basis and to determine what level we need to reverse this trend.

Q Approximately how much do you anticipate allocating to advertising?

A Well, based on their advice to us, at a $21 million a year level, oil heat would have the loudest [19] voice

of any brand in the 26 states and since we have to turn the boat around and overcome inertia, that is what I am recommending and that is what we are striving to get that level to begin with.

Q What leads you to believe that these advertising programs will be successful?

A We have had experience, probably the most outstanding is what happened in Nassau and Suffolk County in nearby Long Island.

During the period, five-year period prior to 1961 when NOFI was formed, utilities moved in there and during that period they got 62 per cent of all the new homes, utility fuels. This was a former stronghold of oil heat.

NOFI was formed in 1961 and the Long Island group is a very aggressive group and participated with a vital advertising program and during that next five years, they reversed that trend. In fact, the utilities dropped from 62 per cent of the new home starts to 25 per cent and, as a matter of fact, during those five years, this is the last five years after the NOFI advertising program which was so effective while in operation, oil captured 120,000 homes and during that same period, the utilities captured only 28,000. I think that is very significant.

[20] Q Will a portion of the $80 million be devoted to research and development?

A Yes, it will.

Q Approximately how much?

A Well, we have needs for a lot more money but from a practical standpoint, we don't know how to gear up in the first year or two to spend more than one or two million a year. We check with the gas people. They are spending about $10 million a year for two objectives, on R&D. One is to improve their burning equipment and the other is to find new uses for gas.

When we go to the electric people it is more difficult because of the inter-action of the budgets of Westinghouse and General Electric, but our best estimate is they may be spending in the area of $40 million a year on these same things. We are going to do a lot of work, we have to.

Q What sort of things do you hope to develop?

A Well, one of the things that we want to develop are sophisticated central systems, for example, in a mobile home park and in whole new housing developments, we would set up centralized storage with pipelines running right into the basement of the home owner. Instead of having a tank there we would have a meter. We would [21] take a page out of the gas and electric people's books. That is one of the things we would do.

We have a lot of work to do on what is known as total energy plants. In big installations there are economic incentives for having a totally oil powered facility which generates its own electricity, which provides heat, which provides the cooling. Since the capital requirements are great, it is impractical for any individual company or any individual dealer to finance these things because under the free enterprise system that oil operates under, they can spend all this money to kind of build a nest and there is no assurance they will lay the eggs in it, anybody else could come in and do it.

As an association, our goal is to save these units for oil and to get oil equipment installed and then anybody, of course, it is just another oil using unit and free enterprise works and anybody can come in and deliver there.

We also need to do some things to improve burners and obsolete heating plants.

We have 11 million homes heated by oil right now in America and a lot of those burners are pretty old. We need to develop new snap-in burners which require less maintenance. It can be fixed in central depots. [22] We can probably set up subsidiary companies, these are the things we are working on, looking at, to loan and finance developments which make burners available and tanks available on a loan basis to dealers.

Those are the general dimensions. There are many other areas that we need to get into.

As you know, we now have prototypes in the field of oil-fired air conditioners and that is going to be a very important market down the road.

Q How will the balance of the $80 million be allocated?

A Well, the biggest amount that will be spent, we are hoping to counter the devastating results of the utility subsidy, that is the biggest part of that.

We envision it might work something like this, that a dealer right now who runs into a stone wall when he generally contacts builders in an area where the utilities are real active and that is in most of the areas, runs up against subsidies generally in the order of 15 cents a square foot to the builder.

We had hoped that NOFI, and it doesn't have to be a NOFI dealer, again our objective is to save the unit for oil because once it's gone to utility fuel, for all intents and purposes it's gone forever, you can't [23] recapture it the next day.

What we would envision would be to put our men in a position like this, he meets his neighbor and friend in the city and says, "Joe, you are building 25 homes, I belong to the same church or same lodge and our kids go to the same school, we belong to the same PTA and I would like to have you put oil heat in those homes."

And he says, "Well, I like you but I just really can't afford to do it because of the utility subsidies," and we would like to encourage this oil dealer to say "Yes, but something new has happened. NOFI's $80 million program has made it possible for me to meet whatever utility subsidy you are getting and all I need is evidence, it could be an affidavit or detail which is sworn to so we can definitely equal the offer and NOFI will give me matching funds which will permit me to get in and compete."

That is what the bulk of the money is envisioned for and the other is the financing and loaning of money to handle these large capital requirements to get into and expand the central distribution system and total energy markets and these kind of things.

Q Have you had any experience which would lead you to believe that these promotional type expenditures would [24] be successful?

A Well, the Pacific Northwest region have actually had programs not quite like the one I am envisioning, but where they have actually furnished funds for their deal-

ers to counter utility subsidies and to bring the cost of oil-fired equipment in line with the cost of gas-fired equipment and it has been successful.

Q Do you think that air pollution legislation will have an effect on inter-fuel competition?

MR. EISEN: I would like to make an objection to that. I don't think the witness is qualified in any way as an expert in air pollution and I don't think your questions have so established him as being qualified by knowledge, experience, education or otherwise as being an expert on air pollution.

MR. KEMPF: I am not, of course, attempting to indicate that Mr. Peterson is an expert on air pollution. One, however, does not need to be an expert on air pollution to recognize that legislation in that field may have an effect on his business and I am asking him if it will and if so, to what extent.

Perhaps I better restate the question.

[25] BY MR. KEMPF:

Q Mr. Peterson, do you think that air pollution legislation will have an effect on inter-fuel competition?

MR. EISEN: Again, I have the same problem with that question and it is objectionable for all the reasons I heretofore stated and also calls for an opinion and conclusion of the witness. You can ask him what he knows, what he has experienced and so on but you can't ask him to speculate about a matter on which he obviously has no expertise.

MR. KEMPF: I think the record taken as a whole will demonstrate Mr. Peterson is emminently well qualified to answer this question and I ask him to do so at this time.

MR. EISEN: The question also is a very indefinite question and you refer to inter-fuel competition without delineating for what end uses the fuel is being used or consumed.

MR. KEMPF: To assist you, Mr. Eisen, let me state I am talking about all aspects of inter-fuel competition and the fuels which I am referring to are the same ones I have been referring to all morning, coal, gas, oil,

nuclear energy and I will [26] ask Mr. Peterson the question again.

Q Do you think air pollution legislation will have any effect on inter-fuel competition?

MR. EISEN: Same objection.

Q Answer the question, please.

A Yes, I do, very definitely.

I might say to you that NOFI actually is engaged in working with the government on air pollution and we have a contract, as a matter of fact, with them to run surveys on the air pollution problems on oils.

Of course, fuel oil has come under government pressure to reduce the sulphur content and this is a costly thing, but based on my reading and my understanding in talking with people within the industry, while it is costly, in fuel oil it is not as difficult to handle the sulphur problem as it is in coal.

MR. EISEN: I move to strike the volunteered comments of the witness as being an opinion which he does not have expertise. I think the answer that he has just given demonstrates that he knows something about the matter because he has discussed it with other persons, the same as lawyers learn about some of these matters when they work on cases, but this does not qualify him in my understanding [27] of qualifying an expert as an expert in the field. I am sure he has gained a lot of knowledge through reading as any layman might with regard to air pollution but he is not qualified as an expert to testify and give his opinion so as that evidence might be admissible in a case.

I think he can tell what he knows. He can give us facts, but his opinions are not admissible.

MR. KEMPF: I readily understand the reasons which prompt you to register such an objection, counsel. I think it is not without noteworthiness to this case that the plaintiff in this case is at least convinced sufficiently of Mr. Peterson and his organization's expertise in this area to have entered into a contract with him dealing with this specific subject.

MR. EISEN: I don't think that that adds anything or changes the objection at all.

MR. KEMPF: Perhaps you don't but I am sure the judge will.

MR. EISEN: If you want to produce this contract, we can see what it calls for and what Mr. Peterson had to do, what his responsibilities are under the contract, what he had to do with negotiating [28] the contract, who he discussed it with in the government, what experts he talked it over with. You could go into those matters, those conversations, even though I think they are irrevelant, at least they will explore the area of his expertise.

You have not covered to lay a foundation for this man, Mr. Peterson's qualifications as an expert so as to give his opinion in response to the question as you propounded it.

MR. KEMPF: I think the record will demonstrate clearly that Mr. Peterson is emminently qualified to answer that question. If you have any doubts, I certainly urge you to pursue this line of inquiry you have suggested on your own cross examination.

BY MR. KEMPF:

Q Do you think that air pollution legislation will have any effect on coal's ability to compete either directly or indirectly in the form of electricity for the industrial, commercial and home heating markets?

MR. EISEN: This question is objectionable for all the reasons stated with regard to the prior question, plus the additional fact that there is no evidence whatsoever that Mr. Peterson is an expert on [29-38] coal and coal's relationship to the air pollution problem.

Unless he is so qualified, I am going to suggest we are encumbering the record with a lot of testimony which is highly objectionable, no probative value to the issues in this case.

Q Please answer the question.

A Would you please repeat the question?

(The question was read.)

MR. EISEN: I further suggest, counsel, you have asked three questions in one there and it can't be answered by a general comment.

Q Would you please continue with your answer to the question?

A I think that is so because first of all the government is taking a very strong stand on the sulphur content to the extent that in some situations where historical suppliers of fuel suddenly find they have no market, they can't even use it and comply with the government regulations and then if you find fuels with low enough sulphur content to satisfy the specifications and requirements, the costs are invariably higher and as the costs of the basic fuel gets higher, the cost of the electricity or finished products gets higher and reduces their ability [39] to compete.

Q Would the same also be true for coal used directly as a source of power for generating electricity?

A Yes.

MR. EISEN: The same what?

MR. KEMPF: The same comments that he just made in connection with the industrial, commercial and home heating markets.

A I would say so, yes.

MR. KEMPF: No further questions at this time.

EXAMINATION BY MR. SIMS:

Q You used the term energy market several times in your testimony on direct. As a supplier of fuel, can you treat the energy market as a whole or do you have to focus on its parts?

MR. KEMPF: I am not sure I understand the question.

Q Do you understand it?

A I think I understand. In order to get to the parts, I have to look at the interrelations now.

I am familiar with some work that has been done talking about it on the whole and it is necessary to get a common denominator and John Winger of Chase Manhattan [40] has probably done as good a job as I have seen where in order to get a common demoninator, spelled everything out in oil barrel equivalents and of course this had an influence. That I think is fine work and I am familiar with it, so you start looking at these

things and you try to convert things to barrel equivalents then you look at the interrelationship.

• • • •

[48] Q From your knowledge does coal dominate as a fuel used by electric utilities in the Midwest?

A In the Midwest coal has probably over three-quarters of the business for utilities at the present time.

I think that needs qualification. That is at the present time, and yet we have seen in many areas where one time coal had practically all the energy and it has eroded down the road with the pollution thing, with nuclear energy. In fact, by 1980 we feel that coal will, even in that area and in the Midwest, will have a rapid erosion of its position to maybe 35 per cent, that is my best estimate.

Q And what is this based on, Mr. Peterson?

A This is based on studies, publications and conversations with economists in the business.

Q In your business or other businesses?

A In our business.

• • • •

[50] A I would say it would certainly slow down this procedure and change the timetable of the present projections which are common in the industry. In effect, if we are successful, we will help coal out to that extent. We can change those curves.

Q You said, I think you mentioned in one of your answers previously that coal's market has eroded in certain established markets.

What particular market were you referring to when you made this statement?

A Well, the one I was talking to—well, the transportation market is practically gone. In fact, that is almost 100 per cent petroleum today.

In the home heat market, it has gone from, well, approximately half of the market in 30 years to 10 per cent.

In the industrial-commercial we have had erosion there. In other words, at one time it was the primary source

of energy everywhere and the only place that it has grown has been in the electric utility, in the utility market and it has grown there, but I think it is important—

• • • •

[53] In other words, if all the conditions remained as they are right now in the universe of the market place, that might be true, but, let me remind you that right now we are almost certain that there have been fantastic crude oil finds on the North Slope and I have actual knowledge of plans to bring that into the Midwest and when that happens, we can see what happened when East Texas came in and crude oil was as low as ten cents a barrel at that time.

It is important to say, that if the status quo remains, what you asked I think was generally true, but the status quo doesn't generally stay status quo and I would hate to be tied to that.

Q Mr. Peterson, crude oil, the largest portion of it is sold to refiners, is that correct, in this country?

A Yes.

Q Crude oil is taken by a refining company and broken down into different distillates, residual fuels, isn't that correct?

A Yes.

• • • •

[57] Q Will you answer the question?

A Your oil reserves are principally in the Texas-Louisiana area. There are reserves, of course, in California, in Wyoming areas, and, of course, Illinois and Michigan and, of course, they are diminishing in the Pennsylvania area, it is not a big factor there anymore.

Of course, the big thing which now appears to be on the horizon and people are backing this with a tremendous amount of money which is the North Slope which is expected to exceed in reserves, anything we have ever seen in this country.

Q This is in Alaska?

A Yes.

Q Mr. Peterson, didn't you tell us yesterday that you were a good friend of Hammond Chaffetz?

A I didn't talk to you yesterday but the day before yesterday. I said I would consider myself so. However, I did qualify that, I think, by telling you I think everybody in the industry knows Hammond and thinks well of him. Most everybody and certainly anybody that had a connection with Standard of Indiana or American Oil Company recognizes the man's capabilities. Of course I have literally hundreds of good friends, you know, but [58] I don't dislike him, if that is what you mean. In fact, I do like him.

• • • •

APPENDIX

Volume II—Pages 465-1016

FILED
SEP 26 1973
MICHAEL RODAK, JR., CLERK

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

	Page
Relevant Docket Entries	1
Complaint by the United States filed September 22, 1967	10
Excerpts from Deposition of Frank Nugent, taken September 10-11, 1968	18
Excerpts from Deposition of Nicholas T. Camicia, taken September 17, 1968	74
Excerpts from Deposition of John M. Morris, taken September 25 & October 1, 1968	99
Excerpts from Deposition of Frank Frederick Kolbe, taken October 10, 11, 15, 17, 18, 22, 24, 28, 29, 30, & 31, 1968	126
Excerpts from Deposition of Robert H. Inman, taken November 4, 1968	184
Excerpts from Deposition of Joseph C. Tabor, taken November 8, 1968	214
Excerpts from Deposition of Thomas J. Tarzy, taken November 14-15, 1968	215

INDEX

	Page
Excerpts from Deposition of Burl Charles Jensen, taken November 21, 1968	291
Excerpts from Deposition of Thomas H. Latimer, taken December 3, 4, & 5, 1968	296
Excerpts from Deposition of Joseph J. Gallagher, taken December 12, 1968	320
Excerpt from Deposition of William L. Kurtz, taken December 12, 1968	323
Excerpts from Deposition of Martha Terleke, taken December 16, 1968	326
Excerpts from Deposition of Charles W. Stadell, taken December 16, 1968	332
Excerpts from Deposition of Harold K. Pedersen, taken December 18, 1968	339
Excerpt from Deposition of John P. Maguire, taken December 23, 1968	347
Excerpts from Deposition of B. H. Sloane, taken March 7, 1969	348
Excerpts from Deposition of Hugh E. Petersen, taken March 13, 1969	365
Excerpts from Deposition of John T. Middleton, taken March 13, 1969	380
Excerpts from Deposition of P. W. Dorrane, taken March 20, 1969	390
Excerpts from Deposition of Leon King, taken March 25, 1969	402
Excerpts from Deposition of Josephine C. Burton, taken April 14, 1969	413
Excerpts from Deposition of John P. Nix, taken April 14, 1969	417
Excerpts from Deposition of Aldo P. Brazzale, taken April 14, 1969	425
Excerpts from Deposition of Clarence V. Beck, taken April 16, 1969	429

INDEX

	Page
Excerpts from Deposition of Winford C. Peterson, taken April 18, 1969	446
Excerpts from Deposition of Harold S. Walker, Jr., taken April 18, 1969	465
Excerpts from Deposition of William J. Stanley, taken April 24, 1969	486
Excerpts from Deposition of Fred E. Nicosin, taken May 15, 1969	498
Excerpt from Deposition of William D. Stiehl, taken May 20, 1969	536
Excerpts from Deposition of Thomas N. Ward, taken May 28, 1969	546
Excerpts from Deposition of Reuben A. Redard, taken June 10, 1969	568
Excerpts from Deposition of Harry B. Gaunt, taken June 13, 1969	576
Excerpts from Deposition of Gordon J. Morrison, taken June 20, 1969	596
Excerpts from Deposition of John Samuel Moore, taken June 20, 1969	614
Excerpts from Deposition of Bernard W. Schotters, taken June 23, 1969	636
Excerpts from Deposition of Leroy M. Abrahamson, taken June 26, 1969	650
Excerpts from Deposition of George P. Gamble, taken June 27, 1969	675
Excerpts from Deposition of Jack A. Simon, taken July 31, 1969	678
Excerpts from Deposition of John E. Organ, taken August 1, 1969	683
Excerpts from Deposition of John Paul Weir, taken August 5, 1969	692
Excerpts from Deposition of S. Smith Griswold, taken August 19, 1969	706

INDEX

Page

Excerpts from Deposition of Bruce C. Netschert, taken August 20, 1969 — 731

Excerpts from Deposition of Abraham Gerber, taken August 21, 1969 — 764

Excerpts from Deposition of Peter O. Steiner, taken October 7-8, 1969 — 781

The Stipulated Testimony of C. C. Smith, dated December 4, 1968 — 832

The Stipulated Testimony of J. R. Sinclair, dated July 9, 1969, and attached exhibits 1-4 — 838

The Stipulated Testimony of George H. Shipley, dated July 10, 1969 — 848

The Stipulated Testimony of George B. Knecht, dated September 3, 1969, and attached exhibits 1-10 — 851

The Stipulated Testimony of David G. Hemminger, dated September 17, 1969 — 869

The Stipulated Testimony of John Sant, dated September 17, 1969 — 870

Excerpts from Transcript of Proceedings before Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, on October 3, 1969 — 872

Motion of Frank F. Kolbe to be excused from testifying at trial, and attached letter dated March 4, 1970 — 875

Defendants' Proposed Findings of Fact and Conclusions of Law filed October 27, 1970 — 880

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, commencing March 30, 1970:

Appearances — 1017

Testimony of Jack A. Simon

—cross — 1018

—redirect — 1037

—direct — 1038

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on March 31, 1970:	
Appearances	1044
Testimony of John M. Morris	
—direct	1046
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 1, 1970:	
Appearances	1092
Testimony of John M. Morris (resumed)	
—cross	1093
Testimony of Louis R. Tomey	
—direct	1105
—cross	1116
—redirect	1128
—recross	1132
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 2, 1970:	
Appearances	1134
Testimony of John M. Morris (resumed)	
—cross	1135
—recross	1164
Testimony of Reuben Thorson	
—direct	1164
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 3, 1970 :	
Appearances	1172
Testimony of Victor H. Wood	
—direct	1173
—cross	1179
—redirect	1188
—recross	1192
Testimony of A. H. Davis	
—direct	1196
—cross	1206

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 6, 1970:

Appearances ____ 1219

Testimony of A. H. Davis (resumed)

—cross ____ 1219
—redirect ____ 1227
—recross ____ 1229

Testimony of Ernest B. Tremmel

—direct ____ 1229
—cross ____ 1250

Testimony of Reuben Thorson

—cross ____ 1255

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 7, 1970:

Appearances ____ 1262

Testimony of Robert W. Steele

—direct ____ 1263
—cross ____ 1269
—redirect ____ 1279

Testimony of Thomas H. Latimer

—direct ____ 1282
—cross ____ 1284

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 8, 1970:

Appearances ____ 1289

Testimony of E. C. Hill

—direct ____ 1290
—cross ____ 1305

Testimony of Richard Drollinger

—direct ____ 1314

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 9, 1970:	
Appearances	1328
Testimony of George Gamble	
—direct	1329
—cross	1349
—recross	1350
Testimony of Thomas Latimer (resumed)	
—cross	1351
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 13, 1970:	
Appearances	1354
Testimony of Nicholas T. Camicia	
—direct	1355
—cross	1362
—redirect	1370
Testimony of Samuel F. Sherwood	
—direct	1372
—cross	1377
—redirect	1384
Testimony of Norman W. Moser	
—direct	1385
—cross	1391
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 14, 1970:	
Appearances	1398
Testimony of Norman W. Moser (resumed)	
—cross	1399
—redirect	1402
Testimony of Gordon R. Corey	
—direct	1404
—cross	1421
—redirect	1443
—recross	1444
—redirect	1446

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robinson on April 14, 1970:—Continued

Testimony of John D. Ames

—direct ____ 1447
—cross ____ 1452

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 15, 1970:

Appearances ____ 1456

Testimony of Daric N. Miller

—direct ____ 1457
—cross ____ 1463

Testimony of Frank Nugent

—direct ____ 1468

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 16, 1970:

Appearances ____ 1487

Testimony of Hollie Hopper

—direct ____ 1488
—cross ____ 1494
—redirect ____ 1509
—recross ____ 1514

Testimony of Frank Nugent (resumed)

—direct ____ 1515
—cross ____ 1529
—redirect ____ 1538

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 17, 1970:

Appearances ____ 1540

Testimony of Thomas L. Craig

—direct ____ 1541
—cross ____ 1553
—redirect ____ 1557

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:

Appearances ____ 1561

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:—Continued

Testimony of Peter O. Steiner

—direct 1562

Testimony of Robert H. Quig

—direct 1593
—cross 1598
—redirect 1599

Testimony of Peter O. Steiner (resumed)

—direct 1601

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 21, 1970:

Appearances 1630

Testimony of Peter O. Steiner (resumed)

—cross 1631
—redirect 1672
—recross 1677

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 22, 1970:

Appearances 1678

Testimony of James M. Folson

—direct 1681
—cross 1695
—redirect 1711

*Decision on the Merits entered by the District Court on April 13, 1972 ..... J.S. 1a

Notice of Appeal to the Supreme Court by the United States dated June 7, 1972 1717

Order of the Supreme Court noting probable jurisdiction, dated December 11, 1972 1718

* Not reprinted in Joint Appendix. Citation is to appendix of Jurisdictional Statement.

[2]

EXCERPTS FROM DEPOSITION OF HAROLD S. WALKER, TAKEN APRIL 18, 1969

• • • •

HAROLD S. WALKER, JR., called as a witness by the defendants, being first duly sworn by the Notary Public (Richard Kaufman), and stating his address as 123 Cherry Street, Katonah, N. Y. 10538, testified as follows:

EXAMINATION BY MR. KEMPF:

Q Will you state your name?
A Harold S. Walker, Jr.
Q What is your home address?
A 123 Cherry Street, Katonah, New York 10536.
Q Mr. Walker, are you appearing for your deposition [3] this afternoon pursuant to a subpoena?
A Yes, I am.
Q By whom are you employed, Mr. Walker?
A The American Gas Association, Inc.
Q What is your business address?
A 605 Third Avenue, New York, N. Y. 10016.
Q Mr. Walker, what is your present position with the American Gas Association?
A I am director of public affairs.
Q Will you briefly describe for us your background in the gas industry in general and with the American Gas Association in particular?
A I have been serving in the national association of the gas industry, this American Gas Association, since May of 1954.

I came to the Gas Association in the position of secretary of the general management section, which means that I was serving committees that were engaged in a number of staff type activities in member companies, such as insurance claims, rates, economics, finance, accident prevention and what you might describe as middle management, the managing committee of the section

was a kind of junior board of directors composed of middle management personnel in the gas industry.

[4] I then became secretary of the Association, corporate secretary, where I was in charge of the administrative activities of the Association and had the usual duties implied by the title Corporate Secretary.

After that I became assistant to the managing director, his personal assistant from a policy point of view and a speech-making point of view and so forth, but I had operating responsibility for all of the sections of the Association, the Association being organized on lines analogous to a member company.

I had charge of the operating section, the accounting section, the general management section which I used to be secretary of, the industrial-commercial sales section and the residential section.

I had a collateral responsibility of a committee on regulatory affairs.

After that I became assistant managing director and was placed in charge of public relations, government relations and administrative services of the Association, such as, utilization, engineering, statistics, economics, business research and publications.

Pursuant to a reorganization in March of 1968, I became director of public affairs, the title of assistant managing director having been abolished and became [5] responsible for government relations and public relations.

During these 14 years at the Association, I have been deeply involved in studies of fuels and energy competition, fuels and energy policy. I wrote the Association's statement of position in the fuels and energy study that was made by a staff group for the Senate Interior Committee, and I believe it was 1960, that is the green booklet that you gentlemen have been referring to.

I participated in and was largely responsible, from a staff point of view, for the formation of the potential gas and future requirements studies committees which are two committees which are supported by all three segments of the industry, the producers, the pipeline companies and the distributors and their job is to make

estimates out to the year 1990 of the amount of gas likely to be found and the amount of gas likely to be needed by that year.

Q When was the American Gas Association founded, Mr. Walker?

A In 19—well, the American Gas Association was founded in 1927, having combined two associations, one a professional society and the other a trade association and their roots go back to 1918 when the American Gas [6] Association as a membership society was first organized and before that it was called the American Gaslight Society and it goes back into the 19th century, but essentially, the American Gas Association as we know it today stems from 1927 in this across-the-board sense of being both, if you will, an engineering society with individual members and a trade association with company members.

Q Approximately how many members are there in the American Gas Association at the present time?

A Including all classifications of membership and throwing in 600 manufacturers subscribers who were not, strictly speaking, members, somewhere between 8000 and 9000.

Q How big a staff does the American Gas Association have?

A Our staff is, in the first place, distributed between New York, Washington, Cleveland and Los Angeles. The total number of staff is, it hovers around 400.

Q What function does the American Gas Association serve?

A It serves to advance the interests of the gas industry by helping our member companies perform outstanding service to the consumer, increase its share of the energy market, provide for the public health, welfare [7] and safety through safe practices and procedures, to improve the professional competence of the individual members of the Association, to exchange information among the member companies of the Association and to perform all of the functions which the general larger trade association performs in the traditional sense.

Q Do members of the American Gas Association serve the States of Illinois, Indiana, Kentucky, Tennessee, Missouri, Iowa and Minnesota?

A Yes.

Q Does gas compete with coal and other fuels for the business of the home heating customers in these Midwestern states?

A They sure do. We compete vigorously for the home heating market with everybody who comes along and at the present time, something like 50 per cent of the market is gas and about 30 per cent of the market is oil, 10 per cent coal and I have a hard time thinking it is still that high, but that is what the various surveys show, and coming along is electricity with about 2 per cent of the home heating market in that area.

Q Do the gas companies attempt to convert those customers presently using coal for home heating purposes to gas?

[8] MR. FUTTERMAN: I object to that question as leading.

Q You may answer. Do you want me to restate the question?

A Yes, restate the question.

Q Do the gas companies attempt to convert those customers presently using coal for home heating purposes to gas?

MR. FUTTERMAN: Same objection.

A I can answer it though?

Q Yes.

A Yes, we compete for the home heating market and we, of course, compete against coal. We are trying to get as great a share of the market as we can and coal is a fairly easy market, coal heating is a fairly easy market to get because of the problems that people have who burn coal, having to take the ashes out every week, so forth and so on.

It is tough to get the load away from oil.

Q Does the American Gas Association expect competition between coal and gas to continue in the home heating market in the years ahead?

MR. FUTTERMAN: Just a minute. I would like to move to strike Mr. Walker's last answer on [9] the ground it was suggested by your question.

I would ask the reporter to repeat the question that Mr. Kempf just asked.

(The question was read.)

Q You may answer.

A Yes.

Q What do those in the gas industry anticipate that the competition for the home heating market between gas and coal will look like, say, ten years from now?

MR. FUTTERMAN: Objection to that question on the ground it calls for a hearsay answer.

Q You may answer.

A Ten years—what market?

Q The home heating market and what I am specifically asking for are your views as someone who has been in the industry and had the experience which you enumerated earlier.

MR. FUTTERMAN: Are you qualifying Mr. Walker as an expert?

MR. KEMPF: I just indicated on the record the exact basis upon which I am asking him this question.

MR. FUTTERMAN: Do you withdraw your prior question and are you now asking for Mr. Walker's [10] opinion in regard to the question you just asked?

MR. KEMPF: To make it perfectly clear, I will restate the question.

THE WITNESS: Why don't you restate the question?

BY MR. KEMPF:

Q What do you anticipate that the competitive picture vis-a-vis coal and gas for the home heating market will look like in the next five to ten years?

A Between coal and gas for the home heating market in the next five to ten years, I expect that coal will completely disappear from the home heating market in the next five to ten years.

Q What about oil and electricity, vis-a-vis gas?

A In the next five to ten years—in home heating?
Q Yes.
A I think there is going to be a tremendous battle between gas and oil for a share of the market in the next five to ten years and I think this will become increasingly complex by the inroads made by electric heating into both oil and gas home heating markets. In some areas of the country, electric heating is making considerable inroads. Of course, gas continues to make considerable inroads against oil. We passed the oil [11] industry in total number of heated homes a long time ago.
Q How do you account for the growth of electricity that you have discussed?
A No moving parts, quietness, even heat, convenience and flexibility in the sense that you can have your various rooms of the house at different temperatures and safety is another consideration, but something that is sort of hard to quantify called modernity.
Electric seems to be sexier than gas or oil and people go for it because it is the mod thing to do. It is where it is at and, probably the most important thing of all is, an economic and sociological fact that if what one buys will fit one's budget, one will buy it on what he conceives to be its merits rather than on its costs.
If you can stand the outrageous electric bills and you are convinced about this modernity thing, you will buy electric heating.
Now, I might say parenthetically that this isn't true of industrial and commercial customers. They will buy strictly on economics and the consumer is almost, the householder is almost entirely at the other end of the spectrum.
Q Does gas compete with coal and other fuels for the commercial and industrial business in the Midwest? [12] A Yes, very definitely. I think gas has about 45 per cent of the industrial and commercial market and coal has about 35 per cent and oil has about 20 per cent of that market. I don't know the figures for electricity.

There are considerable uses, industrial uses for electricity. A lot of heat processing is done by electricity, especially where you have to have specially prepared atmospheres that won't permit you to have flue products going around in what you are melting and you have to use electricity for industrial heat.

Q Do you expect this competition to continue in the future?

MR. FUTTERMAN: Objection. The question suggests an answer and it is a speculative answer that is called for.

A I think the competition will intensify every time the competition comes up with some process, industrial or commercial process that gets a temporary advantage on another form of fuel, and I can speak rather feelingly of the gas industry, we make every effort through crash research programs when we are not smart enough to have something that can already be accelerated, to catch up.

We are doing work like this in the area of brass [13] melting, because other forms of fuel, specifically electricity in this case did a better job of preserving the charge. Using gas for that particular brass melting process, there would be a lot of oxidation of the brass and that would have to be lost or thrown away. We developed a process whereby we cover the metal with glass, molten glass and that keeps it from happening.

In the commercial field when the electric people came out with countertop fast-food equipment, specifically countertop friers for French fried potatos and donuts and so forth, we didn't have any countertop equipment so we had to create it and it was a very difficult problem because with electricity, you just have to wrap coils around your pots, so to speak, you just can't wrap gas flames around a pot because you have to find a way of getting rid of the flue products and in order to do that, you have to have an extremely carefully engineered product in order to get the flue products out fast enough in order to be safe, of course, so we had a great deal of difficulty in this, but nevertheless we went ahead and did it and research in that area continues and

we are developing smaller and smaller burners so that we are now capable, in the home heating market, for example, of heating the house with a furnace that is only one-half [14] the size of a standard furnace.

There we have an advantage over oil. They haven't apparently tried miniaturizing oil burners yet but they will.

Electric competition forces us in that area. An electrically heated home doesn't have a furnace and they make claim of having more space available in your basement and you don't have to run into the furnace when you are chasing the ping pong ball and so forth.

The smaller we can get our furnaces, the closer we can come to offering the same advantage that the electric heating people can.

Q Do the gas companies compete for the business of the electric utilities in the Midwest?

A Well, they must be competing for it because they are using, in the Midwest, in two blocks of Midwestern states, an excess of 400 billion cubic feet of gas per year.

That is not the kind of load that the gas industry can dismiss lightly.

By the same token, it is true that gas companies would prefer to shift that load over to more profitable uses but it can't be done overnight. It depends on the competitive situation. Gas has to [15] compete with other forms of fuel in order to make that transfer and more importantly, gas has to develop summer-time loads, because that is where most of this gas is used. That is the time when most of this gas is used, in the summertime, because there is no heating in the summertime and the company either has to pay a higher rate for taking less gas from the pipeline company or put it in storage formations in the ground and hold it until next winter and if it does not have those alternatives available, it will sell that gas on an interruptible basis to power plants or anybody else that will take it on an interruptible basis and they will make money on it, as long as they get more than they paid for it and nobody is giving gas away on an interruptible basis. It is a profitable load, although the profit margin is not like the industrial or commercial

or residential—I mean the firm industrial, commercial or residential load.

Q Does the amount of gas burned by individual utilities vary from area to area within the Midwest?

MR. FUTTERMAN: I object to that question on the ground it suggests an answer.

A Yes, it does. Some states such as Kansas generate almost all of their electricity from gas. Other states generate almost all their energy from coal, electric [16] energy from coal.

Nationwide, and this is the area I know best, of course, nationwide, 25 per cent of the electric energy is generated by gas.

Q What would the figure be for the State of Iowa, would you have any feel for that?

A It is about 50/50 in Iowa.

Q What about Missouri, Minnesota?

A I don't recall the percentages, but they are pretty high in gas usage in those areas but I don't have a feel for the actual percentages as between gas and coal or oil either for that matter. Of course, oil isn't easy to get to the Midwest. It is at the end of long transportation lines.

Q Does the gas industry consider those utilities which you have indicated consume a smaller percentage of their overall fuel requirements from the gas industry as important markets?

MR. FUTTERMAN: Would you repeat the question?

(The question was read.)

MR. FUTTERMAN: Counsel, I don't think you correctly characterized or repeated Mr. Walker's testimony. He didn't refer to a specific utility [17] and I don't understand the question. If you could rephrase it, I wish you would.

Q Does the witness understand the question?

A Let me state the question, the question I am about to answer and that will tell you whether I understand it.

Do I think that even though a utility, electric utility uses a small amount of gas, does the gas company that is selling that electric utility consider that small amount

of gas an importat market, an important sale or important load, is that the thrust of your question?

Q Yes, it is.

MR. FUTTERMAN: Then I will object to that question as calling—the answer is suggested by the question and it is hearsay.

Q Please answer the question.

A Yes, it is an important market because it is sold on an interruptible basis because otherwise the company wouldn't be able to make anything from the gas and would have to pay a higher rate for the gas that it is taking.

Pipeline companies have their rates set in such a way that if you are taking, you have a contract with the pipeline company and if you are taking 100 per cent [18] of your contract quantity day in and day out, 365 days a year, you got your lowest rate that way.

Along comes the summer and you have to cut back, say, to 70 per cent of your contract quantity, then you pay a higher rate for your gas, and this could screw up your whole economic situation.

So, if you possibly can, you continue during the summertime to take 100 per cent of your gas and either pump it into the ground or sell it for industrial interruptible uses because you could at least make as small an amount of money even as low as .025 cents but that is better than paying a penalty taking 70 per cent.

Sometimes the economics work out if you forego that load, it is costing you more money to take 70 per cent of the gas than take 100 per cent of the gas even though you are making .025 cents on it and .025 cents is merely a number to show what a tiny split point is necessary to cause a decision to use one form of energy over another, because on the other side of the fence, when the electric company which is buying this gas for X price, if that gas changes in price or if coal—gas can't change in price, they are serving it under a rate, but if coal gets down below that rate by only .025 cents, the electric company will turn on the coal.

[19] Q Does the gas industry expect competition for the business of electric utilities in the Midwest to continue in the future?

MR. FUTTERMAN: Same objection as before. You are suggesting the answers to the witness by your question.

MR. KEMPF: None of the questions I have asked in my opinion suggest any answers to the witness, but, of course, the judge will rule on that.

Q Please answer the question, Mr. Walker.

A Yes, I expect competition for the business of the electric utilities to continue in the future, but I have to qualify that in the light of earlier answers I have given and to put this thing into perspective.

As I have said before, gas companies prefer to move their sales over into areas where they can make more money and they will do that in a number of ways.

They are doing it right along by the creation of more and more underground storage pools. They are doing it more and more in the promotion, development, research, development and sale of air conditioning equipment, so that we are moving, trying to move toward the ideal situation in the future where we have the same [20] load in the summertime as we have in the wintertime and that load is the optimum mix of rates to optimize the profitability situation, and I might also say to optimize benefits to the consumer.

Q Does the gas industry have under way any projects or programs which could lead to greater inter-fuel competition, other than the ones you have discussed in connection with prior questions?

A Yes.

One way we can—well, broadly speaking we can intensify, or at least continue inter-fuel competition by not running out of gas, by continuing to be in business, to the extent that we can see ourselves in the 21st century still promoting rather than rationing our product.

Now, within that parameter, we have a number of projects on the way. One project is gasification of coal. We are building, pretty soon, a million cubic foot a day gas plant in Chicago which will be an experimental large size pilot plant which we expect will lengthen out our reserves of gas.

We are already engaged in importing liquified natural gas into this country for the purpose of providing peak shaving service. Peak shaving means supplying gas in the wintertime when it is very cold and you can't [21] get enough gas from the pipeline company.

This is a way too, of storing natural gas in liquid form for those companies that are not fortunate enough to have underground storage pools, but this, of course, is a peak shaving business and so far much of it is being done by gasifying, by liquifying gas in the summertime and putting it in tanks in the summertime, gas from the pipeline, domestic gas from the pipeline, rather than pumping it into the ground because there isn't any underground storage capacity available.

Just a couple of weeks ago, gas from Algeria, liquid gas from Algeria was delivered in Boston. The Philadelphia gas people are negotiating with Venezuela for quantities of liquified gas and the field is very alive today.

In another way we intend to stay in competition is by freeing up tight formations in areas out in the West. You probably all heard of Project Gas Buggy, where an atomic explosion was set off underground in a tight gas formation and greatly increased the flow of gas from that formation.

In the standard or average gas formation you can get up to 80 per cent of the gas that is in there out. Practically the only gas that is left there by the [22] time it is exhausted is gas that is in there because it is under atmospheric pressure and you can't pump it out.

In this tight formation in the Picture Cliffs area in New Mexico, the recovery from that field was only 30 per cent and it is too early to tell what percentage it has been increased to but the gas flow has increased immeasurably in a few months of testing out there. They have already produced twice as much or something like that of gas as they produced in a well right next door produced in nine years.

This will add to our reserves.

This means that we are going to have plenty of gas in the future and we are going to sell it in the future.

Q Are you familiar with the new discoveries of petroleum and natural gas in Alaska and in Canada?

A Yes, generally speaking. Those reserves will help us stay in business in the future.

The last time I counted it, and this was quite some time ago, but it can only be larger since, we had under contract with Canada, 6 trillion cubic feet of gas. In effect, that added 6 trillion cubic feet to our own domestic recoverable reserves, assuming a long-term [23] contract will be honored.

Large quantities of gas have already been discovered in Alaska in the Cook Inlet area and now gas and oil both are being found on the North Slope in Alaska.

When that gas finds an outlet, it will contribute to the competitive situation and displace coal and oil.

Q Are you familiar with the development of geothermal power generation on the West Coast?

A Yes. Pacific Gas & Electric Company which is engaged in that development is a member of this Association. They are quite enthusiastic about the project and to the extent that they can develop large amounts of geothermal energy, they will make contributions to air pollution control and displace competing forms of energy to other parts of the country.

Q Do you expect air pollution to have any effect on inter-fuel competition in the years ahead?

MR. FUTTERMAN: Objection. You are suggesting an answer to the witness again.

A Well, I can answer that question both as to what is happening now as well as to what I can see will happen in the future.

Air pollution control in the City of New York has already led to substantial alterations in the [24] competitive situation in the market. So much so that both Con Edison and Brooklyn Union have invented temperature controlled rates.

These rates operate in this way: A building owner, a large user of energy for heating may have had either

coal or bunker C oil which has a high sulphur content and the city regulations call for a reduction of that sulphur content to 1 per cent by 1971.

Things are moving faster than that, however, and one of the reasons they are moving faster is because of those temperature controlled rates.

You go to the building owner and you say you put in a standby tank for No. 2 oil. This is ordinary home heating oil which has no appreciable sulphur content and is a fairly clean burning fuel, and we will supply you with gas all year round for your heating until the temperature gets to be 20 degrees or less.

When it changes to 20 degrees, then you agree to turn on your oil burner and turn the gas back on again when the temperature gets above 20 degrees.

There is only one reason that that rate was invented and that was to make a contribution to air pollution control in the City of New York.

It isn't the only place where this is going on. [25] It is going on in Philadelphia. All you have to do is look at some of the ads that the Philadelphia Gas Works put in the paper showing a smoggy city to know that they are competing like hell to get heating business away from coal and oil.

MR. KEMPF: I have no further questions at this time.

MR. FUTTERMAN: Can we take a short recess?

(Short recess taken.)

EXAMINATION BY MR. FUTTERMAN:

Q Mr. Walker, isn't it a fact that in 1966, coal contributed approximately 93 per cent of the BTUs generated by steam electric utilities in Illinois?

A I seem to recall some such a figure.

Q Isn't it also a fact that in 1966 coal contributed approximately 96 per cent of the BTUs generated by steam electric utilities in Indiana?

A I am not as familiar with the Indiana figure but I would concede that.

Q Isn't it a fact that in 1966 coal contributed approximately 100 per cent of the BTUs generated by steam electric utilities in Wisconsin?

A Yes. There are some areas in Wisconsin, however, [26] where a lot of gas is used and I was talking about portions of some of these states.

* * * *

[35] Q Is it your opinion that gas companies experience minimum demand during the summer months?

MR. KEMPF: I am not sure I understand the question. I have no objection to the witness answering it if he does. If he does not, however, I would certainly ask that counsel clarify it.

Q Do you understand the question?

A Yes, in the sense that the gas companies sell less gas in the summertime than they do any other part of the year.

Q Is it your opinion that gas companies must keep the gas coming through the pipelines during the summer months despite the lesser demand during the summer months?

A Yes.

MR. KEMP: I will object to this line of inquiry again. Mr. Walker detailed his position with regard to this matter quite clearly, at quite a length during the course of my direct examination.

I see no purpose being served by having him go through the same course of inquiry a second time.

MR. FUTTERMAN: I object to your interruption to my cross examination, counsel. I am [36] trying to amplify what Mr. Walker testified to on direct examination as is my right on cross examination.

MR. KEMPF: And I would wish to indicate to the record I am, of course, not interrupting your cross examination, but merely exercising my right to object to those portions of your cross examination which are in my judgment objectionable.

A Yes.

Q Mr. Walker, didn't interruptible rates result because the gas company had to sell this gas it was taking

during the summer even though its prime markets weren't taking that gas?

A Even though? Because its prime markets weren't taking the gas.

Q Mr. Walker, isn't it a fact that the interruptible rates are set just below the prevailing coal price for equivalent BTUs even though the price may yield only a minimum return on investment to the gas company?

MR. KEMPF: I will ask that question be read again. There are several qualifying statements within it.

(The question was read.)

MR. KEMPF: I will object to this question [37] on the basis that once again it was covered in detail during the course of my direct examination.

Q Would you answer the question?

A Yes. Generally speaking, the prices are arrived at by either one of two processes.

In those states where it is only possible for the company to serve gas under specified tariffs, the company has to seek a tariff which is just under the competition.

In some states, it is possible for a company to contract for industrial loads like that directly with a supplier in which case he can set his price just under. I am trying to make that clear, make it clear that companies are not at quite the liberty that your question would indicate. They don't just set prices. Their prices are regulated with some exceptions.

Now, even though there is a very small return, in order to put that question into perspective, certainly the return is small, but the return is not an insignificant return.

I don't have figures for an individual gas company, but I do know the total interruptible sales, and it is in that book too.

* * * *

[39] Q Electric utilities need a guaranteed source of [40] energy all year around, do they not?

A Yes.

Q Interruptible gas does not provide a continuous source of energy, is that correct?

MR. KEMPF: By definition.

A By definition.

MR. CUSACK: The Government objects to the statement of Mr. Kempf which was just made by Mr. Kempf as being highly improper.

MR. KEMPF: What I was indicating on the record was that Mr. Futterman's question answers itself. If something is interruptible, it is interruptible.

MR. CUSACK: Your statement, sir, was out of order.

MR. KEMPF: The Court, of course, will rule on that.

BY MR. FUTTERMAN:

Q Mr. Walker, isn't it true that gas companies are declining the amount of interruptible gas sales as a result of the result of the development of underground gas storage caverns?

A To some extent, yes, in areas where underground gas storage is feasible.

[41] Q Isn't it also true, sir, that companies which do not have underground gas storage caverns rely on other gas companies which do have underground storage caverns to store gas for them?

A To some extent where the economics will permit it.

Q Do People's Gas and Northern Illinois Gas have underground gas storage caverns?

A Yes, they do.

Q Those two companies are located in the State of Illinois, are they?

A Yes, they are.

Q Isn't it true that the purpose for storing gas in underground storage caverns is to permit the gas company to fulfill its obligation to the pipeline company by continuing to take gas during the summer and at the same time, permit the gas company to store that gas for sale during the winter when they can achieve or obtain greater revenues for the gas?

MR. KEMPF: That is a complicated question. I ask for my benefit the reporter please read it.

(The question was read.)

A This is what happens when it makes economic [42] sense to do so.

I would say for the record that these really aren't caverns, they are underground porous formations, there isn't any hole down there, or cavity down there.

The gas company can only store gas for as long a period of time as it is economically feasible to do. As any shopkeeper knows, he loses money the longer he keeps stuff on the shelf.

It is necessary to look at the whole economics of the underground storage situation in order to determine whether you can in fact hold all of that gas you are pumping underground for use next winter or whether you must supply some of that gas, not put it underground, supply some of that gas for interruptible use.

Q Mr. Walker, are gas companies without underground storage facilities liquifying gas or buying liquified gas in the summer for sale in the winter?

A Is that a question?

Q Yes.

A I must have missed the first part.

(The question was read.)

A Are they liquifying it or buying it for sale in the winter?

Q Buying liquified gas.

[43] A They are doing this, but here is how it works.

You don't buy liquified natural gas from Venezuela in April that you are going to use next January.

If you have a liquification plant where you are making liquid natural gas during the year, this is a rather expensive proposition, so typically, you start when the heating season ends, May or so, you start liquifying your gas at that time and you keep liquifying that gas up through maybe even September or October, for that matter and by that time your small capacity equipment has filled the tank and then if you get a real cold series of days, that tank may empty itself out in five days in the wintertime and that is a very expensive proposition, although it is not as expensive as buying penalty gas

they call it from the pipeline company and, of course, it is not as expensive as not being able to get any gas.

Q Is the gas liquified as it comes out of the pipeline?

A Yes, through a liquification plant, but it has very small capacity so it takes a long time to fill the tank.

It is not the kind of plant that is in Algeria, which has the job of liquifying large amounts of gas quickly and therefore it is a tremendous installation.

* * * *

[47] Q Would it be fair to state that the gas companies in Illinois would prefer not to sell gas to the electric utilities if that gas could be sold in the home heating market?

A I would say the answer to that had to be broader than the question. They would prefer to sell their gas for uses where they can make more money on it than they could make on it for interruptible uses.

This means that they would prefer to sell it for firm industrial use.

The home heating market is, of course, our base load market, but it only has a 50 per cent load factor and the very fact we are so successful in selling all that gas in the wintertime, gives us problems in the summertime because we have to maintain the capacity of the design of the system and we have to keep paying for that system over a long amortization period of time because the gas industry is a capital intensive industry.

We have to continue to pay for those facilities, whether there is a cubic foot of gas moving through the line or not and, therefore, in the summertime, we have to keep selling it in order to make a contribution toward the amortization of that investment.

You don't make any contribution whatsoever [48] toward your amortization of investment when you are not selling gas and, I might say, the electric industry is in the same shape at different times of the year. That is why they are selling electric heating. To try to use their facilities in the wintertime.

Q I will ask you a question now that is a hypothetical.

I want you to assume that gas can be sold to electric utilities at a price lower than coal and I want you to further assume that the electric utility would then be able to reduce its rates to its consumers in the home heating market.

My question to you based on those two assumptions is, would that not make electricity more competitive with gas and enable electricity to be a stronger competitor for the home heating market?

MR. KEMPF: Could I have that question reread?

(The question was read.)

A If there was a wide disparity in the—if gas were able to undercut coal by a wide margin, and I have no idea how wide the margin has to be, this would be true.

However, it is a competitive practice to undercut [49] the competition by only so much as is necessary to do so.

* * * *

[52] Q Would you explain that, please?

A The money that producers acquire as a result of [53] the depletion allowance is available for exploration for further quantities of gas, to the extent that the depletion allowance is reduced, less money for exploration will be available and the gas reserves will decline and gas will become scarcer and there will be upward pressures on gas prices and eventually curtailments of gas service starting off at the interruptible end of the spectrum.

Q Have the policies of the Federal Power Commission had an adverse effect on the coal industry, I mean on the gas industry?

A Yes. We don't feel that the Federal Power Commission in its development of area pricing has arrived at methods and procedures setting the prices of gas in the field that are sufficiently precise for the Commission to be able to confidently say that a certain price set will in fact induce the producers to search for the further quantities of gas.

We think that the prices set are on the low side and we see a demonstration of that in the fact, in the fact that I have already mentioned, the 40 per cent decline

in well drilling and the first time decline in available reserves.

* * * *

[57] BY MR. KEMPF:

Q Does the witness recall the question?

A I think I need the question repeated.

(The question was read.)

A Yes.

Q During the course of your cross examination by Mr. Futterman, you indicated concern over certain policies by the Federal Power Commission.

My question to you is this: Is the American Gas Association devoting energy and resources to efforts aimed at changing those policies?

A We are engaged in an effort to work with government toward the development of wise public policy, to the extent that we feel that certain public policies are erroneous or inhibitory, we work not merely to change them, but to improve them.

Q Thank you.

Mr. Walker, do all distributors of products and services hope to sell their products or services for more money rather than for less money?

Do you understand the question?

A Yes, I understand the question. Yes, all distributors of products and services would like to receive more rather than less for their products and [58] services.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF WILLIAM J. STANLEY, TAKEN APRIL 24, 1969

* * * *

(The witness was thereupon duly sworn.)

WILLIAM J. STANLEY,

called as a witness by the defendants herein, having been by me, the said Claude W. Youker, Jr., as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. HAUBOLD:

Q Sir, would you state your name and the present position you hold.

A My name is William J. Stanley. I am Director of Air Pollution Control for the City of Chicago.

Q Mr. Stanley, could you describe very briefly your prior professional experience?

A My educational background is fundamentally engineering and business administration.

I have worked with the Worthington Corporation, the University of Illinois and the Chicago International Trade Fair.

[4] Q Where did you take your engineering training, Mr. Stanley?

A The University of Illinois. I have a Bachelor's degree. I also have a Master's degree in business administration at De Paul.

Q In what field of engineering did you receive your degree?

A Mechanical; mechanical engineering.

Q Can you describe briefly, Mr. Stanley, what your responsibilities are as Director of the Department of Air Pollution Control for the City of Chicago?

A The major responsibility, of course, is to enforce the ordinance, and the duties of the Director are clearly outlined in that ordinance, if you want to go over them.

Q As Director of the Department of Air Pollution Control, have you participated, or did you participate in the formulation of the standards and limitations contained in the June 19, 1968, amendments to the ordinance?

A Yes. We provided the technical information that was required by the Committee on Health concerning the feasibility and the effects of this [5] ordinance.

Q Can you describe generally the types of problems that the standards and limitations were aimed at correcting?

A The amendments to our ordinance were aimed at several areas.

No. 1 were the particular limitations on fuel burning and other industrial processes.

Secondly were the sulfur limitations on fuels being used in Chicago.

Thirdly was the practice of garbage burning in coal-fired units and some operational changes.

Q Specifically, what are the restrictions concerning sulfur limitations in fuels contained in the ordinance?

MR. SIMS: I think the ordinance itself would be the best source for this.

BY THE WITNESS:

A Yes. It is in the ordinance. 2.5 the first year, 2 one year from then, and a limit of 1.5 per cent thereafter, something to that effect. It is in the ordinance.

[6] BY MR. HAUBOLD:

Q When you spell out per cent, are you referring to per cent content sulfur by weight?

A By weight. Per cent sulfur content by weight. That is expressed in the ordinance.

Q Why were the restrictions on sulfur expressed in per cent content of fuels?

A Well, for two reasons: No. 1, to limit the fuel coming into the Chicago area; and No. 2, it is a most

expedient engineering way of calculating how much goes out the stack.

Q Did your department consider an alternative of emission standards as opposed to fuel content standards?

A In our ordinance we have both. We have emission standards and fuel content standards, so you really have to look at the ordinances as a total. You cannot take it in pieces as such.

You have to look at it as a total, because we have emission standards on certain things, we have fuel limitations and opacity and nuisance. We have, really, four parts to our ordinance.

Q Specifically with regard to the restrictions on sulfur content, did you study the feasibility [7] of providing an emission standard rather than a fuel content standard?

A Yes. The problem there was that there was really not a technology that one could use to meet a particular emission standard, so therefore, in the particulate area where we have the technology, we have it expressed as an emission standard.

In the area where we do not have a technology, we have it expressed as a fuel limitation.

Q Such as in the sulfur content?

A The sulfur content, that is correct.

Q Are you presently aware of any economically feasible process by which sulfur can be removed from fuels?

MR. SIMS: Sulfur in what form, counsel?

MR. HAUBOLD: I am glad you clarified that. Let me rephrase the question.

BY MR. HAUBOLD:

Q Do you presently have any knowledge of an economically feasible way by which non-pyritic sulfur can be removed from coal?

A So far as I know and so far as the indications are, there is no large scale methodology [8] available for removing sulfur in the pyritic or the free state from the fuel before it is being burned.

Q Mr. Stanley, did your department undertake any studies to determine the availability of low-sulfur coal for consumers in Chicago?

A We did.

Q Can you describe generally that study and how it was undertaken?

A We did a direct mail study to several distributor groups and also direct producers in the midwest area that normally supply the Chicago market, and the indication was that in the small and intermediate size markets, that is, for the smaller, non-utility market, there was an abundance of low-sulfur coal available.

The utility market represents—or the supply to the utilities represents an entirely different marketing channel, and that this would require special consideration.

Q Mr. Stanley, by "low-sulfur coal", are you referring to coal which meets the Chicago standards?

A That is correct.

[9] Q Mr. Stanley, do you have—

A You could add to that that we were not looking at just sulfur. We were looking at the total energy picture, coal, oil and gas.

Before we passed an ordinance, we made a study to find out that if we did pass the ordinance, was there an energy availability in the normal marketing channels to meet the situation that we are proposing by law, and we found that there was an adequate supply of coal, low-sulfur coal, an adequate supply of gas, and an adequate supply of low-sulfur oil, so we were not talking about coal, oil or gas, we were talking about the total energy picture when we did this study.

Q Mr. Stanley, in your opinion, what is the likely effect of the sulfur content restrictions on utility coal consumption in Chicago?

A The utilities have, over the past several years, been going to larger power plants, remotely away from the city.

Therefore, the use of coal in the smaller power plants as they remain in the city has been going down. That is, the use of coal in existing power plants has been going down, and [10] it has been substituted by gas or oil, in Chicago as well as in other areas, and the construction of new power plants has been either mine

mouth installations or nuclear energy, and this has been the trend in Chicago, and the ordinance, we were advised by the Commonwealth Edison Company, would only accelerate this process, but this was in the plans.

The complete proposal made by Commonwealth Edison on the displacement of energy sources for Chicago in the utility area is in the report that I gave you from Commonwealth Edison, which was presented to the Appeal Board.

Q Mr. Stanley, from your studies do you have an estimate as to what percentage of sulfur dioxide emissions within the city of Chicago currently stems from electric utility production?

A Our best estimate, from the figures we got from Commonwealth Edison, indicate that about 60 per cent or 65 per cent, depending on the time of the year, of the sulfur emissions on the ground, leaving the ground in the Chicago area, was from the burning of high-sulfur coal in utility power plants.

Q Mr. Stanley, can you describe generally [11] the facilities your department has for the detection of pollution sources within the city?

A We have three ways to handle it. No. 1, we have the telemetered air monitoring network, which indicates the condition of the atmosphere.

We measure wind speed, wind direction, sulfur dioxide, particulate matter and CO, carbon monoxide, at various stations in the city.

We also do a qualitative and quantitative emission inventory on the large industrial users of fuel and other processes, fuel burning and other processes.

We also have twenty cars on the street that respond to violations as they occur.

Q Can you describe typically what would happen if a private citizen would phone in a complaint that a source of pollution had been detected in his area? What mechanism would you set in motion under these conditions?

A We respond to citizen complaints with the automobile first. We send out an automobile to investigate it.

If he finds in fact that there is a violation taking

place, we will begin with a $10 summons [12] or a $10 ticket.

From there, if it appears to be an equipment defect or a process that requires control, we route it through our Engineering Services Division, where it is put on a continuous surveillance basis, and the equipment is evaluated individually.

I ought to say, too, that every single new plant, every single building that goes through the Building Department is reviewed. We station a man down there and we review every single new construction with respect to air pollution in not only fuel burning but incineration and all the industrial processes.

Q Does your department undertake inspections at given intervals to determine whether specific combustion equipment is operating properly and not producing pollution?

A We annually inspect 40,000 fuel and refuse-burning installations in the city, with respect to which we issue a permit to operate for an additional year.

We also annually inspect about 5,000 industrial installations having various processes, fuel-burning and other chemical or industrial [13] processes.

Q What kinds of sanctions are available against polluters who violate the air pollution ordinance?

A I think the single most important thing we have is the permit system, which is a permit to install and a permit to operate, and a revocation of the permit actually puts the man out of business.

We have an injunction procedure, and on the single violation we have a ticket procedure beginning at $10 and ending up with a maximum of $200 a day.

Q In addition to the sulfur content requirements contained in the ordinance, are there any provisions for emergency action whenever sulfur oxide concentrations reach a dangerous level?

A By the use of the telemetered air monitoring network we have instituted an incident control plan by which we require and by ordinance I have the authority to request certain sources of pollution, power plants and other large industrial users, to shift to a lower sulfur fuel during adverse meterologic conditions.

[14] The entire pr[illegible]m, or as much of it as we have developed, was in that paper I gave you on incident control strategy.

Q Just so I am clear on this, you have the authority to require these users to shift to a lower sulfur fuel?

A That is correct. We also have a hot line procedure with Commonwealth Edison on their sources, whereby they can very quickly shift to gas or low-sulfur fuel during certain periods, and also shift the power generating out of this area and into other areas.

Q Mr. Stanley, were you Chairman of the Policy Committee for the Northeastern Planning Commission?

A Well, I was—

Q Or have you been such Chairman?

A I was Chairman of the Policy Committee that did a study of the managing of air resources in northeastern Illinois, as it was presented under a 701 planning grant from the Housing and Urban Development Department. I am not Chairman of the Northeastern Illinois Planning Commission.

Q But you are Chairman of the Policy Com- [15] mittee which—

A The Policy Committee for this particular study at this particular time.

Q In that capacity as Chairman of the Policy Committee, did you participate in formulating findings and recommendations regarding air quality in the Northeastern Illinois Region?

A Well, I do not think you can say "air quality."

Q Just let me withdraw the question. I get your point.

A That is bad semantics for us, because air quality is "qual" and "quan", and it becomes involved.

Q Did you participate in the drafting of certain actions to improve air quality contained in Report No. 6 of the Northeastern Planning Commission?

A Well, the basic intent of the study was, No. 1, to determine what the condition of the air was in the Northeastern Illinois sector, and second, what actions could be taken as part of the planning function to maintain this air quality or improve it, and at the same time ac-

commodate increased populations, [16] densities and so on.

Now, this was what we fundamentally addressed ourselves to. There were recommendations on how one could proceed in doing this, but there was no indication here to provide either air quality criteria or value judgments of whether the air is healthy or unhealthy. It was not that kind of a study.

Q Do you agree with the actions or recommendations set forth in the report?

A Fundamentally, I think I have to agree with most of them. Remember, there were three agencies here that were involved in this, the City of Chicago, Cook County, where most of the people are, the City of Chicago and Cook County, the other six counties and the State of Illinois, so everyone made their share of recommendations.

I think, however, that fundamentally it provides a departure point for looking at the air pollution problem in Northeastern Illinois and the way we have to address ourselves to it.

MR. HAUBOLD: Off the record, please.

(There was a discussion off the record, after which the taking of the deposition [17] was resumed as follows:)

MR. HAUBOLD: Mr. Reporter, will you mark this document as Defendants' Stanley Deposition Exhibit 1 for identification, please.

(The document was thereupon marked Defendants' Stanley Deposition Exhibit 1 for identification, 4-24-69.)

MR. HAUBOLD: Will you mark this document, please, Mr. Youker, as Defendants' Stanley Deposition Exhibit 2 for identification.

(The document was thereupon marked Defendants' Stanley Deposition Exhibit 2 for identification, 4-24-69.)

MR. HAUBOLD: And will you mark this document as Defendants' Stanley Deposition Exhibit 3 for identification.

(The document was thereupon marked Defendants' Stanley Deposition Exhibit 3 for identification, 4-24-69.)

[18] BY MR. HAUBOLD:

Q Mr. Stanley, I show you a document which has been marked Defendants' Stanley Deposition Exhibit 1 and ask you if you can identify this document as a copy of the technical report No. 6 of the Northeastern Illinois Planning Commission, entitled, "Managing the Air Resource", to which you have referred in your deposition.

A That is correct.

Q Mr. Stanley, I show you another document which has been marked Defendants' Stanley Deposition Exhibit 2, entitled, "A Report on Commonwealth Edison Company's Air Pollution Control Program", of the City of Chicago's Department of Air Pollution Control, and ask you whether this report is the report to which you referred in your deposition as being submitted by Commonwealth Edison?

A This appears to be the way it was presented to us by Commonwealth Edison, yes.

Q I now show you a document marked Stanley Deposition Exhibit 3 for identification, APA No. 68-172, entitled, "Chicago's Air Resource Management Program, Planning for Clean Air", and ask you whether this is a document produced by your office, [19] containing remarks made by you at the 61st Annual Meeting of the Air Pollution Control Administration in St. Paul, Minnesota, on June 27, 1968?

A That is correct.

MR. HAUBOLD: I have no further questions.

MR. SIMS: Mr. Stanley, I have only a few questions.

CROSS EXAMINATION

BY MR. SIMS:

Q Does the air pollution control ordinance delegate to an Appeal Board wide discretion in determining whether

to grant a variance to a particular individual or business?

MR. HAUBOLD: I object to the use of the term "wide discretion", unless you further define it.

BY MR. SIMS:

Q Wasn't this term "wide discretion" used in the statute?

A You would have to look back at the ordinance. I can't remember that part of it.

Q Well, does it—

A The Appeal Board has, really, the authority to question any decision I make, fundamentally.

* * * *

[22] Q You testified that you contacted coal producers supplying coal to Chicago. Do you recall which ones you contacted?

A Oh, no. I can't remember what they were, but these were the ordinary channels that we found that were supplying coal to Chicago and Northeastern Illinois. I think we have that list around some place, if it is important.

Q Do you anticipate that coal will continue to be a major source for the generation of electricity in Illinois?

A Well, I think that energy from coal will be one source of power, whether it is burned in Chicago, whether it is cracked at the mine and the gas burned at Chicago, or whether it is burned at the mine mouth and so on, but coal itself, you see, will be a major energy source for Northeastern Illinois, obviously.

Q Is it not a fact that Commonwealth Edison's major generating stations consuming coal are located outside of the city of Chicago?

MR. HAUBOLD: I object on the basis that [23] it is ambiguous, what the term "major" means in that connection.

BY THE WITNESS:

A I think if you want this information on coal usage by plant, you can get this from Commonwealth Edison.

They have some large plants outside of the city, that is true, but the percentage of how they operate under various conditions and at various times of the year is quite flexible.

The trend has been to burn less coal in the city and to build larger power plants out of the metropolitan area, simply because you can't buy that much real estate to stack and pile it.

Furthermore, the technology of transmitting energy over high voltage lines has become more economical than transporting the coal over land or water, so the way they go at it is such that you will have to do a total balance on not only Commonwealth Edison, but all the other power companies that they are integrated with so that you can have some idea of how they operate.

We are primarily concerned with and I am legally limited to the activities in the city [24] of Chicago.

BY MR. SIMS:

Q Would you envision any difficulty for a large industrial consumer to obtain a variance to bring in high-sulfur coal, into the city, if he could show that he installed a control technique that would maintain sulfur oxides and particulate emissions within the prescribed limits of the ordinance?

MR. HAUBOLD: I object to that hypothetical and conjectural question on the grounds that Mr. Stanley has already stated that he believes such control technology is not presently available.

MR. SIMS: This is hypothetical. Would you answer the question, please, sir.

BY THE WITNESS:

A Well, the ordinance specifically states that there is relief in three areas. First, you can limit the fuel you are using, secondly that you can combine two or more—let me give you an example.

If a power plant had three boilers, you could put one of them in gas, one of them in low- [25] sulfur oil and one of them in high sulfur coal, so that all three of them

together, based on BTU, would not emit a certain percentage of sulfur.

This is in the ordinance and this, fundamentally, is the basis for the appeals that are being made.

Secondly, there is also a provision in the ordinance whereby anyone having a control device that will limit the amount of sulfur that is being burned can put this device in. Do you understand that, now?

MR. SIMS: Yes. I think so.

THE WITNESS: All right.

MR. SIMS: Now, let me ask you—

BY THE WITNESS:

A This is a flexibility we built into the ordinance because of technical problems.

BY MR. SIMS:

Q Mr. Stanley, is it not a fact that current total consumption by all consumers in Chicago is approximately eight to nine million tons of coal?

MR. HAUBOLD: I object to the question unless you can show that Mr. Stanley has [26] some means of knowledge with respect to this subject.

• • • •

[5]

EXCERPTS FROM DEPOSITION OF FRED E. NICOSIN, TAKEN MAY 15, 1969

• • • •

FRED E. NICOSIN,

having been first duly sworn to tell the truth, the whole truth and nothing but the truth, relating to said matter, was examined and testified as follows:

DIRECT EXAMINATION

QUESTIONS BY MR. REUBEN L. HEDLUND:

Q A few introductory words, Mr. Nicosin. First of all, are you appearing at this deposition by virtue of subpoena issued on you?

A Yes.

Q During my examination I will try to make my questions as understandable and as clear as possible. In the event that you don't understand what I have asked, please feel free to ask me to explain the question or to make it more understandable.

Also, in the event that you have not finished your answer to a question but I ask a new one before you have had a chance to complete your answer, please say that you haven't finished your answer so that we get your full answer. I will not do this intentionally, but while we are going along here I may inadvertently do that.

[6] Mr. Nicosin, would you please state your full name, address and business affiliation?

A Fred E. Nicosin, 611 Raymond Street, Plainsfield, Indiana, Vice President of Power, Public Service Indiana.

Q Would you please give us a brief description of your educational and professional background?

A I have been with Public Service forty-two plus years, having come up through the operating ranks. My education was acquired in the schools of Terre Haute and at Rose Polytechnic Institute. In 1966 I received a Master of Engineering honorary degree from that school.

Q Could you, sir, over the course of the last 15 years indicate what your function was with Public Service of Indiana?

A I'm not trying to tell you how to do it, but maybe if you would confine it to the last 11 years when I have been in headquarters. Prior to that I was a superintendent at a generating station out in the field. The scope of responsibility here in headquarters has been for the operation and maintenance of all the generating stations and the high voltage [7] transmission system of Public Service Indiana. And another major function has been either the direct negotiating and buying or overseeing the purchase of coal for Public Service of Indiana.

Q In your present capacity do you also have responsibility with respect to the actual or prospective purchase of other forms of energy for Public Service of Indiana, such as oil, gas, nuclear energy, that sort of thing?

A Yes, under my direction. Up until two years ago I did a lot of it personally, and since that time I work through what we call a fuel manager now, Mr. Masselink.

Q For how long have you been with Public Service of Indiana involved in either coal purchasing or coal use or coal burning, the various areas in which people in a utility come into contact with coal?

A The answer to such a general question is the first job I had with Public Service in 1926 was operating a coal area which put the coal in the hoppers on top of the boiler. So in conjunction with coal I have pretty well run the gamut.

Q Of the electric utilities in the State of Indiana [8] serving the public, how does Public Service of Indiana rank in terms of kilowatt capacity?

A Nationally?

Q No, within the State of Indiana.

A Within the state? We are the largest capacity-wise in the State of Indiana.

Q Could you briefly describe the geographical areas served by Public Service of Indiana?

A We serve in 69 of the, I believe total of 92 counties, predominantly in the central section and the south-

east section. When I say central section, exclusive of Marion County.

Q Would you, sir, please name the generating stations presently operated by Public Service of Indiana?

A The Noblesville generating station located at Noblesville approximately 20 miles northeast of Indianapolis; the Markland hydrostation on the Ohio River near Markland, Indiana; the Gallagher generating station located at New Albany, Indiana; the Edwardsport generating station at Edwardsport, Indiana; the Dresser generating station southwest of Terre Haute, Indiana; the Wabash River generating station northwest of Terre Haute, Indiana; a small [9] station that we acquired last year at Rushville, Indiana, where we purchased the municipal facilities; and we have under construction a new generating station at Cayuga, Indiana; and we have an internal combustion peaking station at Wabash, Indiana.

Q As to each of these stations I would like to ask you a series of questions, and I think we will do it station by station, so that it will hopefully appear more orderly in the transcript.

The Noblesville station was constructed in what year, if you recall?

A 1950 it went in service.

Q And what is the approximate kilowatt capacity of that plant?

A One hundred megawatts.

Q In the year 1967 approximately how many tons of coal were consumed at that station?

A Approximately 78,000 tons.

Q Who was the supplier of that tonnage?

A The sales agency is Pickands Mather who represent Old Ben. Old Ben Coal Corporation, I think, is the right corporate name now. They have shifted around corporate-wise the last two or three years. I can't [10] hardly keep up with them.

Q And from which mine of Old Ben or which mines were the shipments being made?

A From the Enos and Blackfoot mines in southwestern Indiana.

Q Do you know approximately how far the Noblesville plant is from those two mines?

A As I recall, approximately 135 miles.

Q Did all the coal shipped from those two mines in 1967 to the Noblesville plant arrive by rail?

A Yes.

Q Do you know on which railroad?

A The delivering road is the Nickel Plate. The originating road is—I'm not sure whether that gets into that private railroad down there or not.

MR. CAMPBELL: Off the record a minute.

(Discussion outside the record)

Q The delivering carrier is the Norfolk & Western, successor to the Nickel Plate?

A Right.

Q And you do not know the name of the railroad that is the originating carrier?

[11] A I think it is the Penn Central.

Q Is the Noblesville plant served by any other railroad other than the Norfolk & Western?

A No.

Q At the Noblesville plant are you presently purchasing and were you purchasing in 1967 coal under a long term contract?

A Yes. What is your definition of long term?

Q Well, in excess of one year.

A Yes.

Q Could you give me the length of that contract in terms of years and the year in which it was first effective and its termination year?

A As I recall, the originating date was November 1, 1962, the termination date December 31, 1971.

Q Mr. Nicosin, according to the 1968 edition of Steam-Electric Plant Factors the average cost per ton f.o.b. plant at Noblesville was $6.49. Is that approximately correct?

A Yes.

Q That would include transportation, would it not?

A Yes.

Q Can you give me the approximate percentage of the [12] delivered cost of coal to that plant represented by transportation charges?

A Approximately 37 percent.

Q To your knowledge, has the facility at Noblesville ever been served by a mine or mines located within the State of Illinois?

A No.

MR. SIMS: Would you give me that question back?

(The Reporter read back Q28)

A Not to my knowledge.

Q I'd like to turn now to the Markland hydroelectric plant on the Ohio River. Approximately how far west of the Ohio state line is that plant located?

A I don't know that answer. It's approximately 20 miles upstream from Madison, Indiana. As I recall, it's about half-way between—well, that's as near as I can get it. It's within three miles of Vevay, Indiana—V-e-v-a-y.

Q And when was that plant constructed?

A Either April '67 or April '68.

Q Within the past two years?

[13] A Yes.

Q What is the kilowatt capacity of that plant?

A Eighty-one megawatts; eighty-one thousand kilowatts.

MR. SIMS: Mr. Hedlund. I'm going to interrupt at this point. We understood from your last pre-trial conversation from your remarks that you intended to conduct this deposition to elicit facts that were set out in these questionnaires sent to consumers. You are asking Mr. Nicosin questions that were not asked in the consumer questionnaire. Do you plan to ask all electric utilities that received this questionnaire these similar questions that you are asking Mr. Nicosin about plants that are not coal consuming?

MR. HEDLUND: I may, yes indeed.

MR. SIMS: All of the electric companies?

MR. HEDLUND: I'm not certain all, but I certainly will cover this subject.

MR. SIMS: I thought the whole purpose of sending out the questionnaire was to reduce the deposition time and discovery period. This is defeating the purpose now.
[14] MR. HEDLUND: May we continue?

Q Is that plant able to burn coal or any other fuel?

A No.

Q Has that plant been an efficient generating station and a satisfactory performer?

A Yes.

MR. CAMPBELL: Off the record again.

(Discussion outside the record)

Q Does that plant use oil for start-up and emergency purposes?

A We have an auxiliary diesel driven generator that burns oil and is used in case the station is out of service or trips out of service, and this is for protection or to furnish power for sump pumps and lubricating oil and so forth for protection of the equipment.

Q With respect to the Gallagher plant now, would you tell me where that is located?

A It is located on the Ohio River at New Albany, Indiana, across from Louisville.

Q When was that station built?

A The first unit went in service in December, 1958, [15] the fourth unit in 1961.

Q Approximately what is the kilowatt capacity of that plant?

A 637,000 kilowatts maximum.

Q That is a coal burning station, is that correct?

A Right.

Q During 1967 who were the coal suppliers for that station?

A The Pittsburg & Midway Coal Mining Company, the Peabody Coal Company, and Ayrshire Collieries through their agent, Republic Coal & Coke Company.

Q Which mines of Pittsburg & Midway serve that plant?

A In 1967 it was the Paradise mine.

Q Do you know where that is located?

A It is located, I think, in Muhlenberg County, Kentucky.

Q In 1968 were you also receiving shipments from the Paradise mine?

A From the Paradise mine, and Pittsburg during that year opened a new mine called Drake. So both mines now serve the station.

Q Where is the Drake mine located?

A Nearby in the same county, located on the Green River.

[16] Q In Kentucky?

A In Kentucky, western Kentucky.

Q From which mines of Peabody was Gallagher receiving shipments in 1967?

A The River Queen mine in western Kentucky and the Lynnville mine in Indiana.

Q Can you indicate approximately where the River Queen mine is located and the Lynnville mine?

A It's in the same county.

Q Muhlenberg County?

A Muhlenberg County. The Lynnville mine is in southern Indiana near a town called Lynnville.

Q From which mines of Ayrshire was the Gallagher plant being supplied?

A Gibraltar mine which is in the same west Kentucky area on the Green River.

Q During 1967 by what means of transportation was coal received at the Gallagher plant?

A By barge, river barge.

Q All barge?

A All barge.

Q Does that plant have rail facilities?

A It does not; it does not have a rail unloading facility. It has rail service but not coal unloading [17] facilities.

MR. CAMPBELL: Off the record again.

(Discussion outside the record)

Q Mr. Nicosin, what is the difference between rail service to the plant and a rail or coal unloading facility?

A Well, we have a railroad in there to haul supplies, repair parts, chemicals, but there is no rail unloading facility whereby you can unload a car of coal, a railroad car of coal.

Q Mr. Nicosin, accocrding to the 1968 edition of Steam-Electric Plant Factors at page 11, the average cost per ton f.o.b. plant of coal to the Gallagher station is stated at $4.36 a ton. Is that accurate?

A Approximately, as far as the average.

Q With respect to your shipments in 1967 at Gallagher, what percentage of the delivered costs was represented by transportation ex costs.

A About 21½ percent.

Q To your knowledge, has the Gallagher facility ever burned coal produced by a mine or mines located within the State of Illinois?

A Not to my knowledge.

[18] MR. SIMS: Counsel, do you intend to ask him who supplied this plant in 1966?

MR. HEDLUND: No, I don't.

MR. SIMS: Wasn't this asked by the questionnaires?

MR. HEDLUND: Yes. Would you like me to ask it?

MR. SIMS: It was our impression, counselor—

Q Well, let me ask this question: With respect to your generating stations were your suppliers the same in 1966 as they were in 1967?

MR. SIMS: Take your time in answering that, Mr. Nicosin.

A That's too big a question for all generating stations. I'd have to think that out in big detail.

Q All right. I'd like to turn now to the Edwardsport facility. Could you tell me first where that is located?

A Approximately 17 miles northeast of Vincennes, Indiana, on the White River.

Q I'm sorry, I'm going to have to return for a moment [19] to the Gallagher facility.

In 1967 what was the approximate tonnage shipped to the Gallagher facility by Pittsburg & Midway?

A Approximately 796,000 tons.

Q Was that under a long-term contract?

A Yes.

Q What was the beginning and ending date of that contract?

A The original beginning date was April 1, 1956 prior to the start of the plant. Since that time it has been amended. Now the expiration of the present amendment is December 31, 1972.

Q What was the original expiration date?

A I cannot answer that without checking further.

Q Approximately how many tons in 1967 did Peabody ship to that plant?

A Approximately 581,000.

Q Was that under a long-term contract?

A Yes.

Q What were the beginning and ending dates of that contract?

A The original contract also began in 1956 and has since been amended, and the most recent amendment was [20] from April 1, 1961 to December 31, 1972.

Q Approximately how many tons were shipped by Ayrshire in 1967 to the Gallagher plant?

A Approximately 273,000.

Q And was that under a long-term contract?

A That contract originally started in January 1, 1961, and expires December 31, 1970.

Q Now, if I may return to the Edwardsport plant, when was that constructed?

A The original construction was way back in the early twenties, and we have retired some units from there. Of the units that are now in service there, to the best of my knowledge, the oldest unit was about 1940 and the other two units have been installed since then. I would guess the oldest unit is about 1944, something like that.

Q How far, approximately, from the Illinois state line is Edwardsport located?

A Eighteen, nineteen miles. I guess right across the bridge is Illinois, isn't it, so it would be eighteen, nineteen miles.

Q In 1967 who were the suppliers of Edwardsport? That is a coal burning facility, is [21] it not?

A Yes, and again this station uses oil for light-off purposes.

The suppliers in 1967 were the Peabody Coal Company and the Sunshine Coal Corporation.

Q Approximately how many tons of coal in 1967 were shipped by Peabody?

A 346,000.

Q From which mines of Peabody, if you recall?

A From the Hawthorn mine north of Sandborn, Indiana.

Q Were those shipments made by Peabody pursuant to a long-term contract?

A Yes, their contract at Edwardsport runs from May 7, 1962 to December 31, 1971.

Q Could you tell us, please, sir what the Sunshine Coal Cooperative is?

A The name in 1967 was the Sunshine Coal Corporation which was a cooperative operation operating a small shaft underground mine in the near vicinity to Bicknell, Indiana.

Q I'm sorry, where was that?

A Bicknell—B-i-c-k-n-e-l-l.

Q You say this was in 1967. What change, if any, [22] took place with respect to this cooperative in 1968?

A I don't know whether I can keep up with them or not.

Q Is the mine still operating?

A No, it's not operating as of today. To the best of my knowledge, the cooperative group are attempting a refinancing program to continue the mine in operation, but to the best of my knowledge the last couple of months they have not been successful.

Q Approximately how many tons were shipped in 1967 by Sunshine to Edwardsport?

A 27,000, and that was by truck.

Q That was by truck?

A Right.

Q How were the shipments from the Peabody Hawthorn mine received at Edwardsport?

A By rail; Pennsylvania Railroad, which is now Penn Central.

Q Is that the delivering carrier at Edwardsport?
A Yes.
Q Is that facility served by any other railroad?
A No.
Q Do you know what the originating carrier is from [23] the Hawthorn mine?
A Pennsylvania all the way.
Q It's a single line haul?
A Right.
Q According to the 1968 edition of Steam-Electric Plant Factors on page 11 it is stated that the average cost per ton f.o.b. plant of coal at Edwardsport in 1967 was $4.39. Is that approximately correct?
A Yes.
Q Of the delivered costs of the coal shipped by Peabody to Edwardsport in 1967, what percentage was represented by transportation?
A You asked the percentage by Peabody?
Approximately 15 percent.
Q Would you be able to give me the percentage with respect to the Sunshine shipments?
A Approximately 13 percent.
Q How far is the Sunshine mine, or was the Sunshine mine, from Edwardsport?
A Approximately seven mile.
Q Seven miles?
A Right.
Q Were the shipments by Sunshine pursuant to a long- [24] term contract?
A It's a five-year contract.
Q How are they presently meeting their commitments under that contract?
A They are not presently as of today meeting their commitments. During the year of 1969, during this period of, I guess you could call it reorganization or refinancing, they had been furnishing coal as a sales agency from some other mines.
Q Are those mines located in Indiana, if you know?
A I'm sure they're in Indiana but I can't give you the names of the mines. They're small, very small operations.

Q Is their coal still coming by truck?
A Yes.
Q From these mines?
A Yes.
Q To your knowledge, has the facility at Edwardsport ever burned coal from any mine or mines located within the state of Illinois?
A Not that I can recall.
Q Could you tell me the approximate location of the Dresser plant?
[25] A Approximately ten miles southwest of Terre Haute, Indiana.
Q Is that on the Wabash River?
A Yes.
Q Approximately how far is that station from the Illinois state line?
A Three to four miles.
Q When was that station constructed?
A The original unit went in service in 1923.
Q What is the present kilowatt capacity of the station?
A Approximately 200,000 kilowatts.
Q I neglected to ask you the generating capacity of the Edwardsport facility.
A 165,000 kilowatts.
Q Could you please, sir, for the year 1967 give me the approximate tonnages shipped by coal producers to Dresser?
A 248,000.
Q And that was by whom?
A By Ayrshire, shipped by truck.
Q From which mine?
A Chinook mine near Staunton, Indiana, approximately 12 miles east of Terre Haute.
[26] Q How far is the Chinook mine from the Dresser facility?
A Roughly 22 miles.
Q Is the Dresser facility able to receive coal by barge?
A No.
Q Why is that?

A The Wabash River is not navigable nor do we have barge unloading facilities at Dresser.

Q By not navigable, you mean up to that point?

A That's right.

MR. CAMPBELL: Off the record again.

Q For coal barges?

A To my knowledge there's never been a coal barge on the Wabash River.

MR. CAMPBELL: Off the record just a minute.

(Discussion outside the record)

Q Do you have rail unloading facility at Dresser?

A Yes.

Q What railroad is—

A Penn Central.

Q Penn Central?

[27] A Right.

Q At Dresser in 1967, the 1968 edition of Steam-Electric Plant Factors indicates the average cost per ton f.o.b plant of coal to have been $4.59 a ton. Is that approximately correct?

A Yes.

Q Of the delivered cost of coal in 1967 to Dresser, approximately what percentage of that was represented by transportation costs?

A Sixteen percent.

Q Were the shipments by Ayrshire to that plant pursuant to a long-term contract?

A Yes.

Q What were the dates of that contract?

A January 1, 1964 to December 31, 1978.

Q To your knowledge has the Dresser plant ever burned coal produced in any mine or mines located within the state of Illinois?

A Well, there's a technicality here. Originally Dresser plant was served by the Dresser mine which is adjacent to the plant. The mine has entries that go underground beyond the Indiana line.

Q So that the coal may have come from Illinois but the mine was located in Indiana?

[28] A The mine tipple and preparation plant was in Indiana, but underground I think it extended into Illinois.

Q Other than that instance—

A Other than that, I know of no Illinois mine that has served the plant.

Q Where is the Wabash River facility of Public Service of Indiana located?

A Approximately eight miles northeast of Terre Haute on the Wabash River.

Q Is this station upriver from Dresser?

A Yes.

Q Approximately how far east of the Illinois state line is that plant located?

A Again, roughly three to five miles.

Q What is the kilowatt generating capacity of Wabash River?

A 887,000 kilowatts.

Q And when was that facility originally constructed?

A The first unit went in service in 1953 and the last unit, the No. 6 unit, went in service in June of last year, 1968. There are six units at the station.

Q During 1967 who were the suppliers and their approximate tonnages to the Wabash River facility?

[29] A Peabody Coal Company with approximately 1,125,000 tons; Ayrshire Collieries, 548,000 tons.

Q Were the Peabody shipments pursuant to a long-term contract?

A Yes.

Q Would you give me those dates, please, sir?

A Original date was April, 1964, amended in 1968 and expires in December 31, 1978.

Ayrshire, January 1, '64, December 31, 1978.

Q From which mines of Peabody were shipments received at the Wabash River facility in 1967?

A In 1967 mostly from the Hawthorn mine, and there may have been some lesser portion from Airline.

Q We have already established the location of the Hawthorn mine. Where is the Airline mine of Peabody?

A The Airline mine is south of Linton, Indiana, or approximately six miles northeast of the Hawthorn mine.

Q How were the Peabody shipments of coal to Wabash River received in 1967?

A By rail.

Q What railroad serves Wabash? Is that the Penn Central?

[30] A The Milwaukee.

Q The Milwaukee?

A Unit train haul.

Q On the unit train haul to Wabash River from Peabody who owns the cars?

A The railroad. The Ayrshire coal is a part of the same unit train.

Q And from which mine of Ayrshire?

A From the Minnehaha which is near Dugger, Indiana.

Q How far is the Minnehaha mine from either Hawthorn or Airline, do you know?

A May I borrow your map a minute?

(Witness examines document)

Let's see, you want to know from Hawthorn to the Minne, is that it?

Q Yes, sir.

A Somewhere between five and ten miles. Is that close enough?

Q On a one particular haul will this train collect coal from both Ayrshire's mine and Peabody's mine?

A Right.

Q Approximately how many tons does that train deliver [31] to Wabash River per haul?

A In 1967?

Q Yes, sir.

A As I recall, it's about a 7200 ton train. Now, there is a qualification. The Milwaukee pulls the coal from the Minnehaha mine and the Pennsylvania pulls the coal from the Hawthorn mine and brings it over to Bee Hunter junction where it is then made up with the Ayrshire coal into the Milwaukee unit train, so there are two railroads involved.

Q What is the approximate tonnage of the unit train that must be carried a year?

A There are several increments with a different tariff with each increment.

Q By increments, that means the tariff increases as the total tonnage for the year decreases?

A Right. They are annual minimums.

Q Can you for 1967 give me the approximate minimum tonnage?

A That determined the freight rate?

Q That determined the freight rate.

A Yes, 1,300,000, I think it is.

Q Is it fair to say below that your cost per ton or the tariff was increased?

[32] A Right.

Q And above it was decreased?

A Right.

Q Presently what is the minimum tariff tonnage, if that is a proper phrase?

A We added another increment of 2,000,000 tons which reduces the tariff.

Q Do you know offhand in, let's say, 1968, how many trainloads a week you would receive at Wabash River?

A Normally five trainloads with some intermittent six-day shipments.

Q How long does it take you to unload a unit train at Wabash River?

A We have in the tariff a 12-hour unloading time.

Q Do you know how long Peabody and Ayrshire are allocated in the tariff to load the train, or load their portion of the train?

A They have 17 hours.

Q According to the 1968 edition of Steam-Electric Plant Factors there is indicated that at Wabash River in the year 1967 the average cost per ton of coal f.o.b. plant was $4.36. Is that approximately [33] correct?

A Yes.

Q Or was that approximately correct?

A Yes.

Q With respect to the shipments received in 1967 at Wabash River, approximately what percent of the delivered cost of coal was represented by transportation costs?

MR. SIMS: For which company?

MR. HEDLUND: Well, let's take the total first.

A Well, the freight from either company was the same.

Q Was the same?

A Because of the unit train rate, and it was approximately 12 percent.

Q To your knowledge, has the Wabash River facility ever burned coal produced in any mine or mines located within the state of Illinois?

A Well, again now—

Q And excluding the one mine that ended up under the state of Illinois.

A To my knowledge, no, they did not burn any from a [34] mine in Illinois.

Q In 1967 was Public Service of Indiana operating the Rushville power plant?

A No, not in '67.

Q Do you know at present who is supplying the Rushville plant?

A The coal purchased for Rushville is not by contract, it is by purchase order, and normally will come from either Peabody or Ayrshire.

Q Do you know which mines are involved?

A It comes by truck—no, excuse me, I'm wrong. It comes by Pennsylvania, delivered by Penn Central.

I'm not sure without asking.

Q The 1968 edition of Steam-Electric Plant Factors indicates that that facility consumed 19,000 tons of coal in 1967. Is that, to your knowledge, approximately correct?

A At Rushville?

Q Yes.

A I have no knowledge of how much coal they consumed in 1967. It was not under our operation.

Q Do you know at present on an annual basis how much coal that facility is consuming?

[35] A On the basis on which we are operating it?

Q Yes.

A It will not reach 1,000 tons per year.

Q Is that because the load or capacity of Rushville has been taken up by your other facilities?

A That's because of the excessive cost of generation on this Rushville plant whereby we can serve our customers at a lesser rate from our other stations.

Q I see. Do you recall what the generating capacity of that plant is?

A It is now rated at 4,000 kw.

Q Kilowatts.

A Four megawatts.

Q You have one additional facility that I don't think we have covered or specifically named. That is the peaking station which you referred to prior. Where is that located?

A In our substation at Wabash, Indiana.

Q Can you tell us approximately where in the state Wabash, Indiana is located, for us in Chicago?

A With relationship to what?

Q Indianapolis, say.

(Witness examines map)

[36] A I'd say Wabash, Indiana is on the Wabash River approximately 75 miles north and a little east of Indianapolis.

Q What fuel is burned at that station?

A Oil.

Q And what is the capacity of the station?

A Winter rating is 75,000 kw.

Q Is that station equipped to burn coal?

A No.

Q When was that built, if I may ask?

A '68.

Q 1968?

A Yes.

Q You presently have a new generation station under construction, is that correct?

A Yes, sir.

Q Would you give us the name of that and its approximate location?

A It will be the Cayuga generating station and is located on the Wabash River near the small town of Cayuga, Indiana, approximately 20 miles southeast of Danville, Illinois.

Q Approximately how far is that station from the [37] Illinois state line?

A Approximately two to three miles.

Q Is there more than one generating unit involved or will be involved at Cayuga?

A Yes, the first unit is scheduled for in service in summer of 1970 and the second unit the summer of 1972.

Q Are these equal sized units?

A Five hundred megawatt units each.

Q When did planning of the first unit begin?

A I would say approximately 1965.

Q Are these to be coal fired generating units?

A Yes.

Q When both units come in operation how many tons of coal per year will that facility burn?

A Two million eight hundred thousand to three million tons per year at full capacity.

Q When you began looking for a coal supplier for this plant, could you tell me what, if any, requirements with respect to the term of the contract or the amount of coal reserves you had in mind?

A If I understand your question properly, it was our thinking that we should have either under contract or [38] available to support this station location 70,000,000 tons of coal, which in our thinking is a 30-year consumption.

Q Why did you want to have under contract or available to this plant as much as 70,000,000 tons or 30 years worth of coal?

A Well, the main reason is that if you locate a generating station based on a particular delivered coal cost or cost into the boilers and you do not have sufficient coal to last the 30 year life of that station—30 years plus—then it's possible that in the remaining years of the station your coal costs would be so high that you might have picked the wrong location for the station. And we try to look at the average production costs or the predicted production costs over the life of the station, so that we try to supply it or locate it such that it will have a minimum coal cost during its life. In other words, we couldn't take the chance that, let's say, for 15 years

we had a coal supply, and then if we had to go two or three hundred miles away to find coal to supply that plant, we could have put it in the wrong location.

[39] Q Might you also have chosen the wrong fuel?

A It could have been also that we chose the wrong fuel.

MR. SIMS: Object to leading by counsel.

Q You have announced, have you not, who the supplier of the coal to this plant will be?

A We have a letter of intent with the Peabody Coal Company and have a contract in the process of negotiation.

Q How long will this contract be and for approximately how many tons?

A The contract will be definitely for 15 years with several options to continue for the second 15 years. So in effect technically you can call it a 30-year contract.

Q These options are yours?

A Yes.

Q Approximately how many tons then would be involved over the 30 years?

A Over the 30 years, 70,000,000 tons.

Q Will this coal come from an existing mine of Peabody?

A No, it will come from a new mine now being built.

[40] Q Where is that mine to be located?

A It's located near Universal, Indiana, which is approximately ten miles northwest of Terre Haute, Indiana.

Q And approximately how far from the Cayuga station will this mine be?

A Thirty to thirty-five miles.

Q You say this mine is presently under construction?

A Right.

Q When is it expected to reach capacity, if you know?

A Oh, it's expected to load the first coal in January, 1970, and of course, will not reach full capacity until we have our second unit ready to consume the coal, which is 1972.

Q How will the coal get from the new Peabody mine to the Cayuga station?

A By unit train or the present C&EI Railroad.

Q Will this be in shipper or railroad owned cars?

A It will be in utility owned cars. We will own the cars.

Q Will this involve more than one railroad?

A No.

Q It is a single line?

[41] A It's a single line haul. The reason I qualified C&EI, as of now, they're in the throes of being purchased by L&N.

Q Will the cost per ton on this unit train be less than 50 cents a ton, assuming the minimum tariff shipments are reached?

A Yes.

Q What are the minimum shipments under the tariff?

A Well, again this tariff will have several annual increments, in that the first two years the one unit will only burn approximately a million four to a million five hundred thousand tons.

So if I recall properly, we have increments of one million, two million and two and a half million annual minimums, and each carries a different tariff. Naturally the two and a half million is the lower tariff, lowest of the three.

Q Mr. Nicosin, you have testified that with respect to your existing and planned coal fired generating stations you are not aware of any coal being burned at these stations produced at mines located within the state of Illinois, other than the exception that we have talked about where the actual shaft may go across the state line or the—

[42] A Entry, they call it.

Q Entry. Can you tell me why this is?

A Mainly because the transportation is a large part of the delivered cost, and it has been to our advantage to date—we have been successful in acquiring lower costs because of this transportation within our own state and nearer each plant. As you can well see from the location of the mines I have mentioned, most of the plants are served by a mine nearby, very nearby. Naturally this is to reduce the transportation costs.

Q Mr. Nicosin, I'd like to show you what has been previously marked as Nugent Deposition Exhibit 1.

I do this not to examine him on the basis of this, but to give him an idea of the geography involved, and if you have another map you prefer to use, I'd be willing to use that.

MR. FUTTERMAN: This is Nugent Deposition Exhibit 37.

MR. HEDLUND: Well, whatever the exhibit number is of the Jack Simon map of 1966 entitled Shipping Coal Mines in Illinois.

[43] Q Mr. Nicosin, with respect to any of your generating stations, do you believe it likely that any mine located in the Fulton-Peoria shipping district as designated on this map, which is basically west of the Illinois River in the vicinity of Peoria and Havana, Illinois, do you believe any of those mines would be able to compete for the coal business of your facilities in Indiana?

MR. SIMS: Object; it's speculative.

MR. HEDLUND: You may answer.

A It is very doubtful in that the area you have pointed out is so far away from any of our plant locations, that it's reasonable to believe that we can buy at a better price near our plants.

Q Would the same be true with respect to mines located in the area designated on the map as Springfield?

MR. SIMS: The same objection.

A I would guess the answer is the same.

Q What about the area designated as Belleville?

MR. SIMS: The same objection.

A I would guess the answer is the same. I don't think [44] we could afford to buy coal any place in Illinois unless it was near the Indiana line.

Q Mr. Nicosin, are you familiar with the location of the present mines of the United Electric Coal Companies?

A No.

Q Are you familiar with the present location of the mines of Freeman Coal Corporation?

A No, I am not.

Q I'd like to ask you to assume that the mines of the United Electric Coal Companies are located in the Fulton-

Peoria area that appeared on the map and the Belleville area, and that the mines of Freeman are located in the southern Illinois area and the Springfield area as shown on the map. With that assumption in mind, and having also in mind your prior testimony, has the common ownership of these two coal companies by General Dynamics had any effect on Public Service of Indiana in any way?

A Not to my knowledge, since I was unaware that General Dynamics even owned them.

Q Would there be any disadvantage or detriment to [45] Public Service of Indiana if this common ownership were to continue?

MR. SIMS: Object as speculative; opinion.

MR. HEDLUND: Well, it strikes me, counsel, that the charging paragraph in your complaint speaks in terms of likelihood of effect on competition, and this is exactly what I am trying to explore, from those mines most likely to be affected or not affected at all.

Do you have my question in mind?

A Will you try it again?

MR. HEDLUND: Will you read the question?

(The Reporter read the following question: "Would there be any disadvantage or detriment to Public Service of Indiana if this common ownership were to continue?")

MR. SIMS: You're asking him for a legal conclusion, which was the basis of the complaint, and it is therefore an opinion that Mr. Nicosin is not in a position to give.

MR. HEDLUND: I am asking Mr. Nicosin's [46] economic judgment and his opinion.

I'm sorry, we have had a lot of interruptions. Would you like the question read again?

THE WITNESS: No.

A Not to my knowledge can I see it would have any effect.

Q Would there be any benefit to Public Service of Indiana if the court were to require General Dynamics to divest itself of its ownership of the United Electric Coal Companies?

A I can't see that there would be any benefit.

Q During the process of the decision making with respect to the Cayuga plant, did you investigate other forms of energy as fuel for this station?

A Yes.

Q And which were those?

A Nuclear.

Q Were there any others?

A Well, when you say investigate, I can answer that naturally it goes through our mind is gas or oil available at an economic price, and we already know that it was not. So when you say investigate, we [47] do not make any direct contact as a result of that. So the two uppermost forms of energy available to us at a price was nuclear or coal.

Q Have you in the past considered the use of pumped storage?

A Yes. We have not in conjunction with the Cayuga operation, but for the company as a whole.

Q By pumped storage I meant pumped storage of water.

A Yes.

Q I say that for the benefit of those who may read this who are not as familiar as we'd like to think we are with the facts and the industry. Have you recently approached the natural gas companies in the state of Indiana with respect to the possible use of natural gas as a generating fuel?

A Yes, within the last six months we have approached gas companies with regard to our Noblesville generating station because of the escalated rates that we now pay at Noblesville that we think are way too high, and we investigated to see if we could find another fuel such as gas that was cheaper than the delivered cost of coal.

[48] Q Is Public Service of Indiana presently sponsoring research with respect to nuclear energy?

A Yes. We are a participant in a Westinghouse project for the development of a fast breeder reactor in which there are a number of utilities and other interested people that make contributions. We are also a participant in a 15-company study group headed by our consulting architect engineer, Sargent & Lundy, whereby represent-

atives of these companies meet twice a year to review the progress and status of nuclear plant construction and costs.

Q With respect to future expansion of your generating facilities, either expansion of existing ones or new facilities, does Public Service of Indiana have a policy with respect to the fuels or other forms of energy that will be used?

A Do we have a policy?

Q Yes, do you have a policy or general approach in your planning and thinking with respect to expansion and additional construction?

A I guess you could call it a general policy, but it will be our position to build and design the plant to utilize the most economical fuel available.

[49] Q Will this include fuels other than coal?

A Yes.

Q Are pending or proposed air pollution regulations of concern to Public Service of Indiana?

A Yes.

Q Have you had any experience with the desulphurization developments of Combustion Engineering?

A How did you phrase that? Have I had any experience?

Q Yes, have you had any experience or dealings with Combustion Engineering regarding the desulphurization of fuel gases?

A I have had explanations of the experimental projects they had in conjunction with Detroit Edison River Rouge plant,—I don't know whether it's River Rouge or St. Clair Rouge—where they carried on the research, and Combustion Engineering made contacts with us as to whether we were interested in putting in the original installation which is now going in at Union Electric.

As far as experience, my experience is only from the knowledge that they imparted with regard to that project.

Q What was your response or what was the response of [50] Public Service of Indiana to the approach by Combustion Engineering?

A The response was that we were not interested at this time.

Q And why was that?

A We did not think that the developments were far enough along to justify the expenditure that it would take to do the job properly for the amount of money involved.

Q To your knowledge, has your forecast proven correct?

A From word-of-mouth information, yes.

MR. SIMS: Move to strike the answer as hearsay.

Q Mr. Nicosin, what would you think of someone who told you that coal is coal?

MR. SIMS: Object. That is too general, too vague. What do you mean, coal is not coal compared to oil or gas, atomic energy, counselor?

MR. HEDLUND: You may answer.

A There's a lot of variations and kinds of coal. "Coal is coal" is not an informative statement.

[51] MR. SIMS: Nor the question.

Q Would it be a statement likely to be made by someone knowledgeable with respect to coal?

A No.

Q When you are purchasing coal for any of your facilities, or indeed for any of the equipment or different kinds of equipment within a a particular facility, are the characteristics of coal important?

A Very definitely. The characteristics must be compatible with the boiler design for proficiency and low cost operation.

Q Which characteristics are important in that connection, of the coal?

A Well, there are a number of characteristics such as ash, moisture, BTU, volatile matter, the iron and aluminum and silica in the ash. These are all erosive and corrosive elements. The fusion temperature, the initial softening temperature, the grindability. These and other factors are all important and have some bearing on the type of equipment you design and buy.

Q As well as the type of coal which you purchase?

A I don't quite understand.

[52] Q I suppose what I am saying is, is it a chicken and an egg, which comes first, you design the boiler to

fit the coal or do you buy the coal to fit the boiler or do you do both?

A You do both.

Q Do you have any facility where you have got different types of equipment burning coals with different characteristics?

A Yes, we have at our Edwardsport station what is called a wet bottom boiler which must have coal that the ash will flow in a molten form into a receiving slag tank. The other boilers in that station won't handle as well the same kind of coal because they have dry bottom boilers. So we have had some trial or necessity spot burnings whereby we had to put one kind of coal in one boiler and one in the other. Otherwise we would have some malfunctions or poor operations.

Q Physically how do you handle at this facility keeping the coal going into the right boiler?

A It is the responsibility of the coal handling personnel to change their conveyor belt so that it puts the right coal in the bunker for the respective boiler.

[53] Q Do you keep the coal in separate piles?

A Well, not insofar as the storage. What I am referring to, normally we unload straight from the cars or the transportation facility into the bunkers, so that in a given train if we had two kinds of coal in the train they would unload the one kind of coal and divert or cause their conveyor belts to put that coal into the bunker of this boiler, then they would change their equipment so that the conveyor belts put the second kind of coal into the other boilers. This is a manipulation of the conveying equipment.

Q Are any of your facilities buying a blend of coal from either different mines or different seams?

A Yes, at the present time our Wabash River station is buying a combination of veins 3, 6 and 7. The Gallagher station is receiving veins—I'm not sure this is exactly right—9, 12 and 13 out of west Kentucky.

Q Are the three seams involved, 3, 6 and 7 or 9, 11 and 12, I believe you said—

A Nine, twelve and thirteen.

Q —Nine, twelve and thirteen, are these blended in a specific proportion or can you vary it?

[54] A It can be varied, but there is a certain limitation. For example, at Wabash River station the last unit we placed in operation, No. 6 unit, the maximum of the No. 3 vein that we can properly handle without adverse effect is 30 percent. And even if you get 30 percent of No. 3 you have to have at least another five percent,—what I'm saying is 35 percent of No. 7 to temper the No. 3. The percentage of No. 6 can vary in accordance with the amount of these two. No. 6 is not a limiting factor.

Q What would happen if you were to get a shipment of 60 percent No. 6, 20 percent No. 3 and 20 percent No. 7, and tried to burn it?

A That would not be too bad a blend. Normally we need five percent more of No. 7 then we do No. 3, so there would be some slight adverse effect.

Q Suppose you had 60 percent No. 7 and 20 percent No. 3 and No. 6?

A Very good. It would operate very good. The thing we don't want to do is to get more than 30 percent No. 3. If we do, we not only have the possibility of pluggage which causes a reduction of output, but it also increases our wear and tear on [55] the coal processing equipment.

Q How is this blending of the three seams, say 3, 6 and 7, how is that actually accomplished? Is that done by the producer, and are all three of these seams from the same mine?

A Well, the word "mine" is not quite right here. You have to call it a pit. No. 3 comes out of one pit and the No. 6 and No. 7 come out of the other pit. No. 7 is on top of No. 6. So they are transported then to the processing plant, and as they are unloaded and go through the washing plant then they are blended together so that the product that comes out into the cars from the processing plant is blended.

Q With respect to the facility that we have been talking about using this blend, would a producer who could only sell you No. 3 seam coal be able to compete for that business?

A Not for this particular unit. They could if you are still in the design throes. You could alternate the design of the boiler to handle No. 3, at an extra cost.

Q With respect to the boiler design at Cayuga plant, [56] who designed the boilers there?

A Combustion Engineering.

Q Did they require you to provide them with the characteristics of the coal that was going to be burned?

A Yes. Now, let me add here that coal has enough variation that they have to design within a range. I'm not saying that it's a science, it's that accurate, but definitely they have to know the range of characteristics that this coal will have to be compatible with their design.

Q Were your initial specifications to Combustion Engineering satisfactory?

A For Cayuga?

Q Cayuga.

MR. SIMS: Satisfactory for what, counsel?

MR. HEDLUND: I am asking if they were sufficiently specific.

A Yes, for Cayuga, as far as I remember.

Q I'm sorry, I guess I didn't get your answer.

A As far as I can recall, they were satisfactory for design of the Cayuga plant.

[57] Q What about the Wabash facility?

A Well, originally the coal that was to be provided for Wabash 6 was to come from the Chieftain mine which had different characteristics than the coal that we are now buying. So when Peabody elected not to expand their Chieftain mine but to open a new mine which would be this 3, 6, 7 blend, we had to go back to the boiler manufacturer and make some alterations.

Q What was the cost of those alterations? I mean, were they minimal or substantial?

A Well, in the general area of half a million, if that fits—I don't know what your terminology is.

Q To me, sir, that would be substantial. Are you aware of any utility that is burning coal produced at a mine that is also serving you that you can't burn?

Is that question clear?

MR. SIMS: Repeat the question, please.

(The Reporter read the following question: "Are you aware of any utility that is burning coal produced at a mine that is also serving you that you can't burn?")

[58] Q Let me rephrase it. Is there some mine presently serving you that produces a type of coal which you cannot burn but which is being burned by another utility?

MR. FUTTERMAN: Counsel, that question is highly confusing. You say is the mine serving him but he can't burn the coal?

MR. HEDLUND: No.

Do you understand the question?

Please read the question.

(The Reporter read the following question: "Is there some mine presently serving you that produces a type of coal which you cannot burn but which is being burned by another utility?")

Q Obviously some mines produce a variety of coals, some of which you can use, some of which you can't. Is that the case?

A In the first place, I am not fully aware of what other utilities some of these mines serve that serve us, and I am not aware of all the grades of coal that they may send from that mine. I don't think I can answer your question.

[59] MR. CAMPBELL: Do you want to go off the record here a minute?

(Discusion outside the record)

Q What I am driving at, Mr. Nicosin, or trying to—

MR. SIMS: Lead you into saying.

Q —are you aware that some No. 3 seam coal in Indiana is being burned by Wisconsin utilities?

A It's my understanding that a portion of the No. 3 is being sold to a Wisconsin utility and they're burning No. 3 by itself.

Q Why do they prefer that, if you know?

A No. 3 out of this particular mine is a higher BTU than No. 6 or No. 7, but some of the other characteristics

cause it to be a high fouling characteristic coal in certain types of boilers, and our unit 6 boiler will not handle the high fouling characteristics, so they choose to buy the higher BTU coal and take care of these other adverse factors because of the freight rate in hauling BTU's. It's natural you want to haul as many BTU's in a car for which you are paying, or in a ton. The more BTU's in the ton, the more economical [60] the price generally is.

MR. SIMS: Could I ask one question on voir dire?

Mr. Nicosin, are you testifying now from your memory or knowledge or what you previously told off the record?

THE WITNESS: I'm testifying from information that has been said to me by the coal company.

MR. SIMS: This is from your own knowledge, right?

THE WITNESS: Yes.

MR. SIMS: Okay.

Q Do you know why, Mr. Nicosin, the boilers at these Wisconsin utilities are able to burn only No. 3 seam coal?

A I am not sure they burn only that. They may be able to burn other coals, but they have seen fit to buy No. 3 coal for these boilers.

Q Mr. Nicosin, would you prefer for a new generating plant or an existing generating plant to be served by the full output of a given mine rather than half [61] of the output of three or four mines?

MR. SIMS: If in fact that is the only consideration he takes into account when he purchases his fuel?

MR. HEDLUND: All other things being equal.

A I didn't understand what he said. Try to phrase the question again, will you, please?

Q All other things being equal, would you prefer to be served by the full output of a single mine rather than the portion of an output of two or three mines?

MR. SIMS: Object as speculative and leading.

A I think that decision has to tie to that particular station. It's our thinking with Cayuga and in the future that you must have sufficient reserves to sort of guarantee your costs before you locate the plant. But I couldn't say that is true of every plant because some of our existing old plants are sharing mine outputs with other com-

panies. But from here on in we would like it that way. [62] Q Is Public Service of Indiana in competition with other fuels?

A Yes.

MR. SIMS: For what markets, counsel?

MR. HEDLUND: For its markets.

A Yes.

Q Approximately what percent of your business would you consider to be competitive, that is competitive with other energy or other fuels?

MR. SIMS: Object. This is irrelevant to the issues in the case.

MR. CAMPBELL: Off the record.

MR. FUTTERMAN: I'm going to object to this. This is Mr. Nicosin's deposition, and I think that Mr. Nicosin should testify from his own knowledge and not from knowledge that you may have, sir.

MR. CAMPBELL: Well, we can start objecting here, too, then.

MR. HEDLUND: Are we on or off the record?

MR. FUTTERMAN: I made my objection [63] on the record.

MR. CAMPBELL: I'm just trying to expedite this thing. If we want to prove all this stuff, we can prove it, but I'm just trying to expedite it so we can get through here.

MR. SIMS: My only comment is that Mr. Hedlund is trying to prove it and not really you.

Q I will ask Mr. Nicosin what he knows of the extent to which the business of Public Service of Indiana is competitive with other fuels and energy sources.

A I know we are in definite competition with heating of houses, apartments, industries and so forth. We are in competition with industries that need that type of energy. I don't know what our percentage is, but I do know there is definitely serious competition.

Q Would it be over 50 percent of your business?

A I would guess so.

Q Have you in the past, let's say five years, acquired customers who were previously generating their own electricity by burning coal?

A Yes.

[64] Q Do you have an opinion as to whether or not the market for coal in self-generation units other than utilities has remained the same, has increased or has declined?

A It has declined.

Q In the past five years have you lost any customers to the self-generation of electricity by oil?

A You're asking did they quit us and start generating their own by the use of oil?

Q Either leave you or in the construction of a new plant put in their own self-generation with oil rather than buying the electricity from you.

A I don't think I can answer that. That isn't my line of the business. You'd have to ask the Marketing, because I am not aware, fully aware, of all the new customers that they have dealt with and what type of energy they started using.

Q Finally, Mr. Nicosin, I would like to read you a statement and ask whether or not you agree or disagree or don't know or can't answer, and you can make as full an answer as you wish, please.

The statement is as follows: "Coal consumers differ in their requirements for particular [65] types and quantities of coal, and transportation costs constitute a large portion of the delivered price of coal. Consequently, the nature and extent of competition in the coal industry must be determined with reference to the requirements and location of specific coal consuming facilities, vis-a-vis, the production capability and location of specific mines."

A Yes.

MR. SIMS: I am going to object to that. I don't think Mr. Nicosin is in a position to say what all coal consumers would need. He is only an electric utility consumer. For that reason he is not qualified to give an answer to that.

A I would say the coal consumers that I know, the answer is yes.

Q Do those include more than utilities?

A Yes.

MR. SIMS: Object as hearsay and move to strike the answer.

MR. HEDLUND: You may inquire.

* * * *

[69] Q I think you testified earlier that your Cayuga plant was built with a letter of assurance from a coal company to provide coal for this plant for the duration of its life.

[70] A For 30 years, which is the greater part of its life.

Q But isn't it a fact that for the other coal generating stations that they are supplied by more than one coal producer?

A Yes.

Q Does the present presence of coal deposits and mines in Illinois and Kentucky serve as a restraint on the prices that Indiana coal producers can charge you?

MR. HEDLUND: May I have that question?

(The Reporter read back Q289)

MR. HEDLUND: I don't understand the question. I object to it as being not understandable.

Q Do you understand it?

A I'm not sure that I do. Again I think the answer would be no, in that transportation is such a big chunk of it, I don't see how a mine—

Q Assuming, though—

MR. HEDLUND: Wait a minute. Let him finish his answer.

[71] A I don't see how mines way over on the other side of Illinois puts any restraint on Indiana.

Q I didn't qualify it to say way across Illinois. I just said coal in Illinois or Kentucky.

A Well, coal in Illinois adjacent to the Indiana line, yes.

Q And coal in Kentucky adjacent to the Indiana line?

A Yes.

Q Don't you know for a fact that coal from Illinois does come into Indiana to serve coal consumers in the state?

MR. HEDLUND: Why don't you ask him if he knows that to be a fact, rather than arguing?

Q Do you know that to be a fact?

A I know it to be a fact that there is Illinois coal going into the generating stations in Northern Indiana Public Service Company.

Q Did you not also consider the presence of coal fields around the Danville area in Illinois as a possible future source of coal?

A Yes.

* * * *

[74] Q Could you alter the contract in some manner to use coal in this area if you could get an offer?

A The contract is with Old Ben Coal Company, and if Old Ben Coal Company has any properties any place that they can supply a cheaper coal to Noblesville, we will take it under that contract. Otherwise, they have to let us out of that contract to buy from somebody else.

Q Assuming they would let you out of the contract, could you purchase coal in this area more cheaply?

A Not in the Universal area. We have investigated coal mines near Noblesville like the one at Chinook at Staunton. Again when you get into three railroads involved, we couldn't ship it any cheaper from Chinook to Noblesville than we could from the other mine. Now, these kind of things can happen, if you can find a cheaper source, then your contracting supply can buy it from the other guy and sell it to you, which could still help you come out with a lower delivery price. But we have not found a more economical source for Noblesville.

Q Do you know what the average overburden is that Peabody is mining the coal?

[75] A At Universal?

Q At Universal.

A The average I would guess is probably 90 feet.

Q When the Noblesville plant was built in 1950, was this considered uneconomical distributed strips?

A Yes, I would guess in 1950 fifty to sixty feet overburden was average.

Q I think you testified earlier that there were three different coal companies supplying your Gallagher plant.

A Yes.

Q Ayrshire, Peabody, Pittsburg & Midway?

A That's in 1967. There's a fourth in there now this year.

Q Who is the fourth one?

A Island Creek.

Q From what mine are they supplying?

A I believe it's called Hamilton mine in west Kentucky near Uniontown.

Q Why did you start purchasing from Island Creek?

A The other three suppliers in the year of 1968 had difficulty in fulfilling the shipping requirements. They were not able to give us the amount of coal [76] we needed. This caused us to look for an additional source to build up our storage.

* * * *

[77] Q And then each time it is decided a new unit will be constructed, all grades of coal theoretically are in the running for the fuel requirements of that [78] boiler at that time?

A Generally speaking.

Q And you testified earlier, I think, that Peabody blended three different veins of coal in order to meet the requirements of a particular boiler, did you not?

A Yes.

Q Some coals can be blended by a particular coal producer to handle a boiler?

A Yes. And I might say if you go back a number of years, back when we had old chain grate boilers or different style boilers, they could handle a wider range of coals. But with the competition the type of boiler that we are now building has narrowed that margin down. In other words, they used to build a greater safety factor in the boiler.

Q Do you know from your own knowledge what are the major costs today a railroad incurs in shipping coal, in the total cost of shipment just where the prime costs are located?

A Prime costs are what they call terminal costs. That is the originating source and the terminating [79] source,

in that there is more time involved in assembling and making up a train and getting it moving, and there is more power required to get a loaded train in motion.

• • • •

[81] Q Where do you own coal reserves?

A We own approximately 40,000,000 tons of deep mine coal in Vigo County and we own approximately twenty to twenty-five million tons in Knox County.

Q And you contract this coal out to be mined?

A No, it's held in reserve.

Q For what purpose?

A For the purpose of consumption if other coal is not available, and also for the purpose of maintaining competition.

Q Where is the location, again, in connection with the state?

A Vigo County; 40,000,000 tons in Vigo County. That's in the Terre Haute area, western part. Twenty to twenty-five million tons in Knox County in the Vincennes area.

Q Well, there is a possibility, though, that some time at a future date you would mine this coal to be used in a generating station?

A Yes, there is a possibility.

• • • •

[85] MR. HEDLUND: In Chicago now we've got more ballparks than horsebacks.

THE WITNESS: That's for sure.

Q One last question. I think this is the last one.

Have you installed certain facilities in some of your generating stations to handle one air pollution pollutant, that is dust?

A In some stations; not in all. The Dresser station was built back in the twenties. They didn't know what you were talking about back then.

MR. SIMS: We have no further questions at this time.

REDIRECT EXAMINATION

QUESTIONS BY MR. HEDLUND:

Q Mr. Nicosin, why didn't you direct Combustion Engineering to design boilers for your Cayuga plant that could burn any grade of midwestern coal?

A To burn any grade?

Q Yes.

A It's an impossibility to design a boiler to burn any grade. You're talking about a range within an area of 50-mile radius. We came up with 22 kinds [86] of coal that we studied before the boiler was designed or the kind of coal was selected.

Q Then I misunderstood your previous testimony on cross-examination. I thought you said that a boiler can be designed to burn any midwestern coal.

MR. SIMS: No, excuse me. The question was could it be designed for any grade of coal, to burn any grade of coal.

Q Well, did you understand that question to be to mean any particular grade of midwestern coal?

A No, I didn't understand it that way. I thought he said in one boiler you could just put any kind of coal in this boiler you want and it will burn. My answer was no. You can design a boiler for any specific coal.

Q But you cannot design a boiler that will burn each and every kind of midwestern coal?

A It may burn it but not efficiently or not to maintain capacity.

• • • •

[88] MR. HEDLUND: No further questions.

MR. SIMS: We have no further questions but one proposition. We note in the deposition that the defendant has made reference to the Steam-Electric Plant Factors, and we would like to know if the standing stipulation applies to this document?

• • • •

[3]

EXCERPT FROM DEPOSITION OF WILLIAM D. STIEHL, TAKEN MAY 20, 1969

* * * *

WILLIAM D. STIEHL,

called as a witness by the defendants herein, having been first duly sworn, was examined upon oral interrogatories, and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name and home address.

A William D. Stiehl, 406 McKinley Drive, Belleville, Illinois.

Q Are you appearing for your deposition this morning pursuant to subpoena, Mr. Stiehl?

A Yes, sir.

Q Mr. Stiehl, please state your current employment.

A Well, I'm an attorney practicing in Belleville and am President of Belle Valley Coal Company, Inc., also located at Belleville, Illinois.

Q How long have you been with the Belle Valley Coal Company?

A Since about 1956.

[4] Q How did you happen to join Belle Valley Coal Company?

A Well, it's a family business. My father became an invalid in 1956 and I became active in the management at the time and have been ever since.

Q How many mines does the Belle Valley Coal Company operate?

A At this time only one.

Q Where is that located?

A Belleville, Illinois.

Q Is that a strip mine or deep mine?

A It's a deep mine with a slope shaft.

Q At about what depth are you currently mining, Mr. Stiehl.

A At the foot of the slope it's 62½ feet, they tell me, with a 300-foot slope. The depth of the coal varies from this 62½ feet down to as deep as 125 feet. Presently we are in an area between 120 and 125 feet.

Q Mr. Stiehl, what seam or seams are you mining at Belle Valley?

A Number 6.

Q What is the approximate annual production of the Belle Valley Mine?

[5] A Well, it varies, but approximately 120,000 to 130,000 tons.

Q Do you have a washer and sizer at the Belle Valley?

A Yes, we do.

Q Are there any rail loading facilities at your mine?

A Yes, there are. We are on the Louisville & Nashville Railroad and have a spur.

Q Do you use the railroad in the transportation of coal mined at the Belle Valley?

A We do not do so now, nor have we done so for a good many years.

Q How does most of the coal move from the mine?

A By truck.

Q Does your company own the trucks which are used?

A We do not own any trucks used in the delivery of coal, and haven't owned any for that purpose for quite a few years.

Q What trucks are used to transport the coal, then?

A Trucks belonging to individual trucking contractors.

[6] Q By whom are they employed?

A In some cases they are trucks owned by individuals and that is their sole business. In other cases they are trucks owned by various trucking companies.

Q By my question, I meant who contracts for them to move the coal? Do you do that or does the buyer?

A Both. There are instances of each.

Q I see.

Mr. Stiehl, to what type of customers does Bell Valley sell the coal which it produces?

A Well, we sell both wholesale and retail. We sell to power companies, to federal installations, to city installations primarily in St. Louis. We sell to manufacturing

concerns, we sell to some retail users. By that I mean domestic users. That is a very small part of the business any more.

Q Who specifically are some of the customers to whom you sell?

A Well, Scott Air Force Base, which is located in Illinois, Granite City Army Engineering Depot in Granite City, Illinois; Illinois Power Company, a plant at Alton, Illinois; Union Electric at both Venice, Illinois and Ashley Street in Missouri. We sell to City Hospital in St. Louis. Those are, of course, all governmental [7] agencies or utilities, and in addition to that we sell to assorted manufacturers primarily in the St. Louis metropolitan area. If you want an enumeration—

Q No. I think that gives us a good representative cross section.

Where generally are these customers located to whom you sell?

A In the metropolitan St. Louis area.

Q Since you have been President of the Belle Valley Coal Company, has Belle Valley sold any coal to customers located in Indiana?

A I don't believe so, no. I don't recall ever selling any coal in Indiana.

Q Have you ever sold any coal, to your knowledge, in Western Kentucky?

A No.

Q What about such areas in Illinois as Peoria and Joppa?

A Peoria and where?

Q Peoria and Joppa.

A Not to my recollection, no.

Q For what purpose do the customers who purchase coal from you use the coal which they purchase?

A Well, it depends upon the customer. In the [8] case of utilities, for the generation of power. Some of the customers use it for heating, some for use in their manufacturing process.

Q Does Belle Valley sell any of the coal which it produces on a contract basis?

A Yes.

Q For how long a duration are these contracts?

A Nearly all of them are on a one-year basis. None of them are in excess of a year.

Q What methods do the federal government facilities which you described earlier use when they buy coal?

A They buy on an annual contract.

Q What is the procedure which they follow?

A Well, there is a written invitation for a bid. The invitation specifies the facility that will use the coal, specifies the size or type of coal, it specifies the minimum analysis required, and it specifies delivery, a delivery schedule.

Q Suppose someone were to submit a bid which offered coal which failed to meet one of the analysis specifications set forth in the invitation to bid. What would happen to that bid which was submitted?

MR. FUTTERMAN: I object to that question as [9] being a hypothetical.

MR. KEMPF: I know of no rule in federal procedure which prohibits the asking of hypotheticals such as the one I have posed, and I ask Mr. Stiehl to answer the question.

MR. FUTTERMAN: Are you trying to qualify Mr. Stiehl as an expert of some sort so you can ask him hypothetical questions?

MR. KEMPF: I am asking this hypothetical on the basis of the deposition evidence he has given thus far in his deposition this morning. I think on that basis he is qualified to answer this question.

MR. FUTTERMAN: I suggest to you, Counsel, that you can ask Mr. Stiehl what he knows or what has happened, but not speculative questions.

MR. KEMPF: I do not think this question is speculative, Counsel.

I will ask the reporter to re-read the last question for the benefit of the witness and myself.

Q (Read by the reporter.)

MR. KEMPF: You may answer.

MR. FUTTERMAN: I will maintain my objection.

[10] BY THE WITNESS:

A The Government would not accept the bid.

MR. FUTTERMAN: Counsel, I would like to point out at this point that this line of questions was directed to the government agent who was directly responsible for coal.

MR. KEMPF: Counsel, is this your deposition or Mr. Stiehl's? I think the prior deposition testimony will speak for itself, and if you wish to argue some point to the Judge or in a brief at some future date, I suggest you do it then and not during the course of this deposition.

MR. FUTTERMAN: I would like to complete my statement.

MR. KEMPF: Do you have an objection? If you have a statement, it is out of order.

MR. FUTTERMAN: In connection with my objection—

MR. KEMPF: In fact, the reason I was objecting to your statement was the fact that it was a statement and not an objection, and clearly so. Indeed, you so characterized it yourself.

MR. FUTTERMAN: I would like to object to this line of questioning on the ground that you have [11] already gone into this with the person most knowledgeable about this aspect of government coal buying, and you have continuously throughout the course of these depositions objected to questions that we have posed on the ground that they were better asked of people who were more knowledgeable about the subject matter. I would suggest to you that you have already had that opportunity in connection with purchases of coal by government installations.

MR. KEMPF: I think the record will demonstrate the witness' qualifications to answer this question, and I think the record from prior depositions will show the basis on which I have objected to certain questions. I would now like to continue the taking of this deposition.

BY MR. KEMPF:

Q Mr. Stiehl, could other customers also take account of size and quality characteristics in buying coal?

A Yes, to varying degrees.

MR. FUTTERMAN: I object. Would you explain what you mean by "quality"?

MR. KEMPF: The witness has already answered the question.

[12] BY MR. KEMPF:

Q Did you understand what I meant by the word "quality", Mr. Stiehl?

A I thought I did, yes.

Q Mr. Stiehl, does the Belle Valley Coal Company sell any coal on open account?

A Yes.

MR. FUTTERMAN: I would like to ask on voir dire what "open account" means.

BY MR. FUTTERMAN:

Q Mr. Stiehl, what do you understand the term "open account" to mean?

A My understanding of "open account," if I may put it this way, is when a customer either comes to our mine or calls us and requests coal of a certain size as opposed to a bid of coal for their purposes.

BY MR. KEMPF:

Q Mr. Stiehl, at the current rate of production, how many years of reserves does the Belle Valley Coal Company approximately have?

A Approximately eight to ten years.

Q Are you in the process of looking for other reserves to mine after the reserves at the Belle Valley Mine are exhausted?

[13] A I have to answer your question in this way: We are in the process of looking for other reserves, not necessarily to be mined after these are exhausted, but perhaps prior to the exhaustion of these.

Q Are these contiguous with the reserves at the existing mine location?

A Yes.

Q What about reserves in new fields?

A Well, we really have no interest in any reserves in any other fields. When our reserves are finally exhausted, I would not anticipate that we would continue in the coal mining business.

Q Mr. Stiehl, are you familiar with the St. Louis air pollution ordinance generally?

A Generally, yes.

Q Will this ordinance have any effect on your business once it is in operation?

A Yes, sir.

Q What will that be?

A Well, it will affect us in that we will have to make a determination of what course we are going to pursue. At this point it appears to me that we have three courses or three choices.

Very obviously, one is to look for different [14] markets, a market outside the area where this smoke abatement ordinance may be in effect.

Secondly, we can choose to try through technological improvement to reduce the amount of sulfur, to improve the quality of the coal so that it meets the St. Louis standards.

Our third alternative, or third choice, is to close down the mine. Whether or not we choose to follow the second route very obviously depends upon the amount of investment it will take to effect these necessary improvements. We are in the process of trying to make these determinations now, but we haven't reached any conclusion as yet.

Q I see.

Is your business faced with competition from other fuels, such as gas, oil and purchased electricity?

A Very definitely. They have had quite an effect on the coal industry.

Q Do you have any examples where it has had a specific effect on your business?

A I have as many examples as you have time, I suppose. For example, in this immediate area, we formerly supplied, we were the largest supplier, and by that I mean we had most of the business, to users such [15] as Belleville city facilities, City Hall, et cetera; the St.

Clair County facilities; the Court House, detention home, all of their various facilities; Belleville public schools, grade school, high school, and other schools in the area.

We also formerly, and of course this has been something that has dropped off over the course of years, supplied a great deal of coal to domestic users such as private homes, small manufacturing plants, things of this nature.

Q These facilities which you have mentioned, such as the City of Belleville facilities and St. Clair County facilities, what do they now use as fuel?

A Most of them use gas. My recollection is that almost all of these have gone to gas, but I may be wrong in one instance or two, but most of them have gone to gas.

MR. FUTTERMAN: On that basis I will move to strike those answers on the ground that you had best find out that information from the St. Clair County people in charge of procuring fuel for the St. Clair County facilities, and also for the local Belleville facilities.

[16] BY MR. KEMPF:

Q Mr. Stiehl, do you know of your own knowledge that most of these facilities have, in fact, shifted to gas?

A I certainly do, and if you want to go through them item by item, I think I can tell you in each instance. I was trying to give you a general answer before.

Q I do not think that will be necessary.

Has the fact that both United Electric and Freeman have been controlled by General Dynamics had any adverse effect on the Belle Valley Coal Company?

A None that I know of.

MR. FUTTERMAN: May I have the last question and answer read back, please?

(The record was thereupon read by the reporter as above recorded.)

BY MR. KEMPF:

Q How would you characterize the degree of competition at the present time in the coal industry?

A Well, it has been my experience, since I have been involved in the business, that it is a very competitive

business and remains so today. At least, it's very competitive for us. I don't know about for other people.

[17] Q Will there be any adverse effect on Belle Valley Coal Company or competition in the coal industry if General Dynamics is allowed to continue owning both Freeman and United Electric?

A I know of no adverse effect that it would have on our company. Obviously, I can't speak for the rest of the industry.

Q Would there be any benefit to Belle Valley Coal Company by forcing Freeman and United Electric to operate independently of each other?

A I know of none.

MR. KEMPF: I have no further questions at this time.

MR. FUTTERMAN: Would you read the last question and answer back, please.

(The record was thereupon read by the reporter as above recorded.)

MR. KEMPF: Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)
(There was a short recess taken, after which the taking of the deposition was resumed, as follows:)

[18] MR. FUTTERMAN: Back on the record.
I have just a few questions, Mr. Stiehl.

CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Isn't it a fact that on certain occasions Belle Valley Coal Company has bid against larger producers to supply coal to particular consumers?

A Yes, sir.

Q It is also a fact, is it not, that on some occasions Belle Valley has been successful on these bids and has been awarded contracts?

A Yes, sir.

Q Mr. Stiehl, since you have assumed the presidency of Belle Valley Coal Company, have Belle Valley's operations been profitable?

A Over the course of these roughly thirteen years, yes. There have been a few years when they were not, but on balance they have been.

Q Mr. Stiehl, you stated during your direct examination that none of Belle Valley's contracts were in excess of one year. Do you know who can enter into contracts for longer than one year, and by that I mean which coal producers?

[19] A Producers, or users?

Q Producers.

A Well, any producer including ourselves can, if we are able to meet the requirement. This is the limitation on our little mine is that we cannot, in many cases, meet the requirement of so many tons per year over so many years. If a producer is able to meet the user's requirement, then of course he can. Is your question directed to specific producers? Are you asking for specific companies?

Q Well, it was a general question.

A O.K. That's why I gave you a general answer. That is what I thought you wanted.

Q To make the question more specific, would you be able to name producers who could enter into contracts in excess of one year?

A Oh, I think I could. I think I'd be safe in naming any large coal mining company. For example, Peabody Coal Company. I have read various articles in the public press as well as in trade journals about long-term contracts they have had to supply coal, for example, to TVA and to other users. The same is true with many of the other large companies. For example, the companies that you are concerned with here are, I [20] am sure, able to supply on long-term bases as well as any other large company.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF THOMAS N. WARD, TAKEN MAY 28, 1969

* * * *

MR. HEDLUND: Who will be conducting the cross examination for the Government?

MR. SIMS: I will.

MR. HEDLUND: Mr. Ward, during your examination should I ask any questions or should Mr. Sims ask any questions that you do not understand, please indicate that and we will try to make our questions clearer. Sometimes we think we know what we are talking about, but it is not clear to the person who is being questioned.

Also, in the event that I interrupt you before—I will try not to do this—but if I interrupt you before you have finished your answer, please tell me that and give a complete answer.

THOMAS N. WARD

called as a witness by the defendants herein, having been first duly sworn by the Notary Public, was examined upon oral interrogatories, and he did thereupon depose and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Will you state your name and present business [4] affiliation.

A My name is Thomas N. Ward. I am Vice President, Secretary and Treasurer of Ohio Valley Electric Corporation and its subsidiary, Indiana-Kentucky Electric Corporation.

Q Are you present at this deposition pursuant to a subpoena that has been served upon you?

A Yes, I am.

Q Will you briefly state your educational and business background.

A I am a graduate of the University of Illinois, graduating in February of 1947 with a major in accounting, B.S. in business administration. Following graduation I was employed by the New York office of the public accounting firm of Arthur Andersen & Company. I worked for Arthur Andersen & Company primarily specializing in utility audits for approximately eight years. Following this period of time I was employed by my present employer. I am also a certified public accountant for the States of New Jersey and Ohio.

Q Could you briefly describe the responsibilities of your present position with Ohio Valley Corporation and Indiana-Kentucky Electric Company.

A My primary responsibilities in my present [5] position relate to managerial functions, and also I act as head of the Accounting Department, which includes the treasury function.

Q What responsibilities do you have with respect to the purchasing of coal by Indiana-Kentucky Electric and the consumption of that coal by the company?

A My responsibilities in connection with the purchase of coal are meager. Our coal purchasing has historically been handled principally by the President of the corporation. This was Mr. Philip Sporn, who was President until a little over a year ago.

However, I do have the responsibility for administration of the coal contracts in effecting payment for purchases thereunder.

Q For how long was Mr. Sporn president of Indiana-Kentucky?

A Mr. Sporn was president of the corporation from its beginning in 1952 until his retirement in 1967.

Q What other positions did Mr. Sporn hold, say, between 1960 and 1967 with respect to other companies, if you know?

A He was president of all operating companies of American Electric Power Corporation.

[6] Q Do you know whether American Electric Power Corporation is the largest investor-owned utility in the country in terms of kilowatt generation capacity?

A It is one of the largest. I do not know whether it is the largest.

Q Who took direct responsibility between 1952 to the present for negotiating the coal contracts entered into by Indiana-Kentucky?

A This function was primarily performed by Mr. Sporn.

Q He was during that period of time, as you have stated, the president?

A President, yes.

Q Would you briefly describe the history and background of Indiana-Kentucky and its parent Ohio Valley?

A Early in 1952 the government of the United States approached the utility companies in the Ohio River Valley area concerning the possibility of supplying a large block of power to a proposed gaseous diffusion plant to be operated by the United States Atomic Energy Commission. Following these initial inquiries, a group of ten companies, which comprise many of the utilities in the Ohio, Indiana, Pennsylvania [7] area, agreed that a separate corporation could be formed to supply the AEC their needs for power and energy.

At this time in our history the amount of power required by this proposed facility represented approximately one-third of the power consumed by the State of Ohio, within the State of Ohio. The Ohio Valley Electric Corporation and its subsidiary were formally organized in October, 1952.

Q Let me interrupt you. Is that "formally" or "formerly" organized?

A They got their charters.

Q That is what I mean. I'm sorry. Please continue, Mr. Ward.

A Following this organization, and incidentally there was a desire at this time for the generating stations to supply this block of power to be strategically located in different geographic areas. As you will recall, during this period of time we were in the Korean conflict, so obviously it was not desirable to locate one large station which would supply the electrical requirements of the gaseous diffusion plant in one central location. Accordingly, sites were selected for two generating stations, one generating [8] station known as the Kyger Creek Sta-

tion, located north of Gallipolis, Ohio. The other generating station was located in Madison, Indiana. Because of state laws, the station located in Madison, Indiana, it was found more feasible to have this in a separate corporation, Indiana-Kentucky Electric Corporation, organized in the State of Indiana.

Q Does that mean, then, that the facility in Madison, Indiana, is owned by Indiana-Kentucky Electric Company?

A Yes. The Clifty Creek generating station of Indiana-Kentucky Electric Corporation, of which the stock of Indiana-Kentucky Electric Corporation is 100 percent owned by Ohio Valley Electric Corporation, and further, Ohio Valley Electric Corporation purchases all of the generating capacity of the Clifty Creek Station.

Q Ohio Valley, then, sells this electricity to whom at the present time?

A Ohio Valley Electric Corporation sells the power and energy purchased from its subsidiary along with the energy produced from the Kyger Creek Station to principally sixteen customers. Initially, the prime customer was the Atomic Energy Commission. Since the mid-fifties, as we might know, the energy [9] requirements of the Atomic Energy Commission have been reduced. While their initial contract was for 1,800,000 kilowatts, their present contract capacity is 500,000 kilowatts. The power and energy not sold to the Atomic Energy Commission is, in turn, sold to fifteen sponsoring companies of Ohio Valley Electric Corporation. The sponsoring companies are either the stock holding companies of Ohio Valley Electric Corporation or subsidiaries thereof.

Q With respect to Clifty Creek, at the present time what percent of the power generated there is purchased by the AEC?

A I'm not so sure that we can actually give a percent of the power from Clifty Creek Station because this power all goes into an interconnected system. Clifty Creek Station is comprised of six 230-megawatt generating units. Kyger Creek Station has five generating units of the same size. So, the total capacity is eleven

units of 230 megawatts gross which would produce a net of approximately 215,000 per unit.

Q 215,000 megawatts?

A 215 megawatts.

Q I'm sorry.

Can you give a percentage of the power generated, [10] then, by both Kyger and Clifty Creek that goes to the AEC?

A At the present time?

Q Yes.

A It would be the relationship of 500 megawatts to a total capacity of 2,365 megawatts.

Q What is the generating capacity of the Clifty Creek Station?

A 1,290 megawatts net generation.

Q You have indicated that Clifty Creek is in Madison, Indiana. Could you give us a better geographical fix as to where that is?

A Madison, Indiana, is approximately midway on the Ohio River between Cincinnati, Ohio, and Louisville, Kentucky.

Q In what year did Clifty Creek reach its full generating capacity?

A Well, the station was completed on March 12, 1956. That was the date at which the last or sixth unit was placed in commercial operation.

Q Do you recall when construction of the plant began?

A Construction of the plant—I assume you're referring to the initial commencement of construction?

[11] Q Yes.

A The latter part of 1954. In other words, basically during the year of 1955 the generating station construction took place.

Q Approximately how many tons of coal per year does Clifty Creek consume?

A Clifty Creek Station itself consumes approximately four million tons of coal per year.

Q What facilities does Clifty Creek have for the delivery of coal to the plant?

A It was decided following the location of the plant that coal for the generating station would be delivered

by barge. Factually, we have no facilities for handling rail or truck delivery. Obviously, of course, a truck could drive onto the coal pile and dump the coal, but this is not the procedure under which we planned to receive coal. We estimate that the consumption of coal at Clifty Creek Station approximates 11,500 tons per day.

Q It would take a lot of trucks to provide that much each day, would it not?

A Yes, and the rail facilities—we have rail facilities within the plant site, primarily for the delivery and shipping out of major large pieces of [12] equipment, but no coal handling facilities such as car dumpers, this type of equipment.

Q Over the past two or three years, what was the approximate delivered cost per BTU of coal consumed at Clifty Creek?

MR. SIMS: From all mines, Counsel?

MR. HEDLUND: Yes. I am asking for the average cost experienced by the plant for all coal purchased.

BY THE WITNESS:

A All coal purchased at Clifty Creek Station has been delivered at an approximate cost of 19½ cents per million BTU.

Q When Clifty Creek was completed, do you know how it ranked in generating capacity in the United States?

A To the best of my knowledge, Clifty Creek was the then largest generating station in the United States.

Q To your knowledge has the Clifty Creek Station ever consumed coal produced in the State of Illinois?

A To my knowledge they have not.

Q Do you know why that is?

[13] A It would be my belief that coal was not purchased from Illinois because of the shipping distance that would be required to acquire such coal and deliver it to Madison, Indiana. It would be my thought that the barging rate would be significant enough to preclude Indiana-Kentucky Electric Corporation from purchasing.

Q What new coal contracts have been entered into by Indiana-Kentucky for the Clifty Creek Station?

A The initial coal contracts for the generating station were contracts of approximately fifteen years' duration. We are now approaching the termination date of the original contracts.

Prior to Mr. Sporn's retirement, he felt that Ohio Valley Electric Corporation and its subsidiary Indiana-Kentucky Electric Corporation were entering what one might call their second phase of operation. It was his desire to firm up the coal requirements for the next approximately 15-year period prior to his retirement. During the latter part of 1968 substantial contracts were entered into with one of our present suppliers, Ayrshire Collieries Corporation, and a significant contract with a new supplier, Island Creek Coal Company. These contracts recently entered into will have also approximately a 15-year term.

[14] Following the expiration of these contracts which occurs in the early 1980's, it will then be necessary to ascertain the expected future life of the generating stations to determine what coal requirements will be for the then remaining period of expected generation.

Q What is the present expected life of this generating station?

A Under our contractual terms with the Atomic Energy Commission, the cost of plant facilities are being written off over a period of 25 years from March 12, 1956. Therefore, our plant capacity will be fully depreciated on the corporation's books by March 12, 1981. The present day expected life of generating capacity, as published in the Internal Revenue Service Guidelines, as I recall, is 28 years.

Q What present plans do either Ohio Valley or Indiana-Kentucky have for expanding or replacing the generating capacity of the Clifty Creek station?

A We have no present plans for expanding at Clifty Creek Station or at the Kyger Creek Station of the parent company. The stations were built for a specific purpose of providing energy to the Atomic Energy Commission, and these contracts were not [15] negotiated with any growth potential in the corporations.

Q Do Ohio Valley or Indiana-Kentucky have any pres-

ent plans to replace either Clifty Creek or Kyger at the end of their useful lives?

A We have no plans for any such replacements. As a matter of fact, this also is governed somewhat by our contract with the Atomic Energy Commission, wherein any replacements of property having a cost in excess of $100,000 must be formally approved by the AEC before any such replacement takes place. This, obviously, is a control feature of the Government, because in our contractual arrangements with them, they reimburse the corporation for the cost of replacements.

Q With respect to the new contract of Ayrshire, what is the length of that contract and the approximate tonnage that will be shipped each year.

A The contract with Ayrshire Collieries is approximately a fifteen-year contract, providing for 800,000 tons per year, plus or minus fifteen percent. The reason for the plus or minus fifteen percent relates to a flexibility factor which we feel we must have in order to effectively regulate the need for fuel as related to the requirements of either AEC or the sponsoring companies.

[16] Q From what mine or mines of Ayrshire will this tonnage be shipped?

A From Ayrshire the tonnage will come from the Wright Mine, with a loading point at Yankeetown, Indiana.

Q How will that coal be transported from Yankeetown to Clifty Creek?

A By barge.

Q With respect to the contract with Island Creek, what is the duration of that contract?

A The contract with Island Creek is also for an approximate term of fifteen years with an option available to the corporation of extending it for another five years. This coal is being purchased from a new mine known as the Hamilton No. 1 Mine located near Uniontown, Kentucky. This coal is deep mine coal coming from the West Kentucky No. 9 seam.

Q Approximately how many tons of coal will be shipped each year out of that mine by Island Creek to Clifty Creek?

MR. HEDLUND: Perhaps I had better restate that question.

BY MR. HEDLUND:

Q Approximately how many tons per year does your [17] contract with Island Creek call for?

A Our contract with Island Creek calls for two and a quarter to two and a half million tons per year.

Q If you know, was this mine opened by Island Creek for the purpose of complying with this contract?

A To my knowledge this mine was opened to supply Indiana-Kentucky Electric Corporation.

Q If you know, will the shipments out of this mine to Clifty Creek comprise virtually the total production of that mine?

A I can't answer this question.

Q Under these two contracts which you have referred to in your existing contracts, are you able to predict for the ensuing life of the plant what your approximate delivered cost per BTU, average delivered cost per BTU, will be at Clifty Creek in comparison to prior years?

A We would hope that the delivered cost will be approximately the same as that I have previously stated, around 19½ cents. Obviously, we have to realize that negotiations by the United Mine Workers and others will have an effect on this cost. Our contracts are subject to escalation from the base contract prices for such items as miners' wage increases.

[18] We did realize, in negotiating a contract with Island Creek, however, that it would not be subject to the costs of some other mines in connection with the strip mining laws of various states, where there are factors in the contracts providing for reimbursements for cost in connection with placing stripped mine areas back into a satisfactory condition.

Q Could you give us, sir, please, the details with respect to your testing, if you did this, of the Island Creek coal that is to be supplied under their contract.

A I believe it would be appropriate to mention here the testing we have done from the beginning at both generating stations in connection with the use of coal.

At the time we negotiated for the purchase of our boilers, of which there were eleven to be purchased, there were several generating units of the same size that we planned to install. These were located on the American Electric Power System. The generating units that I have previously mentioned were the then largest generating units available. This is the 215-megawatts net generation. Of course, in our present day technology these are now not the largest, [19] but at that time they were.

What we did was to actually send coal to the similar operating facilities and have the coal that we planned to purchase burned on a test basis. For example, in connection with the recent contract entered into with Island Creek, we did, in fact, during 1956, as you will note from the purchases from Island Creek during that period—

Q I am sorry. Did you mean to say 1956?

A '66. I'm sorry. 1966.

We purchased coal from Island Creek, which was primarily used for test purposes. This coal was not from the Hamilton Mine, which was going to supply us under the long term contract, but was from an existing mine, which was producing No. 9 seam coal. This was delivered to our Clifty Creek station and burned. The characteristics were satisfactory, that we could, in fact, burn it.

It is interesting to note, however, that we have run into a circumstance recently which has prompted us to reevaluate our test procedures.

Q Could you explain, please.

A On occasion recently because of the inability, because of flood conditions on the river or in the mines, [20] we received a substantial amount of coal from Island Creek. This was placed into our boilers and we encountered a severe fouling characteristic in the superheater section of the boilers, a characteristic we have never experienced. As I say, we tested this coal, and on approximately a 50-50 basis this coal burned very, very well.

Q I am sorry. What do you mean by "on a 50-50 basis"?

A Mixing the Island Creek coal with other coal.

The people at the generating station tell me that it somewhat has a characteristic like molasses, but when it is mixed it burns satisfactorily. We are now testing to determine what we have to do to adequately burn this coal. We know we can do it on a 50-50 basis. This we have proven.

We are making some modifications in our boilers to provide additional air capacity. In other words, we may not be getting adequate combustion in boilers. We have found, really, there is quite a bit of difference in coal.

I recall another experience at our Ohio plant where we bought some coal from a mine north of Wheeling, West Virginia, for the specific purpose of testing our [21] scales. All of our scales—the scales at our generating station are used as the basis for determining the tons purchased from the various suppliers, so it is absolutely necessary for us to go to as great an extent as possible to test these scales. We bought some test coal from this mine that I was mentioning, burned it in our boiler at Kyger Creek Station, and its characteristics were such that we had to take the unit off the line to get the slag to flow out of the bottom of the boiler. All of the boilers at both Ohio Valley Electric and Indiana-Kentucky Electric are what are term "wet bottom" boilers. In other words, the slag from combustion actually flows out the bottom of the boiler into the ash hopper.

Q You mentioned the fact that this Island Creek coal on a 100 percent basis caused fouling. Why is fouling a problem?

A Fouling is a problem because you don't get the correct exchange in your various superheater and reheater sections of the boiler, so you are losing efficiency.

Q Can it reach a stage where it is so severe that it requires you to shut down the unit altogether?

A Yes, it does.

[22] Q We may have covered this, but I want to make sure it is clear. What plans, if any, are you making that will permit you to burn this coal from Island Creek on a 100 percent basis?

A As I mentioned, we are installing what are termed wall blowers, which I have been told have the effect of

increasing the air capacity in the primary furnace. This is a timely test project which we do not have the results of at the present time.

Q Do you know whether this will be all you will need to do to burn the coal?

A No, we do not.

Q In the equipment at Clifty Creek, would it be possible for you to burn low sulfur coal?

A No.

Q Could you explain that, please?

A As I understand, the amount of sulfur in coal determines fusion temperature. The boilers at both of the generating stations of the companies I represent were designed to burn low-cost coal with a sulfur content of approximately five percent. As I understand—

Q Is that a maximum?

A It is in the area of five percent.

Q I see.

[23] A (Continuing) As I understand, low sulfur coal has a much higher fusion temperature which, if burned in our boilers, would have the effect of consuming the boiler tubes themselves.

Q Would it be feasible to convert or redesign the boilers at Clifty Creek to burn low sulfur coal?

MR. SIMS: Counsel, I do not think you have established a proper foundation for asking Mr. Ward this type of question. It would seem to me that this is an engineering consideration. It has been established that he is a certified public accountant.

MR. HEDLUND: I am asking for the extent of his knowledge, Mr. Sims.

BY MR. HEDLUND:

Q Would you like to have the question repeated?

A No.

We have had occasion to participate in discussion sessions with various state agencies in connection with the problem that utility companies face regarding emission into the air. In our studies we have found that to burn low sulfur coal it would be necessary for us to completely replace our boilers. In other words, we could not burn low sulfur coal in the type of boilers that we have.

[24] Q I would like to direct your attention to Form 175 submitted by Indiana-Kentucky under your signature in response to a subpoena issued by the Court in this case, and specifically to the answer to Question 9. Your answer is as follows:

"Not applicable."

I wonder if you could explain what you meant by that or what your intention was. I can show you my copy if that would be helpful.

A I have it. The reason that we stated "Not applicable" to Question No. 9 of—Form 175?

Q That is correct.

A (Continuing) —was that we cannot burn coal with characteristics significantly different than those specified in answer to Question 8.

Q Would it be feasible to redesign or modify your boilers to burn coal with characteristics significantly different than that indicated in answer to Question 8?

A Well, as I've mentioned, I've been informed that to burn low sulfur coal would require complete replacement of boilers. If economically our society can stand the cost of such replacement and we have the need for electric energy, obviously, of course, this would be feasible, but under present day thinking, it [25] would not be too practical, because, as you probably know, generating stations are designed for specific types of equipment. There is a certain amount of space allocated to the boilers themselves. New boilers may take greater space than that available or they could take less space.

Q I would like to direct your attention to Form 150 submitted under your signature by Indiana-Kentucky in response to the subpoena previously referred to, and specifically to Form 150 which reflects shipments in 1967 by the Uniontown Mine of Island Creek to the Clifty Creek Station of Indiana-Kentucky,—

MR. SIMS: Could you wait one second, Counsel, while we locate that?

MR. HEDLUND: I would like to finish describing the document.

BY MR. HEDLUND:

Q (Continuing) —the original of which is numbered at the bottom as 449.

MR. HEDLUND: Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. HEDLUND: Back on the record.

[26] BY MR. HEDLUND:

Q Mr. Ward, I direct your attention to Column C on the inner page of the document referred to where appears the figure 40.7, and ask you whether that figure is correct.

A That figure is not correct.

Q What should it be?

A The figure should be 4.07.

Q Mr. Ward, I will ask you to assume that the mines of the United Electric Coal Companies are located near Peoria, Illinois, that is, three of them are near Peoria, Illinois, and one is in Perry County, Illinois, and ask you to assume that the mines of Freeman Coal Mining Corporation are located near Springfield, Illinois, and three mines in the southeastern portion of the state in Williamson, Franklin and Jefferson counties, and to take into account your knowledge and experience with respect to coal purchasing and handling, has the common ownership of United Electric and Freeman had any adverse effect upon Indiana-Kentucky Electric?

MR. SIMS: I am going to have to object to this. He stated that his knowledge was meager in this area, and I do not see where it would really serve the purpose of the case to have his opinion [27] on this matter.

MR. HEDLUND: We will argue that in our briefs, Counsel.

BY MR. HEDLUND:

Q You may answer.

A Neither Ohio Valley nor Indiana-Kentucky Electric Corporation have ever purchased any Illinois coal. Neither do we contemplate purchasing any Illinois coal. I

would doubt that the mines in Indiana could compete—pardon me—in Illinois could compete with those in Indiana and West Kentucky, which are closer to our coal consuming facility, and I do factually know that the barging rate is a function of distance.

Q In light of that, then, has there been or will there be any adverse effect on Indiana-Kentucky?

A Not to my knowledge.

Q Can you conceive of any possible benefit to Indiana-Kentucky were the Court in this action to require the divestiture of the United Electric Coal Companies and to establish them as an independent coal producer?

A As I mentioned, I can see no effect on Indiana-Kentucky Electric Corporation. There obviously may be some effect in the coal industry.

However, we have to recognize in our present [28] day period that the coal itself is competitive with other fuels—pardon me—is in competition with other fuels. What I am referring to now is nuclear energy. When we started to think about the use of nuclear energy for the generation of electric energy, the differential at that time was a relationship of 35 cents a million BTU, coal cost. Nuclear stations were obviously, therefore, considered and located in areas where coal cost or fuel cost was high. This cost comparison of nuclear energy with other fuels has been lowered through technological advances, and as I understand, under some of the facilities now under construction, nuclear capacity is competitive at something in the area of 25 cents per million BTU coal. It is expected that this will improve as the various different methods of the use of nuclear energy are developed.

Another factor in this connection which I think we can't lose sight of is the current interest in controlling emission of various gasses and particles into the air. Consumption of coal obviously emits certain gasses, whereas in connection with the use of nuclear energy the emission is one of the thermal nature.

MR. SIMS: I will move to strike that part of his testimony which is not responsive to the [29] question.

MR. HEDLUND: I think it is clearly responsive, Counsel, and I will ask to have the question again.

MR. SIMS: Will you read back the question, please.

MR. HEDLUND: Will you read it back and then I will repeat it.

Why do you want it read back, Counsel?

MR. SIMS: You said it was clearly responsive.

MR. HEDLUND: We have no one here to rule on that, so what function will it serve by reading it back? You made your objection.

MR. SIMS: You said you were going to ask it again.

MR. HEDLUND: I am going to ask it again now.

MR. SIMS: Would you read the question back, please.

Q (Read by the reporter.)

MR. HEDLUND: I will ask that question again, if I may, and keeping in mind your prior answer.

MR. SIMS: I am going to have to object. You did not lay the proper foundation for asking Mr. Ward things of this sort.

[30] BY MR. HEDLUND:

Q Again, Mr. Ward, do you see any possible potential benefit to Indiana-Kentucky were the Court to require divestiture of United Electric as an independent company?

A I can see no benefit.

Q Of what importance, if any, to a utility the size of Ohio Valley and Indiana-Kentucky would be the acquisition by a coal producer of another company producing seven million tons?

MR. SIMS: I will have to object. That is speculative.

MR. HEDLUND: Again, asking for your opinion.

THE WITNESS: Would you repeat the question.

MR. HEDLUND: Would you please read back the question.

Q (Read by the reporter.)

BY THE WITNESS:

A In my opinion this would not be of any great importance because we have found that generally in the areas that we consume coal it is advantageous, obviously, not to be taking the entire production from a single company, nor a substantial part thereof.

• • • •

[38] BY MR. SIMS:

Q Mr. Ward, does the fact of constant demand make your company more conducive to long-term contracts?

MR. HEDLUND: More conducive than what? I don't understand your question, Counsel.

BY MR. SIMS:

Q Do you understand it, Mr. Ward?

A I think I can answer the question. Let me try.

Q Fine.

A I'm not so sure that the length of term of our contracts, for example, with the Atomic Energy Commission or the sponsoring companies, really recognizes or anticipates whether we should or should not go into long term versus short term contracts. It is my opinion that there are some distinct advantages to long term contracts. One, it assures supply when you are dealing with reputable mining companies. Two, it also enables mining companies, then, to purchase equipment for mining operations, and in some cases even pledge the receivable portion of the contract they [39] have on a long term basis to enable the finance of this equipment.

In other words, there are basically two sides to this. Obviously, if we were going to be in business for five years, we wouldn't enter into 15 year coal contracts, and if we didn't have a source to sell our power two years from now, we certainly would not want five year contracts, so the length of the contract is important, and also the factor of the price we are able to obtain from coal companies, in my opinion, would be somewhat figured on the basis of whether they had a long term or short term contract because of the amount of coal per consumer.

Q If you know, don't most electrical utilities have a peaking season where their demand is greater than in other parts of the year?

A Historically this has been so. As a matter of fact, historically electric utility peaks occur during the winter months. However, recently this has factually changed, whereas now the peaks are occurring in the summer months.

• • • •

[47] Q Isn't it also true that for mines supplying your plant in 1967, they were supplying coal with sulfur ranging from about three to five percent?

A Yes, yes.

Q What would be the purpose of stating in a contract that a coal supplier has to furnish coal with an ash of, let's say 8.5 percent, a moisture of, let's say, 10 percent, if, in fact, your equipment can use coals with a higher ash or lower ash or higher or lower moisture content?

MR. HEDLUND: May I have that question back, please.

Q (Read by the reporter.)

MR. HEDLUND: All right.

BY THE WITNESS:

A The reason for these specifications in the contract provisions are to enable a corporation to have the option of either accepting or rejecting coal which varies from these characteristics. We obviously don't want to contract for coal if we're going to end up handling ashes to an excessive degree. In other words, this gives you options to accept or reject deliveries.

* * * *

[48] Q If it were the same price, is that right?

[49] A Yes, yes.

Q If the inferior coal was at a much lower price and you could burn this coal with a minimum problem in the boiler, would it be a possibility to buy this coal?

A It would be, yes.

Q Have you ever used gas in your Clifty Creek station?

A We have never used gas.

Q Have you ever had any discussions with gas companies about the price of gas?

A No, we have not.

Q Why is this?

A Because, obviously, I cannot see how gas could be competitive with barge-delivered coal.

Q Could you be more specific in terms of price between the two fuels?

MR. HEDLUND: Are you speaking now from Clifty Creek?

MR. SIMS: Clifty Creek.

MR. HEDLUND: You are speaking of the comparison between gas that might be available at Clifty Creek and barge-delivered coal?

MR. SIMS: That is correct.

[50] BY THE WITNESS:

A Obviously, if natural gas were available at Clifty Creek Station at 20 cents a million BTU's, first of all, we could not burn it. We don't have the burner capacity, facilities, to burn it, so really, no, we have never investigated purchasing gas.

BY MR. SIMS:

Q To your knowledge has natural gas been available at any time since your plant started up, since 1956?

MR. HEDLUND: At Clifty Creek?

MR. SIMS: At Clifty Creek.

MR. HEDLUND: Available physically or at cost?

MR. SIMS: First, let's say available physically.

BY THE WITNESS:

A To my knowledge, gas in quantities that we would consume at Clifty Creek Station would not be available without additional pipeline capacity.

BY MR. SIMS:

Q Have you ever considered oil as your prime fuel in this facility, Clifty Creek?

A We do use oil at Clifty Creek Station, primarily for start-up and also during low load [51] conditions for maintaining the fire. This is the only use of oil. We do not plan to use oil at Clifty Creek Station for normal day to day generation.

Q Has your company ever considered constructing a nuclear power plant?

A We have studied the possibilities of constructing a nuclear station, yes. This was a very brief study made to determine what the costs might be should the Atomic

Energy Commission at some future date need capacity greater than that we are able to supply from our two generating stations. However, this has been three or four years ago and there have been no recent studies.

Q What conclusions did you come to, if any, as to the cost comparison between coal and a nuclear plant?

MR. HEDLUND: Are you speaking now of operating costs or construction costs?

MR. SIMS: Total costs.

BY THE WITNESS:

A The total cost at the time was quite interesting, really, but there was one factor, which you don't know whether you are using the right components or not, and that is what is your equipment going to cost. It [52] is very difficult to get firm prices.

• • • •

[55] Q Basically, the delivered coal price is broken down into the price of the coal at the mine and the transportation cost, is that not right?

A We are interested in pricing our coal as delivered in cents per million BTU. Does this answer your question?

Q Of course, you are interested in the total delivered price, but this total delivered price is generally broken down into a price f.o.b. mine—

A Yes.

Q —and the transportation cost?

A Yes.

Q The cost a particular coal company would incur producing coal at its mine would have nothing whatsoever to do with the transportation cost, would it?

A It should not.

Q So, just by knowing the barge rates, the transportation rates, you could not tell whether a coal company could supply you coal competitively unless you knew what they were—

A Selling coal for.

• • • •

[59] BY MR. HEDLUND:

Q Which, I gather, Indiana-Kentucky does not?

A Yes. We don't have hundreds of thousands of customers. We have 16 customers.

Q You stated that people were hoping for a development of the fast breeder nuclear reactor. Can you tell me why this is being hoped for?

A The theory under the fast breeder is that it producers more than it consumes. Obviously, this would produce low cost fuel.

Q Low cost fuel or low cost electricity?

A Low cost electricity, because the fusion of your atomic matter would produce more than consume.

Q In light of your present contracts and the long-term contracts that you have recently entered into, have you now contracted for all of your long-term contract coal for your facility at Clifty Creek through its expected life?

A We've contracted for what I mentioned previously, what we consider our second phase, which is through the early 1980's. As to what our expected life would be beyond 1980, it would be [60] entirely dependent on the conditions of the generating capacity of the United States at that time.

MR. HEDLUND: I have no further questions.

RECROSS EXAMINATION

BY MR. SIMS:

Q Mr. Ward, do you have any knowledge as to when the breeder reactor will be developed?

A I have none whatsoever.

MR. SIMS: We have no further questions.

MR. HEDLUND: Mr. Ward, you have the right to ask for an opportunity to read the transcript of your deposition before signing it, or you can waive your signature. Reading it would give you an opportunity to make such corrections as are necessary in terms of the

accuracy of the transcription. Which would you prefer to do?

THE WITNESS: What is normally done in this respect?

MR. HEDLUND: Well, there is no normal practice. In most of the depositions we have taken so far, the witnesses have asked for an opportunity to read the transcript.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF REUBEN A. REDARD, TAKEN JUNE 10, 1969

* * * *

MR. HEDLUND: Mr. Redard, during the course of my questioning if I ask you a question that you do not understand or if Mr. Futterman asks you a question that you do not understand, please do not hesitate to ask us for clarification. Sometimes I think I know what I am talking about but it is not clear to the witness.

Also, should I interrupt you before you have completed your answer, please tell me that I have done that and then give your full answer. I will not do this intentionally, but sometimes in the process of looking toward the next question I may do that.

RUBEN A. REDARD,

called as a witness by the defendants herein, having been first duly sworn by the Notary Public, was examined upon oral interrogatories, and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name and your present occupation.

[4] A Ruben A. Redard, Vice President in charge of purchases for Keystone Steel and Wire, Division of Keystone Consolidated Industries.

Q Are you a resident of Peoria?

A Yes.

Q How long have you lived here?

A Thirty-two years.

Q Would you please, sir, briefly describe your educational and business background.

A I was educated at the University of Illinois and majored in business administration. My first employment was with the War Department as a surveyor on the Illinois River, after which I went to work for Keystone, and my service with Keystone was only interrupted for three years during World War II, at which time I served in the Army, and I have been here ever since.

Q What positions have you held with Keystone, again briefly, if you will, please.

A I was in the Sales Department as Assistant Sales Director, later a sales analyst, later Assistant Manager of the Priorities Department, and then after the war I was a buyer and Assistant Purchasing Agent, Purchasing Agent and now Vice President.

[5] Q Would you briefly describe the functions you performed in your position as Vice President in charge of Purchasing?

A Yes. I'm responsible for all buying at Peoria and also Chicago Heights.

Q Would you please give me your degree of involvement while you have been in purchasing for Keystone with coal purchasing for your facility in Peoria.

A I was indirectly involved in coal purchasing up to 1962. My immediate superior became deceased at that time, and coal was one of the commodities for which I assumed full responsibility from '62 on to the time we sold our power plant approximately a year ago.

Q Will you please briefly describe the business of Keystone Steel and Wire.

A We're a primary steel producer and we fabricate numerous steel products for a number of industries.

Q Until your power plant in Peoria was sold, for what purposes did you buy coal for that plant?

A Will you restate that?

Q Prior to your selling the power plant at your facility in Peoria, why did you buy coal?

A To service our power plant only.

Q Were you generating your own electricity?

[6] A Yes.

Q With coal?

A Yes.

Q Were you producing steam?

A Yes, as a by-product.

Q Was there any other use of the heat generated by the coal?

A We used steam for heating purposes in the plant. The primary purpose of the plant, of course, was to generate electritity.

Q In the year 1967 do you recall approximately the total amount of coal that was purchased by Keystone for its Peoria facility?

A Approximately 175,000 net tons.

Q How did this compare with, say, the preceding five-year period?

A There was some variation, but I would say from 150,000 to 175,000 would describe our usage, annual usage.

Q In 1967 do you know how Keystone ranked in the general Peoria area among non-utility buyers of coal in terms of the total coal purchased?

A Number 1.

Q As I understand it, your power plant has been [7] sold, is that correct?

A Yes, that's correct.

Q So, you are no longer purchasing coal for that plant or for any of your facilities or for your facility generally here in Peoria, is that correct?

A That's correct.

Q To whom did you sell the power plant?

A Central Illinois Light Company.

Q When did they take over operation of the plant?

A April 1, 1968.

Q Would you please give us the reasons why your power plant was sold to C.I.L.C.O.?

A We had an offer we couldn't turn down.

Q Could you go into that in a little bit more detail in terms of your reasons why you were interested in selling the plant?

A Yes.

MR. FUTTERMAN: Excuse me just a minute. I do not think that you have correctly characterized, and I do not think there has been any testimony as to other reasons why the plant has been sold. I think if you want to get that, you should ask that. On that basis I will object to that question.

[8] MR. HEDLUND: I have asked the witness to expand on his answer if he chooses to do so. I did not intend to characterize his testimony one way or the other.

BY THE WITNESS:

A About the time we had the offer from C.I.L.C.O., or perhaps I should say a short time preceding the offer, we had made a decision to build two electric furnaces to replace our five open hearths. We knew that our electrical energy requirements would be doubled upon completion of the two electric furnaces, and we would have to buy this power from a local utility. They consequently offered us a very attractive rate, described in Rate 33.

As a part of their offer they suggested we might be privileged to use Rate 33 for the balance of our power requirements throughout the plant. We were also aware of the requirements made by the State of Illinois that we eliminate air pollution. We were faced with an expenditure of approximately one million dollars.

We also were aware of the fact that some of these machines in this plant were built in 1918. We had no reserve capacity. This was part of the offer, [9] that we would be provided with adequate backup at all times. These add up to the acceptance of the offer.

BY MR. HEDLUND:

Q Since C.I.L.C.O. took over operation of your plant, how has the situation worked out, that is, your purchasing all of your power from C.I.L.C.O.?

A Very satisfactorily.

Q You mentioned the availability from C.I.L.C.O. of backup power. Why was that important?

A We were using the capacity limit of power generation from our plant. We had no provisions for backup should an accident occur or a machine be shut down, either by an act of God or through failure of equipment. The C.I.L.C.O. proposition did provide for backup power from other plants. We would have had to have spent a considerable sum of money for new equipment in order to do the same—to obtain the same results on our own.

Q Is the equipment at the power plant designed to burn coal from a particular area or having particular chemical properties?

MR. FUTTERMAN: I object to that question as leading.

[10] MR. HEDLUND: Mr. Futterman, would you care to enlighten me, with your experience, as to how to ask that question without being leading?

MR. FUTTERMAN: I think you have had enough experience to know how to ask a question.

MR. HEDLUND: I think your objection is patently ridiculous.

MR. FUTTERMAN: The Judge will decide that.

BY MR. HEDLUND:

Q Would you answer the question, Mr. Redard, if you understand it?

MR. SCHNEIDER: Go ahead and answer.

BY THE WITNESS:

A Our equipment was designed specifically to handle No. 5 and No. 6 seam coal from this area, principally Fulton County.

BY MR. HEDLUND:

Q Prior to the construction of these boilers, were samples taken of the Fulton County coal?

A Yes.

Q Were those turned over, or at least the results of that sampling, turned over to the boiler manufacturers?

A Yes.

[11] Q To your knowledge has the power plant burned coal from mines located in areas other than the immediate vicinity of Peoria?

A No.

Q Did any coal producer in the past propose to you that you purchase coal from a different seam in a different area?

A Yes.

Q Who was that?

A Republic Coal.

Q What was their proposal?

A After their reserves ran out in the Peoria area, approximately two years before we sold the plant, they suggested providing No. 3 seam coal from the Virginia, Illinois mine. However, we did not see fit to do it.

Q Why was that?

A Our equipment was designed for No. 5 and No. 6, and we would have had to spend a considerable amount of money to provide equipment to handle No. 3. We didn't see any reason to do this as long as other coal companies could provide the coal our equipment was designed for.

Q In general, Mr. Redard, why have you never [12] purchased coal from mines located outside or beyond the general vicinity of Peoria?

A It would have cost more. We purchased the most economical coal we could obtain. Hence, the material adjacent to Peoria was less expensive.

MR. HEDLUND: I would like the reporter to mark as Redard Deposition Exhibit 1 a letter of April 26, 1968, from Mr. R. A. Redard, Vice President, Purchasing, to the Department of Justice. Having done so, would you please hand it to the witness.

(The document was thereupon marked Redard Deposition Exhibit 1 for identification, 6-10-69.)

MR. HEDLUND: Will the Government agree to the application of the standing stipulation to this letter?

MR. FUTTERMAN: I would like to ask Mr. Redard a few questions about this letter before I do so. I believe it will apply, but I will wait until my cross examination. If you would ask me that question at the termination of my cross examination, I think we can have it apply.

[13] BY MR. HEDLUND:

Q Mr. Redard, is this a copy of a letter that you wrote to the Department of Justice on April 26, 1968?

A Yes.

Q To your best knowledge and belief, are the facts set forth therein true and accurate?

A Yes.

Q Do you know whether the Freeman Coal Mining Corporation in its own name or under its own name operates any mines within the general vicinity of Peoria?

A I don't know of any.

Q You do not know of any?

A No.

Q In your opinion, has the common ownership of The United Electric Coal Companies and Freeman Coal Mining Corporation had any adverse effect in the past on the coal purchasing of Keystone Steel and Wire?

A No.

Q Is it fair to state that now that you are out of the coal purchasing business that this common ownership would have no effect upon Keystone in the future?

[14] A Yes.

Q As a resident of Peoria, Mr. Redard, according to your knowledge, what remains of the residential heating market for coal in this area?

A Very little, if any.

MR. HEDLUND: You may inquire.

MR. FUTTERMAN: Thank you, Counsel.

Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. FUTTERMAN: Back on the record.

CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mr. Redard, isn't it a fact that some of your coal burning equipment in the power plant was very old and that the useful life of some of that equipment was practically zero?

A I wouldn't say it was practically zero. It was quite old, however, some of it.

• • • •

[16] Q Would you answer the question, please?

[17] A I have been told that was correct.

Q Mr. Redard, during the period that Keystone was purchasing coal, was coal cheaper than gas for the purpose for which coal was consumed?

A Yes.

Q During this same period, was coal cheaper than oil for the purpose for which coal was consumed?

A Yes.

Q Was this true throughout the entire period?

MR. HEDLUND: Which period are you talking about, Counsel?

MR. FUTTERMAN: The period during which Keystone purchased coal for its electrical generating equipment.

BY THE WITNESS:

A It was true except for a short period during the summer months at which time C.I.L.C.O. offered dump gas. This, I believe, was for a two-year period.

Q Is it not a fact that C.I.L.C.O. decreased its sales of dump gas after it developed underground storage caverns?

A Yes.

Q Is it not also true that the dump gas was sold at the low rate at which it was sold because of [18] the fact that C.I.L.C.O. could not sell this to the higher rate customers?

MR. HEDLUND: I object to that question. I believe this is more properly directed toward C.I.L.C.O.

BY MR. FUTTERMAN:

Q Would you answer the question, please.

A I am of the opinion that this is correct.

Q Mr. Redard, when Keystone installed its coal burning equipment, is it not a fact that it could have installed a boiler designed to burn other than Fulton County coal?

A Yes.

Q Isn't it a fact that a boiler may be designed to take coals of varying size and quality?

A To my knowledge, yes.

Q When Keystone installed its boilers, was there any reason to expect that Fulton County mines could not supply all of Keystone's coal requirements?

A No.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF HARRY B. GAUNT, TAKEN JUNE 13, 1969

* * * *

HARRY B. GAUNT,

called as a witness by the defendants herein, having been first duly sworn by the Notary Public, was examined upon oral interrogatories, and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. IRVING:

Q Will you please state your full name, sir?

A My full name is Harry B. Gaunt.

Q Mr. Gaunt, what is your current home address?

A My current home address is 1894 Alexander Drive, Lexington, Kentucky.

Q What is your current employment and position, Mr. Gaunt?

A My current employment is with the Kentucky Utilities Company and I am Purchasing Director for the same company.

Q Are you appearing for this deposition this morning pursuant to a subpoena?

A Yes, sir, I am.

Q Mr. Gaunt, would you please briefly describe [4] your professional background and experience.

A Well, my professional background starts off with an engineering degree from the University of Kentucky. I've been with the Kentucky Utilities Company approximately 25 years in various engineering capacities and purchasing, the last ten years being in purchasing functions. I had in between those times some five to six years experience in the coal industry.

Q What was the nature of your experience in the coal industry, sir?

A I was in charge of a mining operation in Harlan County.

Q Mr. Gaunt, do you consider yourself knowledgeable

in the area of fuel procurement, and particularly in the procurement of coal?

A Yes, sir, I believe so.

Q Would you please describe for us the general market area served by Kentucky Utilities for the generation of power.

A Can I talk off the record for a minute?

MR. IRVING: Can we go off the record for a second?

MR. SIMS: Go ahead.

MR. IRVING: Off the record.

[5] (There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. IRVING: Back on the record.

BY THE WITNESS:

A Our general service area covers Kentucky, generally speaking, with parts of Virginia and Tennessee. We serve 78 counties in the State of Kentucky, five counties in the State of Virginia, and one county in the State of Tennessee, for a total of 84 counties in the three combined areas.

BY MR. IRVING:

Q How many power generation stations does KU operate?

A We have four power generation stations, steam, and one hydroelectric station.

Q Where are KU's facilities located?

A Well, the Kentucky Utilities facilities are located, one plant is in southeastern Kentucky, being the Pineville Plant located near Fourmile, Kentucky. We have one plant near Burgin, Kentucky, or Harrodsburg in the central part of the state. We call that our E. W. Brown Generating Station. Connected with that is our hydro station adjacent to it. Also in [6] central Kentucky we have a plant near Lawrenceburg, Kentucky on the Kentucky River. We call that our Tyrone Generating Station.

In the western part of the state near Central City, Kentucky, we have our western facility called the Green River Generating Station.

Q Mr. Gaunt, do any of the four steam stations of Kentucky Utilities purchase coal from mines located in Illinois, Indiana or west Kentucky?

A No, sir, we do not. Oh, west Kentucky, we do purchase from west Kentucky, but we do not purchase any coal from Indiana or Illinois. We do not purchase any coal outside of the State of Kentucky.

Q Which facility or facilities purchase coal mined in west Kentucky?

A Our Green River Generating Station.

Q Is this the only facility operated by Kentucky Utilities which purchases coal from mines in Illinois, Indiana or west Kentucky?

A Generally speaking, yes. However, there has been an instance in years gone by where we might have moved something less than one percent into central Kentucky to E. W. Brown Generating Station.

Q Where would that coal be moved from?

[7] A It would be moved from the same coal customers we have in west Kentucky through Louisville and down to our Green River Generating Station—I mean down to our E. W. Brown Generating Station. Excuse me.

Q Sir, why is it that the Green River Station, which does purchase coal from the west Kentucky mines located in the so-called Eastern Interior Coal Province, buys no coal from Illinois or Indiana mines?

A Well, we are what you might say sitting on top of the coal field within a 15 to 25 mile radius. We feel like the freight rates are more competitive at that close a distance, and what little experience in contact work that I have seen as far as tariffs are concerned, when you move coal interstate versus intrastate, they are usually higher, in my experience.

MR. IRVING: Will you please read the last answer.

A (Read by the reporter.)

BY MR. IRVING:

Q Mr. Gaunt, would it be a fair summary of the answer you just gave to say that—

MR. SIMS: Counsel, I am going to object to that. Mr. Gaunt has testified in his own words, and I do not

think it serves any purpose for you [8] to characterize his statement.

BY MR. IRVING:

Q Mr. Gaunt, in your experience have you found that the transportation element in the cost of purchasing coal is an important element?

A Yes, sir, it is an important element in the delivered cost of coal to a facility.

Q From what mines and what companies does the Green River Plant buy coal?

A We buy coal from three companies generally under contract. We buy coal from Pittsburgh-Midway Mining Company, we buy coal from Island Creek Coal Company, we buy coal from Peabody Coal Corporation. One mine of Peabody, generally three of Island Creek Coal Company, and one mine of Pittsburgh-Midway Coal Company.

Q Could you name the mines, sir, of the respective companies?

A The Paradise Mine is the name of the mine of Pittsburgh-Midway. Fies and Briar Creek and East Diamond are Island Creek. I might say that Briar Creek and Crescent are interchangeable, one and the same. I think they have changed names. We buy coal from the Vogue Mine of Peabody Coal Corporation.

[9] Q Mr. Gaunt, about how many miles from the Green River plant are the five mines that you mentioned?

A I would say they were in a radius of 25 miles approximately.

Q None of them are farther than 25 miles from Green River, approximately?

A To my knowledge, they are not.

Q Do these mines serve Green River under contracts of longer than one year in duration?

A Yes, sir, they do.

Q How long are the current contracts under which you purchase coal?

A Our current contracts at present are with Pittsburgh-Midway, we have a ten-year contract; with Is-

land Creek Coal Company we have a five-year contract, and with Peabody Coal Corporation we have a five-year contract.

Q Would you tell us when these three contracts are up for renewal, in other words, when the current terms expire?

A All three contracts will be up for renewal in 1971.

Q Is it your expectation that when these contracts are renegotiated they will be of a similar [10] long-term nature?

MR. SIMS: I am going to have to object. This is speculative.

BY MR. IRVING:

Q Go ahead, sir. You may answer the question.

A I would say that's a management prerogative, but I believe that we would have to have some long-term contracts.

Q Based on your experience with KU, sir, does the company have a practice, as a large utility, of entering into long-term contracts?

A It depends on what the definition of a long-term contract is, but we have had several ten-year contracts, and I would consider that a fairly long contract.

MR. IRVING: I would, also.

BY MR. IRVING:

Q Do you ever buy coal for Green River on the spot market, that is, other than under these three contracts?

A It is an exception other than the rule. It's strictly an emergency situation.

Q When you do buy coal on open account for Green River, where are the mines which supply this coal [11] located?

A They are within the same 25 mile radius of the Green River Plant, in that general area.

Q Do all the shipments of coal under the three contracts you mentioned earlier travel to the mine—strike that, please.

How does the coal under the three contracts you mentioned earlier travel from the mines to Green River?

A Well, the coal from the Paradise Mine of Pittsburgh-Midway travels by Green River barge. The coal from the other two companies, Island Creek Coal Company and Peabody Coal Corporation is carried by rail carrier.

Q Would you please name the railroad or railroads involved in that transport?

A The question, please?

MR. IRVING: Would you please read the question.

Q (Read by the reporter.)

BY THE WITNESS:

A L & N Railroad.

BY MR. IRVING:

Q Is that the Louisville & Nashville?

[12] A Louisville & Nashville Railroad, yes, sir.

Q What is the rail freight rate from the west Kentucky mines to the Green River Station, sir?

MR. SIMS: Which mines, Counsel?

MR. IRVING: I would like an answer, if possible, taking into account all the mines involved.

BY THE WITNESS:

A We have a rail rate on the L & N Railroad Company from Fies and Briar Creek of 74 cents. Their East Diamond Mine carries the 89-cent rate. Peabody Coal Corporation's mine at Vogue carries the 89-cent rate.

BY MR. IRVING:

Q For the purpose of the record, sir, when you say "89 cents" do you mean per ton?

A Eighty-nine cents per ton.

Q How does the barge cost on the Green River compare to that rail rate?

A Well, the barging cost is somewhat lower than the rail rates.

Q Sir, by "somewhat" do you mean approximately half or approximately a third, or what?

A Let's say approximately one third.

[13] Q Mr. Gaunt, approximately how many tons of coal does KU purchase annually for the generation of electricity, and this question concerns all of the coal-burning facilities.

A To be specific, in 1969 we purchased approximately 1,156,802 tons.

MR. STEWART: '68.

BY THE WITNESS:

A (Continuing) '68. Excuse me.

BY MR. IRVING:

Q What you just gave us was for 1968, sir?

A Yes, sir. That was '68 figures. It normally runs somewhere between a million to a million two approximately.

Q By "million two", you mean 1,200,000?

A A million, two hundred thousand.

MR. IRVING: I say this for the sake of the record, for people who will read this later and who are not present today.

BY MR. IRVING:

Q About how many of these tons are purchased annually for the Green River station?

A Well, for the record, in 1965 we purchased 440,000; in 1966 we purchased 476,000; in '67 we [14] purchased 543,000; in '68 we purchased 499,000. I would say roughly I always think about a half million tons of coal per year for the Green River Plant, plus or minus.

Q Is this your largest facility in terms of purchase of coal for the generation of power?

A No, sir, it is not.

Q What station would be, sir?

A Our E. W. Brown Generating Station is—well, I will retract that statement. There is very little difference between E. W. Brown and Green River as far as tonnage is concerned. One year one will surpass the other, and one year—they vary back and forth, but they are roughly in the 475,000 to 500,000 class, tons, each plant.

Q Where are the mines located which supply coal to your central and eastern Kentucky plants, and I am speaking now of Brown, Tyrone and Pineville.

A They are located in what I classify as the Eastern Kentucky Coal Fields.

Q Sir, about how far are these mines from the respective plants which they serve?

A Would you like to have specific distances?

Q I think a general approximation would be fine.

[15] A I would rather not guess. I don't want to trust my memory.

Q Fine.

A Do you want me to give distances to the Brown plant and to the—from Green River?

Q No, sir. These are the distances—

A Eastern Kentucky mines?

Q —between the mines that service the Brown, Tyrone and Pineville, to those respective plants.

A Well, there is possibilities of—to our Brown Plant from what I call the Eastern Kentucky Coal Field, approximately 220 miles and another distance of 180 miles, so roughly 200 miles from one eastern Kentucky field.

Another field in eastern Kentucky Coal Field is approximately 170 miles.

Q This is still the Brown Plant?

A To the Brown Plant.

Another area is approximately 123 miles. Another area is approximately 100 miles.

Q Would those figures be approximately the same for the Tyrone Plant?

A I would add 20 miles to each of those figures for the Tyrone Generating Station.

[16] Q How about the distance between the east Kentucky mines and the Pineville Plant which they service?

A The rail mines do not serve our Pineville Plant. It is served by truck, but the mines are within, rail mines are within a radius of 30 miles of the Pineville Generating Station.

MR. IRVING: Could I please have the answer? I was a little confused between rail lines and rail mines.

A (Read by the reporter.)

BY MR. IRVING:

Q Sir, how far are the truck mines, or the mines that do truck coal, from the Pineville Plant?

A The truck coal for the Pineville Plant is within a radius of ten miles.

Q Mr. Gaunt, how far are the west Kentucky mines which serve the Green River Station from the Tyrone and Brown Plants?

MR. SIMS: Could I have that question read back, please.

Q (Read by the reporter.)

BY THE WITNESS:

A Approximately 260 rail miles.

[17] (There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY MR. IRVING:

Q It would appear, then, sir, that the east Kentucky mines are somewhere between 60 to 100 miles closer than the west Kentucky mines are to your central facilities.

MR. SIMS: I object to this, Counsel. You can ask specific questions and not lead the witness.

MR. IRVING: I will rephrase the question if it would make counsel for plaintiff happier.

MR. SIMS: We are not concerned with what it appears to you. Simply ask Mr. Gaunt the question.

BY MR. IRVING:

Q Is it a fact, Mr. Gaunt, that the east Kentucky mines are approximately 60 to 100 miles closer to your central Kentucky facilities than the West Kentucky mines are to those facilities?

A That is right, sir.

Q Does this mileage difference result in a significant difference in the freight rates between [18] the two districts?

A Yes, sir.

MR. SIMS: Excuse me. Has there been any testimony as to freight districts?

BY MR. IRVING:

Q The freight rates from the west Kentucky mines compared to the freight rates from the east Kentucky mines.

A (Addressing the reporter) Question.

Q (Read by the reporter.)

MR. SIMS: To what point?

MR. IRVING: I will restate the question.

BY MR. IRVING:

Q My question, Mr. Gaunt, is does this 50 to 100 mile difference result in a significant difference in the freight or transportation cost from the east Kentucky mines to your central facilities compared with the cost from the west Kentucky mines to your central facilities?

A Yes, sir.

Q Could you give an approximation of what the difference would be in the two rates?

A The last rate that was published from west Kentucky to central Kentucky, which I'm referring to [19] as the E. W. Brown Generating Station, was $2.75, but since that time what we refer to as ex parte 256 and 259 increases that the railroads have requested in the State of Kentucky and possibly over the United States resulted in an additional five percent approximately—or an additional ten percent, we'll say, on top of that $2.75.

The rates that I gave you previously are as is. They were negotiated during the same procedures, and the rates now from eastern Kentucky to Brown Station are $2.07 and $2.11 respectively on the L & N Railroad Company, and $1.35 on the Southern Railroad, to E. W. Brown.

Q What type of combustion unit do you have at the Green River Station, Mr. Gaunt?

A We have a Babcock-Wilcox boiler.

Q Was this equipment designed to accommodate the local west Kentucky coal which is burned at Green River?

A According to the specifications that I've seen, our engineering personnel gave Sargent & Lundy, our consulting engineers, who in turn gave it to Babcock and Wilcox, general characteristics of western Kentucky coal, in particular, Muhlenberg [20] and Ohio counties, adjacent to the plant.

Q Would the combustion of coal which did not have the characteristics of the local coal cause any problems with the boiler?

MR. SIMS: What coals are you speaking of, Counsel? Any coal?

MR. IRVING: Any coal which did not have the characteristics of the local coal which is burned there, yes, sir.

BY THE WITNESS:

A If your fusion changes on the coal, then you get slag. First of all, I want to say I'm not a combustion engineer, but it does cause us mechanical problems when we get tolerances too wide on the specifications that we give. If the fusion goes down, and we have not given them a fusion that they are supposed to design for of 1900 and it gets down to 1700 or 1800, which I don't think that it would do it, but then we would have some problems on slagging. That naturally gives you mechanical problems and you'd have to back off on your kilowatt hour generation.

Q What other characteristics are the most important to meet in order to avoid inefficiencies or this breakdown in the generation capacity?

[21] MR. SIMS: Object. This is leading.

BY MR. IRVING:

Q You may answer the question, sir.

A There are several ingredients of coal that the design people should know about. They have to know about the sulfur content, they have to know about the fusion, they have to know about the Hard groove groundability index, they have to know about the moisture in the coal, they have to know the general heat rate of the coal, and usually a breakdown of those very—an elemental breakdown of any of the constituents that you can break down.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY MR. IRVING:

Q Mr. Gaunt, are there any significant differences among the types of coal from different reserve fields?

A To my knowledge there are differences, yes, sir.

Q Will coal vary from seam to seam in its quality and characteristics?

A Under general circumstances, when a seam of [22] coal is placed in the earth and it covers an area of 15 or 20 or 25 miles around, it is identified as a certain seam, the characteristics change, in my experience, very little. It all depends on what the coal operator is doing with his mechanical equipment. They don't have eyes on them, and once in a while they pick up dirt and throw it into the coal or something.

Q Sir, I was referring not within one seam, but coal from one seam compared to coal from another seam.

A Are they different?

Q Yes, sir.

A Yes, sir, they are different.

Q In what characteristics would they differ or often do they differ?

A Well, they will differ in ash content, they will differ in BTU content, they will differ in moisture content, they will differ in ash content, they'll differ in fusion and practically all the analysis.

Q Mr. Gaunt, to your knowledge has Kentucky Utilities ever investigated the possibility of converting to nuclear energy, natural gas or oil as [23] a source of power?

A I would say I'm not in a position to give you a specific answer on that, sir.

Q Mr. Gaunt, I am only asking whether to your knowledge there has been any investigation of such a possibility.

A I feel sure that there has been, but—I think that is the best statement I can make on it, sir.

Q Mr. Gaunt, do you know of any plans for the installation in the near future, and by that I mean in the next five years, say, of a plant which will use nuclear energy, natural gas or oil?

A Not in the Kentucky Utilities Company, sir.

Maybe I better retract that statement. I will have to say that we are, the management of the company, is planning installation of a peak gas dual—gas or oil peaking turbine, which we will use to knock off the peaks

where our system is getting pretty close to its top capability, possibly located here in Central Kentucky. I think the capacity of it is three 17 megawatt units, making a total of approximately 51 megawatt capacity.

Q Do the plans call for this plant to be [24] constructed in the next five years, say?

A It is my knowledge that the management of the company is expecting the gas turbine or gas or oil to be in operation by late 1970.

Q Sir, you also mentioned dual capacity. Would you explain that?

A What I mean by dual is that it can be fired with either oil or gas.

Q Mr. Gaunt, what is the capacity of your hydroelectric plant at Dix Dam?

A At Dix Dam we have three 7500-kilowatt turbines, so that would be roughly around 22,500 kilowatts capacity. Then, the other little hydro station down the river from that is, I believe, a 2,000-kilowatt.

Q Mr. Gaunt, as the purchasing agent for a large utility and as a former operating manager of a coal company, would the experience gained by a producer in strip mining qualify that producer, apart from all other considerations, to go into deep mining?

MR. SIMS: Objection. You did not lay the proper foundation, Counsel, for asking this opinion.

[25] BY MR. IRVING:

Q You may answer the question, Mr. Gaunt.

A (Addressing the reporter) Question.

Q (Read by the reporter.)

BY THE WITNESS:

A Not necessarily.

BY MR. IRVING:

Q Is there a difference in the technology used in strip mining from that used in deep mining, sir?

A Yes, sir, there is a different technology, quite different.

Q Could you specifically name some of the problems that would confront a newcomer to the deep mining of coal?

A Well, an operator who mines underground, he's got to be familiar with ventilation problems, he's got to be familiar with roof bolting problems, he's got to be familiar with operating loading equipment, which is entirely different from strip mining equipment, he's got a whole lot more procedures on draining his mine as far as drainage is concerned.

I guess that's predominantly all that comes to my mind right now.

Q Mr. Gaunt, would you be hesitant to enter [26] into a long term contract with a heretofore exclusively strip mining company who was just beginning to mine deep reserves?

A I would be hesitant.

Q Mr. Gaunt, to your knowledge what is the reserve picture in the west Kentucky region?

A So I won't get in trouble with the Federal Department of Mines and Minerals, I will give you figures of 1966. Estimated remaining bituminous coal reserves in the State of Kentucky in the western Kentucky district, they say approximately 37 billion tons of coal. In eastern Kentucky they say approximately 30 billion tons of coal. There has been some mined, quite a bit mined, in the last three years, so those figures, I would presume, would be reduced.

Q In terms of the economics and feasibility of mining those reserves, do you believe those figures to be accurate in your opinion, sir?

A I'm not going to question the Federal Department of Mines and Minerals, but it is my understanding that in making these reserve calculations that they consider any seam of coal regardless of the thickness, maybe 12 inches up to 6, 10, 12 foot, whatever they happen to be, that they have core [27] drilled and prospected for.

Q In terms of the feasibility of mining coal, would the thickness of the seam be an important element in your decision whether or not to mine that coal?

A Yes, sir, it would be. I don't want to be crawling around in 12-inch coals around the mines.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

BY MR. IRVING:

Q Is it a fact, Mr. Gaunt, that the figures you quoted from the Bureau of Mines do not take into account the economic feasibility of mining the reserves?

MR. SIMS: I object to that as leading.

BY MR. IRVING:

Q You may answer the question, sir.

A It's strictly reserves, coal reserves. If they took economics of mining into consideration, I'm not familiar with it.

Q Mr. Gaunt, has the fact that both United Electric Coal Company and Freeman Coal Company have been controlled by General Dynamics had any adverse effect on Kentucky Utilities as a consumer of coal?

[28] A If it has, I don't know anything about it because I don't know Freeman or anything about Freeman or—is it United Electric?

Q Yes, sir.

A (Continuing) I know very little—I've heard of General Dynamics, but outside of that, that's about it.

Q Will there be any adverse effect on KU if General Dynamics is allowed to continue owning both Freeman and United Electric?

MR. SIMS: Now or in the future?

MR. IRVING: I am sorry, Counsel. I did not hear you.

MR. SIMS: Now or in the future?

MR. IRVING: Will you read my question, please.

Q (Read by the reporter.)

MR. IRVING: I think the question is clear.

BY THE WITNESS:

A I don't see how there could be.

BY MR. IRVING:

Q Would there be any benefit to KU by forcing Freeman and United Electric to operate independently of each other, sir?

[29] A I don't see how there could be in that either.

Q Mr. Gaunt, has concentration in the coal industry had any adverse effect upon KU as a consumer of coal?

MR. SIMS: Are you stating, Counsel, that concentration in the coal industry is a fact?

THE WITNESS: May I ask a question?

MR. IRVING: Can we go off the record for a second?

MR. SIMS: All right.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. IRVING: Back on the record.

BY THE WITNESS:

A What do you mean by "concentration"?

MR. IRVING: Strike my last question, please, for the time being.

Miss Reporter, will you please re-read Mr. Sims' last comment?

(The record was thereupon read by the reporter as above recorded.)

MR. IRVING: For purposes of the record, I am not so stating, in answer to Mr. Sims' last [30] comment.

BY MR. IRVING:

Q Mr. Gaunt, are you aware of any past mergers in the coal industry that have had an adverse effect upon Kentucky Utilities as a consumer of coal?

A No, sir, I'm not.

MR. IRVING: Counsel for defendant has no further questions at this time.

(There was a short interruption, after which the taking of the deposition was resumed, as follows:)

CROSS EXAMINATION

BY MR. SIMS:

Q Mr. Gaunt, have there been times in the past when you have gone on the spot market and bought some coal because one of your coal contractors had not delivered the required tonnage?

A Yes, sir, that is true.

Q Has the spot coal market provided an alternative source of supply in such instances?

A It has been an alternative source of supply.

Q When did your Green River Plant go into operation?

* * * *

[41] BY MR. SIMS:

Q In fact, Mr. Gaunt, you have never used gas or oil in any of your coal-consuming generating stations, is this not a fact?

A That is right, sir, other than what I mentioned previously in my testimony, that we use fuel oil to get the fire started in our fossil fuel plant.

Q Mr. Gaunt, you testified in connection with your background that you, I think, had been engaged in some mining operations.

A Yes, sir.

Q When was this?

A 1949 through roughly '55.

Q What did you do in the mining operations at this time?

A Well, I was in charge of operations of the mine, taught classes on mechanical underground equipment, watched preparation at the plants, just general supervision of an underground coal mine.

Q Have you ever had any experience operating a strip mine?

A No, sir, I have had no experience in strip mining.

* * * *

[49] MR. SIMS: I have no further questions at this time.

MR. IRVING: I would like a further brief recess after your last question.

(A short recess was thereupon taken, after which the taking of the deposition was resumed, as follows:)

MR. IRVING: Back on the record. I have only a few more questions, Mr. Gaunt.

REDIRECT EXAMINATION

BY MR. IRVING:

Q With regard to the spot market, when was the last time Kentucky Utilities purchased coal on the spot market for the Green River Station?

A I'd say we purchased, I believe, maybe one time last year. I'd have to check records to see if this is a fact, but I think one time of about a week period last year and just in the last 30 to 60 days.

Q Approximately what percentage of the coal requirements at Green River were then supplied by the spot market?

MR. SIMS: Of which year? Last year?

MR. IRVING: The entire year's total for [50] last year, since this year is not as yet completed.

MR. SIMS: If you know.

BY THE WITNESS:

A It's less than one percent.

BY MR. IRVING:

Q Who supplied that spot coal?

A I believe it was O'Keefe Brothers Coal Company.

Q Do you know what mine it came from?

A It's a mine near Moorman, Kentucky. I do not know right now the name of the mine.

Q Generally, is the amount you are purchasing on the spot market increasing or decreasing, taking the company as a whole, over the last ten years, say?

A It will definitely decrease.

Q Since there was some confusion on cross examination, Mr. Gaunt, would you please describe the function of a peaking station?

A Well, the function of a peaking station is when all your steam generating stations are loaded as much as they'll load without running them into overpressures and getting yourself into a critical condition on your steam temperatures and your boiler pressures, you take a little of the peak off with it, [51] and then that relieves the load on your steam generating units.

Q Mr. Gaunt, does this mean that it is virtually impossible to predict the output and operational cost of a peaking station?

A I would say so, because you don't know how much you are going to have to run it or when.

Q Sir, is the transportation element an important part of the delivered price of coal?

A Yes, sir, it is.

Q Will this transportation element vary widely depending upon where the supplying mine and the receiving facility are located?

A Yes, sir, it varies quite a bit.

Q Mr. Gaunt, in order for a blend of coal to be efficiently burned in a boiler, is that blend blended according to specifications or a proportion?

A It's blended to a percentage.

Q Is this percentage or formula geared to the limitations of the boiler which you mentioned on direct examination?

A Yes, sir, it is, because if you happen to have a seam of coal here (indicating) that don't come up to the characteristics—it's got to be a certain [52] blend put with this (indicating) and this (indicating) to meet the overall specs that Sargent & Lundy and Combustion Engineering was given for the boiler design in the original design.

MR. IRVING: Counsel for defendant has no further questions at this time.

MR. SIMS: I have no further questions.

MR. IRVING: Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. IRVING: On the record.

Mr. Gaunt, would you like to waive signature? What this means is, do you want to read your deposition, as many people do, and then sign it so that you may correct any errors or mistakes that are made, or will you waive your signature?

MR. MARSHALL: Mr. Irving, if you brought down an ugly old reporter, we might trust her, but I do not see how a girl can be this pretty and still take this down. I believe we would like to have a look at it.

* * * *

[4]

EXCERPTS FROM DEPOSITION OF GORDON J. MORRISON, TAKEN JUNE 20, 1969

• • • •

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Mr. Morrison, are you testifying here pursuant to a subpoena?

A Yes.

Q Would you please state your name and your present business occupation.

A Gordon J. Morrison, Superintendent of Steam Plants, Wisconsin Public Service Corporation.

Q Would you briefly describe for me your educational background and your employment experience?

A I graduated from Marquette University in 1929 with a chemical engineering degree. I started to work for Public Service that fall.

Would you like to know some of my work history?

Q Yes, if you would, please.

A I started as a chemist with Public Service and then went to Results Engineer at the Pulliam plant, was Superintendent of the Oshkosh steam plant, then Superintendent of the Weston plant, Superintendent of the Pulliam plant and am now [5] Superintendent of our three steam plants.

Q How long have you lived in Green Bay?

A I was born here and have lived here all my life except when I went to school, and eight years at Weston and four years at Oshkosh.

Q Now, I would like to ask you some general questions about Wisconsin Public Service, Mr. Morrison.

First of all, would you generally describe its electric service area?

A We serve the northeastern part of the State of Wisconsin, the southern boundaries go down to Oshkosh, and we serve gas in Sheboygan and up the east coast of Lake Michigan to Sturgeon Bay, cross over to Meno-

minee and Marinette, and west to Rhinelander, Wausau and Stevens Point.

Q Is Wisconsin Public Service an investor-owned utility?

A Yes.

Q As of the year-end 1968, approximately what was Wisconsin Public Service's generating capacity?

A I do not have the figures with me, but somewhere around 600,000 kilowatts.

Q How many coal-fired generating stations [6] do you own and operate?

A We own and operate three at the present time.

Q Could you tell us where those are located?

A Our largest station is at Green Bay, the Pulliam plant. The next one is at Weston, where we have two units. That is south of Wausau about thirteen miles. The third one, a small, old plant, is at Manitowoc.

MR. CUSACK: Excuse me. Is that the same as the Oshkosh plant?

BY THE WITNESS:

A The Oshkosh plant was a small plant that has been decommissioned.

MR. CUSACK: I see. Thank you. Excuse me.

MR. HEDLUND: Will the Government stipulate that Wisconsin Public Service is not a coal consumer within the relevant market alleged by the Government at issue in this case?

MR. CUSACK: No.

BY MR. HEDLUND:

Q Do you have generating plants at present that burn fuel or use energy other than coal?

[7] A Our Western plant burns gas, natural gas, when it is available.

Q What other generating facilities do you have?

A We have sixteen small hydro plants located in our territory, on the Peshtigo River, the Menominie River and the Wisconsin River.

Q Do you have an interest in any other company that operates hydroelectric generating stations?

A We have a one-third interest in the Pettenwell and Castle Rock plants, that have a capacity of about 35 megawatts, on the Wisconsin River.

MR. CUSACK: May I ask a question, please?

MR. HEDLUND: Yes.

BY MR. CUSACK:

Q Is 35 megawatts equivalent to 35,000 kilowatts?

A Yes.

MR. CUSACK: Thank you.

MR. HEDLUND: Mr. Cusack, you have been in this case long enough so that you should know that by now.

MR. CUSACK: I thought it would be appro- [8] priate to insert it at this point in the record, however.

BY MR. HEDLUND:

Q Do you have any generating facilities that use diesel fuel?

A We have two diesel installations, one at Eagle River and one at Rhinelander.

Q In the year 1968 can you tell me approximately what percentage of your generating capacity was represented by generating stations using hydroelectric power or diesel fuel, and I also want you to include in that your interest in the two hydroelectric facilities that you mentioned previously. Do you understand the question?

A I am not too clear on it. You want the amount of generation by hydro, gas and diesel?

Q Yes, including your part ownership or interest in the Wisconsin River Power Company.

A Offhand I would say about 30 per cent.

Q Wisconsin Public Service also sells gas, does it not?

A Yes.

Q At present, or in 1968, who was your largest gas customer?

[9] A I believe the American Can Company, Northern Paper Mill Division, was our biggest gas customer.

Q Where is that located?

A That is in Green Bay.

Q How long have they been a gas customer?

A Only about a—well, they have used gas in their

dryers for some years, maybe five or six years, but as to gas as a fuel for generation, it has only been about a year.

Q What did they use for generation prior to that?

A They burned coal.

Q When you say "generation", this is for electrical generation?

A Yes; electrical generation.

Q Do you know approximately how many tons of coal a year they consumed before they converted to gas?

A I believe they consumed from 150,000 to 200,000 tons a year.

Q How do you know that?

MR. CUSACK: The Government objects and moves to strike on the basis of lack of first- [10] hand knowledge.

BY MR. HEDLUND:

Q How do you know that?

A Well, I have seen the boats come in right across the river from us, and I have been in their plant, and I would assume that that is about what the coal consumption was.

MR. CUSACK: I renew my objection and move to strike.

BY MR. HEDLUND:

Q Do you presently have under construction a nuclear fuel generating station?

A Yes.

Q Where is that to be located?

A In Kewaunee County, about six or seven miles south of the city of Kewaunee, Wisconsin.

Q Are you constructing that by yourself, or in connection with other utilities in Wisconsin?

A We have two other partners, Wisconsin Power & Light Company and Madison Gas & Electric, that are part owners and will share in the output of the plant.

Q What will be the rated capacity of that plant when it is completed?

A 527,000 kilowatts.

[11] Q When do you project that that will be completed and on line?

A We are expecting to get it on the line in the fall of 1972.

Q When that plant is in operation, can you tell me what percent then of your base load will be nuclear generated?

A Our plan is to run the nuclear plant at full capacity when it is available, and then you would like to know what part—

Q What percentage of your system's total base load then would be nuclear generated.

A Of course, our part of this 527,000 is 40 per cent, so it is on the order of about 200,000 kilowatts that will be Public Service generation, and our capacity, including that 200,000, and our part ownership in Edgewater would be about 200,000 out of 900,000.

Q Putting aside the Edgewater plant, when the Kewaunee nuclear plant becomes fully operational, will this result, in your judgment, in a lessening of coal consumption by Wisconsin Public Service Company?

A Yes.

[12] MR. CUSACK: The Government objects to the question on the grounds that it is leading.

MR. HEDLUND: You may answer the question.

BY THE WITNESS:

A We expect the nuclear generation to be cheaper than generation by coal.

MR. HEDLUND: May I have the two preceding questions and answers read, please, Mr. Reporter.

(The record was thereupon read by the Reporter as above recorded.)

MR. HEDLUND: Thank you.

BY MR. HEDLUND:

Q Mr. Morrison, what remains of the market for coal for home heating in Green Bay at the present time?

A Well, it has been declining, due to the conversion to natural gas by many of the residences in the city.

Q Has Wisconsin Public Service been increasing its number of residential heating customers steadily through the years?

A Yes.

Q Has this been principally at the expense [13] of coal?

A Yes.

Q Can you give me approximately the annual total coal consumption for your Pulliam plant each year for the past three years? I do not want to hold you to exactly accurate figures, but generally, if you can tell us.

A I think in 1967 we got 956,000 tons for Pulliam, in 1968 it was 968,000 tons and this year we are figuring on about 990,000 tons.

Q In those years was all of that coal produced from mines located in the midwest?

A No. Some of it is eastern coal.

Q Can you tell me roughly the percentage of eastern coal that was burned in those two years?

A Approximately 40 per cent came from eastern suppliers and 60 per cent from Illinois.

Q How is coal—

A I might revise that a little bit because last year we did not get all we ordered from Illinois because of the Belt Line strike, so we had to supplement that with coal from the east.

Q Could you explain why the Belt Line strike was a factor? You are referring, are you, to the [14] Chicago Belt Line?

A Yes. All of our coal is shipped from the mine to Chicago and transferred to the Belt Line, who bring it to the Rail-to-Water unloading or reloading port, where it is loaded into boats.

The Belt Line was on strike for about 100 days, and during that period we did not get any coal from Illinois.

MR. CUSACK: Off the record, please.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. HEDLUND: On the record.

BY MR. HEDLUND:

Q When you stated that all of your coal comes to the Belt Line, you were referring to coal from midwestern mines?

A Yes. In the east, of course, there are a number of loading docks owned by the railroads, the C. & O., the B. & O., the Norfolk and Western.

Q How is coal delivered to the Pulliam plant?

A All of our coal at Pulliam is received from self-unloading vessels.

[15] Q Lake vessels?

A Yes, lake vessels.

Q Is the plant able to receive coal by rail?

A No.

Q With respect to the midwestern coal that you buy, where do you take title to the coal, or where do you buy the coal?

A We buy the coal loaded into vessels.

Q At Chicago?

A At Chicago or at Lake Erie ports.

Q Typically, how many tons of coal are brought in by each vessel?

A Anywhere from 12,000 to 19,000 tons per boat.

Q I assume, then, that you pay the transportation costs from Chicago or from Lake Erie ports?

A Yes. We pay the lake carrier ourselves.

Q Is there any benefit to you to have a boat fully loaded in making a shipment to you, or does it matter?

A It doesn't make much difference to us, except that the boat owner wants his boats filled in order to economically transport coal.

[16] Q How is your transportation cost determined? Is it the number of tons in the vessel or do you pay per vessel, or how is it done?

A No. We pay per ton in the vessel, so it does not make that much difference to us, but it does to the boat owner, who wants to make sure the boats are fully loaded.

Q Will they bring a half-loaded boat to you?

A No.

Q Now, could you tell me the characteristics of the coal for your Pulliam plant which you require on a contract basis, that is, the characteristics of the coal that you contract for.

A We prefer to have coal with a BTU of somewhere between 12,000 and 14,000 BTU per pound, and ash, of course, as low as we can get it. 6, 8 or 10 per cent is probably typical. We prefer to have low sulfur coal.

Q Why are these characteristics important to you?

A We use pulverizers on all our boilers and if the BTU is too low, we can't get full capacity out of the boiler, and of course, that [17] cuts down our generation.

Sulfur is important because we have to keep the exit gas temperatures from the chimneys higher with high sulfur coal.

Ash disposal is a problem. We collect the fly ash with electrostatic precipitators and we have to dispose of it, and it costs us from 25 to 30 cents a ton to dispose of ash.

Q With respect to Pulliam, is there any benefit to Wisconsin Public Service having—strike that.

Q Is there any benefit to Wisconsin Public Service in being able to purchase coal from both the east and midwest?

A Yes. We believe there is. We can negotiate prices between the two locations quite readily.

Q To your knowledge, have you ever contracted for coal produced in the Fulton-Peoria County area in Illinois, in the Central or Springfield area, or in the so-called Belleville Freight Rate District of Illinois?

A We have never contracted for Fulton County coal. We did contract for some Murdock [18] coal, but I am not sure if Murdock is in Illinois.

Q I was not including Murdock, no. I was confining it to the mines near or around Springfield.

A No. We never contracted for Fulton County coal.

Q What about the Belleville area, the Belleville Freight Rate District?

A There again, I say I am not sure where Murdock is.

Q Murdock is over in the eastern portion of the State.

A No. We never contracted for coal from the Belleville District.

Q Why is that, and I ask this question for all three of the districts I have named.

A Well, we have usually wanted coal close to 12,000 BTU or over.

Q Have you ever contracted for Indiana coal?

A No. We never contracted for Indiana coal for our Pulliam plant.

Q Why is that?

A The price is usually higher than Southern [19] Illinois coal.

Q What about West Kentucky? Have you contracted for West Kentucky coal for Pulliam?

A We have not contracted for it. We have used it as a substitute, and there again the price is usually higher than Illinois coal—the freight rate is higher, I should say, not the coal itself. The freight rate makes it higher.

Q Have you ever considered United Electric Coal Companies on its own as a potential supplier for your Pulliam plant?

A As far as I know, we have never been contacted by United Electric, to buy their coal.

Q If United Electric produces no coal with a BTU value approaching 12,000, would you consider them a potential supplier?

A No.

Q What would happen were you to use, in your equipment at Pulliam, a low BTU high ash coal?

A We would have trouble getting full capacity out of our generators, because of not being able to pulverize it fast enough to keep the load up.

Q Would you have any maintenance problems?

[20] A I don't believe so, except if the ash fusion was low, we could get slagging.

Q Now, I would like to turn to your Weston plant. I know you have mentioned this before, but Weston is located where?

A Weston is about 13 miles south of the city of Wausau, on the Wiscosin River.

Q Approximately what has your total coal consumption been running there in the last two years or so?

A About 125,000 tons a year.

Q What is the generating capacity of that plant?

A We have two generators, one with a capacity of about 70,000 and the other, 90,000 kilowatts.

Q Over the past two or three years or so, approximately what per cent of the fuel burned to generate electricity at Weston was gas?

A In the last couple of years?

Q Yes.

A The gas amounted to about 65 per cent of our fuel at Weston.

Q Was gas burned throughout the year or only in the summer months?

[21] A In the summer months we have gotten gas almost continuously. In the cold weather our load dispatcher often has to take us off of gas for periods sometimes of a couple of months, sometimes for a week here and there, and sometimes for only a day or two.

Q How has your fuel cost experience at Weston been between coal and gas?

A Coal at Weston at the present time is about 36 cents per million BTU's and we are getting gas for 28 cents per million BTU's.

Q Is there ever a time at Weston when you are burning coal and gas at the same time?

A Yes.

Q Could you explain to us how that comes about?

A Our No. 2 boiler, which is the largest of the two, has gas burners and coal burners.

We have three pulverizers that supply nine burners and we can run one pulverizer with three burners on coal and the other six burners on gas, or six burners on coal and three on gas, or completely on gas or completely on coal.

Q How is coal delivered to the Weston plant?

[22] A It is all delivered by rail.

Q Are you able to obtain a volume or unit train rate for the coal shipped to Weston?

A As yet we have not been able to get a unit train setup for Weston.

Q Why is that?

A Well, one of the reasons is that the unit trains want to run on a schedule, and with us burning gas over there we can't give them a schedule for the year-around delivery of coal.

Q Is BTU as important a consideration at Weston, the BTU value of the coal, as important a consideration at Weston as it is at Pulliam?

A Pretty much the same. We have pulverizers in both places.

Q Again with respect to United Electric, if it were the fact that United Electric produces no coal having a BTU value of approximately 12,000 BTU, would you consider United Electric as a potential supplier for that facility?

A We would have trouble keeping a full load on the units with coal that was less than 12,000 BTU's per pound.

Q With respect now to the plant at Manitowoc, [23] approximately how many tons of coal do you burn there a year?

A From 7,000 to 10,000 tons per year.

Q Where is that coal produced?

A That's eastern coal that we buy from Reiss Coal Company.

Q Why do you confine the burn at that plant to eastern coal?

A It is necessary that we have high BTU coal, as we have stokers in this plant, and should get coal that has high fusion temperature, and we try to get 13,000 BTU or better there.

Q During the past two years or so were you visited by representatives of Humble Oil & Refining Company?

A Yes.

Q What was the purpose of their visit?

A They wanted to see if they could sell us coal during this period when they were developing coal mines, before they got into production of liquid fuel or gaseous fuel.

Q Where was the coal to be located that they were talking to you about?

A I believe in Southern Illinois, although [24] it was a low BTU coal.

Q Did you express an interest in that coal?

A No. We thought it was too low a heating value for our needs.

Q Is Wisconsin Public Service Company concerned about the air pollution problem?

A Yes, we are.

Q Could you tell us briefly what measures you have taken or what you have under way to improve that situation?

A At the present time we have precipitators, electrostatic precipitators, on six of the units at Pulliam.

Our two older units, which are not used very often, have no precipitators.

At Weston we have no precipitators, but we are running a study at the present time to see if we should install precipitators or if it is possible to get enough gas to run both units with gas.

Q In your decision to enter into this joint venture to construct a nuclear fuel generating station were air pollution considerations one of the factors in making that decision?

[25] A It was a factor, yes.

Q Have you had an opportunity to study developments with respect to controlling sulfur oxide emission at coal-fired generating plants?

A Yes. I am a member of the Prime Movers Committee of the Edison Electric Institute, and we have heard the discussion by Union Electric at one of our meetings telling of their experiments in St. Louis.

Q Is that the combustion engineering process?

A That is the combustion engineering process.

Q What is your understanding as to the efficacy and the state of that development at Union Electric?

MR. CUSACK: I object to that on the ground of hearsay.

MR. HEDLUND: You may answer.

BY THE WITNESS:

A They have a lot of problems, and I think they are slowly solving some of them. Whether it is going to be a

successful means of avoiding sulfur oxides, the air pollution by sulfur oxides, I don't know.

As you know, there are a lot of experiments that have been going on all over the country, to see [26] what can be done about removing sulfur oxides from coal gases.

Q In your opinion, Mr. Morrison, with respect to the business of Wisconsin Public Service, does coal compete with other forms of energy such as nuclear energy, natural gas and oil?

A Well, in our case we can get natural gas cheaper than coal. Of course, we can't get the quantities to run all our boilers on natural gas.

We decided to build a nuclear plant because we thought it would be cheaper power than we could produce with coal. I think fuel oil is out of the question, it is so high up here. We only use fuel oil to start up boilers.

Q With that, then, does coal compete with nuclear energy and natural gas as far as your system is concerned?

A Yes.

Q In your opinion, Mr. Morrison, has the common ownership of Freeman Coal Mining Corporation and United Electric Coal Companies had any adverse effect upon Wisconsin Public Service?

[27] A None that I know of.

Q In your opinion, can you conceive of any benefit to Wisconsin Public Service that would follow from a divestiture of United Electric Coal Companies from General Dynamics?

A Nothing that I know of.

MR. HUDLUND: You may inquire.

CROSS EXAMINATION

BY MR. CUSACK:

Q Mr. Morrison, in regard to your Manitowoc plant, that is a very old generating station, is it not?

A Yes. It was built in 1917.

Q Your company did plan to close this down, did it not, until the demand for power so increased?

A Yes. We are still, and have been for years, studying the need to keep it active.

Q Would you say that it is a fairly marginal generating station at the present time?

A Yes.

Q Now, the Manitowoc plant, you say, receives eastern coal?

A Yes.

* * * *

[28] Q Do you have any plans to build any more hydroelectric plants?

[29] A No, we do not.

Q Now, Mr. Morrison, you testified that your company has a portion of the Edgewater plant, is that correct?

A Yes.

Q Where is that located, sir?

A At Sheboygan.

Q Is that south of Sheboygan on Lake Michigan?

A Yes.

Q Who owns that plant now, sir?

A Wisconsin Power & Light own the first three units.

Q I see.

A We are going to be part owner of the fourth unit.

Q How many kilowatts are burned in the fourth unit at this Edgewater plant?

MR. HEDLUND: Are you sure you want to ask how many kilowatts are burned?

MR. CUSACK: All right.

BY MR. CUSACK:

Q What is the kilowatt capacity?

A 310,000 kilowatts.

Q Is it a fact, sir, that the Edgewater [30] plant formerly purchased coal from the Reiss Coal Company?

A Yes.

Q Has this situation changed?

A Yes.

Q What is the situation now, sir?

A As I understand it, they are going to buy their own coal cars and get coal from Fulton County, the Peabody Coal Company.

Q This will be brought up from Fulton County by unit train, will it not, sir?

A Yes.

Q And that is on the Northwestern?

A On the Northwestern, yes.

Q All of the Edgewater plant, including the fourth unit which you have a one-third interest in, will be supplied by the Fulton County coal, will it not, sir?

A Yes.

Q So at Edgewater, if the fourth unit has a 310,000 kilowatt capacity, you would receive a third of that, so you would receive over 100,000 kilowatts from the Edgewater plant—

A Yes.

* * * *

[42] Q Started using Illinois coal?

A Yes. I think it was after the war.

Q After the war.

A Yes.

Q So now the percentage is 60 per cent midwest coal and 40 per cent eastern coal, is that correct, sir.

A Yes, except for last year, when we had the Belt Line strike, which I explained.

Q Mr. Morrison, has your company faced increasing difficulties in being able to obtain coal?

A Yes.

Q Is it your opinion, sir, that there is a shortage of coal?

A Yes.

Q Would you say that this was a serious shortage?

A I am afraid it is. We are especially vulnerable because of not being able to get coal by rail during the wintertime, and if we don't get it during the navigation season, we are in [43] trouble.

Q It is a fact, is it not, sir, that you had some discussions with officials from the Truax-Traer Division of Consolidation Coal in regard to possibly acquiring or purchasing some coal from their Montana mine?

A Yes; Consolidation Coal Company.

Q This is a Montana mine that is supplying coal to one of the utilities of Northern States Power?

MR. HEDLUND: Now, who is testifying here, Mr. Cusack, you or Mr. Morrison?

BY MR. CUSACK:

Q Is that correct, sir?

MR. HEDLUND: I object to that.

BY MR. CUSACK:

Q Is this mine, sir, of Consolidation the mine in Montana that is supplying coal to one of Northern States Power's generating stations in Minnesota?

A Yes.

MR. HEDLUND: The same objection. I think this is outrageous, Mr. Cusack, your testifying this way. You are not under oath.

[44] BY MR. CUSACK:

Q What is the BTU rate of the coal mined in Montana that is supplying that Northern States Power plant, do you know, sir?

MR. HEDLUND: I object on the basis that no foundation has been laid for Mr. Morrison's knowledge with respect to that.

BY THE WITNESS:

A I was told that it would be under 10,000 BTU's per pound.

MR. HEDLUND: I move to strike.

BY MR. CUSACK:

Q Who told you that, sir?

A The salesman of Consolidation Coal Company.

Q In a conversation that you had with him?

A Yes.

Q Thank you.

Now, sir, assuming that the shortage of coal continues, and assuming that you are able to blend Fulton County coal with the higher BTU coal from the east, you anticipate that there is a serious possibility that you may have to purchase Fulton County coal to supply your generating stations?

[45] MR. HEDLUND: Which generating stations?

MR. CUSACK: Please answer the question.

BY THE WITNESS:

A Any kind of coal would be better than no coal at all.

BY MR. CUSACK:

Q Is this getting to be the situation, that there is becoming no coal at all?

A Well, we are so far pretty well on schedule with our coal deliveries, but coal salesmen seem to indicate that the miners may have more work stoppages and we may find ourselves getting pretty short by the time the fall comes around.

Q You anticipate, then, that you may have to use lower BTU coal?

A It is possible, yes.

Q Is it possible, then, that you also may have to use Fulton County coal?

A Well, like I say, we would use anything if we were desperate.

Q You may even have to use coal from Montana?

A We would have to.

Q What is the BTU on that again, about?

A Under 10,000.

[46] Q Sir, is there any possibility that your Pulliam plant here in Green Bay could at some time get a unit train rate from Illinois mines as the Edgewater plant has received a unit train rate?

A It is possible. We have studied it a number of times in the late years, but so far it is not economical.

Q At the present time?

A At the present time.

Q Have you studied the possibility of changing your boilers at Pulliam to take all midwest coal?

A No, we have not. We know it would be quite costly to convert them.

Q You testified, sir, that the acquisition of United Electric by General Dynamics did not, as far as you know, harm your company.

MR. HEDLUND: I object to that as a false characterization of Mr. Morrison's testimony.

MR. CUSACK: I would like to pose a hypothetical question to you, sir.

BY MR. CUSACK:

Q Assuming a Midwest coal producer was acquired by another corporation and this other corporation, the parent company, made no efforts [47] to increase the mining capacity or production of this coal company, or to open up new mines, develop new coal reserves to increase the production of that company, would you consider this to be harmful to the public utilities in the midwest, including your own company?

MR. HEDLUND: May I have the question read, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A I believe it would be. Public utilities are burning more coal every year and consequently the coal miners have to produce more.

BY MR. CUSACK:

Q And there is a shortage, is there not?

A There is a shortage, definitely.

Q Mr. Morrison, the Pulliam plant here at Green Bay does burn high sulfur coal, does it not?

A Yes.

Q And you have electrostatic percipitators here at Pulliam?

A Yes, on six of the eight units.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF JOHN SAMUEL MOORE, TAKEN JUNE 20, 1969

* * * *

MR. IRVING: Miss Jasiorkowski, would you swear the witness, please.

(The witness was thereupon duly sworn.)

JOHN SAMUEL MOORE,

called as a witness by the defendants herein, having been by me, the said Joyce Jasiorkowski, as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. IRVING:

Q Will you please state your full name, sir.

A John Samuel Moore.

Q What is your current home address, Mr. Moore?

A 105 Linden Lane, Springfield, Illinois.

Q What is your current occupation and position?

A I am a sanitary engineer 4, with the Illinois State Health Department in the Bureau of Air Pollution Control, which is housed in the Division of Sanitary Engineering. I am currently the project administrator for the Illinois Coal Study, which started on March 1st of this year.

Q Are you appearing for this deposition this [4] afternoon pursuant to a subpoena, Mr. Moore?

A Yes, I am.

Q What is the nature of your duties as a sanitary engineer for the Bureau of Air Pollution?

A Basically, my duties now are mainly administrative. I have eight engineers who work for me. I schedule investigations for them, I check over their work, their reports, the permits that they write. I also serve as a coordinator for the data processing programs for air pollution, and act in some degree as a liaison with the Federal Government in air pollution matters.

Q Would you please describe the connection that your position has to the Illinois Air Pollution Control Board?

A Yes. The Illinois Air Pollution Control Board is an independent agency which has nine members appointed by the Governor. The Bureau of Air Pollution Control is the technical staff for that Board. We do all of the investigative work and essentially all of the work of the Board except the final policy making. The Chief State Sanitary Engineer, who is my superior, is the Technical Secretary for the Illinois Air Pollution Control Board.

[5] Q Mr. Moore, would you please describe briefly your educational background and professional experience.

A I received my Bachelor of Science degree in 1961 from the University of Illinois and worked as a field engineer for a period of one year for the Northeastern Illinois Metropolitan Area Planning Commission. Prior to that, I was connected with the Atomic Energy Commission and worked at the Nevada Proving Grounds in environmental health related to radiation. That experience led me to the Department of Public Health in Springfield, Illinois, to what was then the Bureau of Radiological Health and Air Pollution Control. At that time there was no air pollution law in Illinois, but it was established in 1963, and I have worked in the air pollution field in the State since its inception.

Q Do you consider yourself knowledgeable and expert in the field of air pollution control?

A Yes, I would say so. I was fortunate to get in on the ground floor.

Q Mr. Moore, could you please describe the current Illinois air quality regulatory scheme?

[6] A The Illinois Air Pollution Control Act places the responsibility for the control of air pollution in Illinois with the Illinois Air Pollution Control Board. As I stated earlier, the technical staff of the Board of which I am a member serves that agency, in investigative work and hearing matters and so on.

If we receive a complaint of air pollution, we are charged by law with investigating that complaint and try, through conference and conciliation, to reach some successful conclusion. If conference and conciliation does not work out, then the Board may call a hearing if the Technical Secretary files a formal complaint with the

Board. The Board may then make a final order or determination, and if that final order or determination is violated, then the Board turns the matter over to the Attorney General of the State for injunctive relief or fines.

Q Is the Air Pollution Control Act state-wide in its application?

A Yes, it is, with the exception of the provision in the Act which allows for a variance—I am sorry—an exemption to certain political sub- [7] divisions in the State if they qualify by having an ordinance which is in substantial agreement with the State regulations or more stringent, and if they can prove to the State that they are pursuing this ordinance to the best of their ability in controlling air pollution.

Q By "pursuing this ordinance", would that go to the enforcement of the ordinance?

A Yes.

Q Has a certificate of exemption been issued to the City of Chicago?

A Yes, it has.

Q What enforcement powers does the Board have under the Illinois statute?

A Well, basically, as I stated before, the Board may cause to be instigated in a court of competent jurisdiction through the Attorney General's office, injunctive relief and/or fines.

Q Mr. Moore, does the current Illinois law make provision for the granting of a variance to a given air pollution source?

A Yes, it does.

Q Could you describe that provision briefly, sir?

[8] A A variance may be granted to a party or an industry if they can show that there is no other method currently available to solve their problems, and if they can show that definite progress is being made toward the eventual elimination of the problem that they have, we will grant a variance, generally for a six-month period, but they can be renewed.

Q Going back for a minute, sir, you mentioned that the City of Chicago had been granted a certificate of

exemption. Could you please describe the basis for this granting of an exemption to the City of Chicago?

MR. SIMS: I will have to object to this, counsel. You have not established that the witness is in any position of authority to grant exemptions or make policy decisions whatsoever. He testified he is on the technical staff, and I think the policy decisions should be asked of the members of the Board.

BY MR. IRVING:

Q Mr. Moore, do you know of your own knowledge that the City of Chicago has received a certificate of exemption?

A Yes.

[9] Q If you know the basis of that exemption, will you please describe it for us at this time?

MR. SIMS: I object to that.

BY MR. IRVING:

Q You may answer, sir.

A The basis, as I understand it, for granting an exemption to the City of Chicago was that the ordinance under which the Department of Air Pollution Control operates was in substantial agreement with the State regulations as far as the definition of air pollution is concerned, and in some instances as stringent as the State regulations, and in some instances even more stringent, and further, based upon an agency that is operating and doing what in the Board's estimation is a creditable job.

Q Mr. Moore, in your capacity as liaison between the Illinois Bureau of Air Pollution Control and the National Air Pollution Control Administration, have you become familiar with the interrelationship of the State and Federal Air Pollution Abatement and Control programs?

A Yes.

Q What is the nature of the involvement of the Federal Government in sulfur oxide pollution [10] control in Illinois?

MR. SIMS: I will have to object to this, counsellor. We took the deposition of John Middleton, and I think the witness will agree that he is much more competent

in this area to testify and he did so testify in his deposition.

MR. IRVING: I think the record will show that my question specifically asks of the Federal involvement in the State of Illinois. Mr. Moore has testified that he has acted as a liaison between the two governmental regulatory bodies, and I think he is eminently well qualified to testify to that fact.

MR. SIMS: As long as he restricts it to the State of Illinois.

MR. IRVING: Miss Reporter, will you please re-read the question for Mr. Moore.

Q (Read by the Reporter.)

BY THE WITNESS:

A Two areas involving this State have been designated by the Federal Government as part of an interstate air quality region. The six-county north- [11] eastern Illinois area is involved in one of these regions, and three counties, consisting of Madison, St. Clair and Monroe counties in the metroeast part of the State are involved in the other area.

As part of that designation, the Federal Government issued criteria documents which gave the states a basis on which to develop their quality standards and certain methodology to reduce the levels of sulfur dioxide and particulates in these two areas in which the State is participating.

Q What is the duty or the nature of the participation of the State of Illinois in these designations?

A Basically, the designation sets up a timetable consisting of first a 90-day period in which the states have an opportunity to transmit to the Federal Government a letter of intent, which is exactly that, stating their intention to participate or not participate in these regions.

After that initial 90-day period, a 180-day period is allowed for the states to set an air quality standard. That's the period that we are now in, in the Chicago area.

After that first 180-day period, a second [12] 180-day period is allowed for the states to develop the methodology

and set the emission standards to reach the air quality standards which presumably would have been acceptable to the Federal Government.

Q Sir, when you say that the State is currently in the first 180-day period with respect to the Chicago area, does that mean that it has transmitted its letter of intent to comply with Federal directives with respect to that area?

A In the Chicago area, yes.

Q Where does the State Government now stand with respect to the timetable as to the St. Louis Metropolitan area?

A We are still in the 90-day period. We have not transmitted the letter yet.

Q In your opinion, Mr. Moore, is it likely that the State of Illinois will comply with Federal directives?

A Definitely.

Q In your opinion, Mr. Moore, is it likely that the State, in complying with these Federal directives, will confine the scope of its regulation of sulfur oxides only to the Chicago and St. Louis [13] areas?

MR. SIMS: I will object to that. As I said before, first it is leading and secondly, the witness is not in a policy-making position and would not know what the policy makers will do. It is pure speculation.

MR. IRVING: I believe the record will demonstrate Mr. Moore's qualifications to answer this question.

Would you like the question repeated, Mr. Moore?

THE WITNESS: Yes, please.

MR. IRVING: Miss Reporter, would you please read the question.

Q (Read by the Reporter.)

MR. SIMS: I repeat my objection.

BY THE WITNESS:

A It's my opinion that the regulations both on sulfur dioxide and particulates, speaking to air quality standards, will be state-wide.

BY MR. IRVING:

Q In your opinion, Mr. Moore, is it likely that the State, in complying with the Federal directive, will enact a regulation which incorporates a [14] sulfur content restriction?

MR. SIMS: Again, the same objection.

BY MR. IRVING:

Q Would you please answer the question.

A In my opinion, that's true.

MR. SIMS: Would you repeat the last question, please.

Q (Read by the Reporter.)

BY MR. IRVING:

Q Mr. Moore, when you say that is true, do you mean it is likely?

A It is likely that there will be a sulfur limitation on fossil fuels.

Q Mr. Moore, in your opinion and to your knowledge as liaison in the air pollution control field for Illinois to the Federal Government, will the increase in Federal supervision have any effect on the variance provision presently incorporated in the Illinois statute?

MR. SIMS: Could I have that question back, please.

Q (Read by the Reporter.)

MR. KEMPF: Off the record.

(There was a discussion off the record, [15] after which the taking of the deposition was resumed as follows:)

MR. KEMPF: On the record.

MR. SIMS: Again, I object. The witness is not in a position to give opinions on these matters.

BY MR. IRVING:

Q Mr. Moore, would you please answer the question.

A Yes, I am certain that this will affect the variance procedures, but in any event, it is the plan of the State to tighten up on the variance requirements anyway.

Q By "tighten up", would you please explain what you mean a bit more fully, sir.

A In many cases the variance situation has already served its purpose. It was mainly directed at open burning situations throughout the State, and many of these cases have already been cleared up. We, therefore, would severely tighten the procedures for getting a variance and for granting a variance, and in no cases where air pollution would be caused could we allow a variance.

Q Mr. Moore, in your opinion, and to your [16] knowledge as liaison for Illinois to the Federal Government on the subject of air pollution control, will the advent of Federal supervision be likely to lead to any other changes in the State regulatory pattern?

MR. SIMS: The same objection.

BY MR. IRVING:

Q You may answer, sir.

A Yes, I am certain that they will. We are already feeling these changes in our relationships to the air quality regions.

Q Is it likely that the enforcement powers will be broadened?

MR. SIMS: Same objection. Also, it is leading.

BY MR. IRVING:

Q Mr. Moore, you may answer.

A The Board has asked that Illinois Air Pollution Control Act be amended by the current legislative session to strengthen the enforcement procedures, and I am sure as time goes on we will be asking for more stringent enforcement measures to be given to the Board.

(There was a short interruption, after [17] which the taking of the deposition was resumed as follows:)

BY MR. IRVING:

Q Mr. Moore, is the combustion of coal the primary source of sulfur oxide pollution in the City of Chicago?

MR. SIMS: Objection. It is leading.

MR. IRVING: On what grounds?

MR. SIMS: Leading, counsellor.

BY MR. IRVING:

Q You may answer, Mr. Moore.
A Yes.
Q Sir, on what basis do you conclude this?
A On emission inventory data collected both by the State and by the City of Chicago.
Q Sir, what is the principal source of sulfur oxide pollution in other urban areas in Illinois?
A With some minor—
MR. SIMS: What other urban areas, counsel?
MR. IRVING: Throughout the State.
MR. SIMS: Has it been established that there is pollution in other urban areas throughout the State?

(There was a short interruption, after [18] which the taking of the deposition was resumed as follows:)

BY MR. IRVING:

Q Mr. Moore, do you understand the question that I have asked?
A I would like to have it repeated, please.
MR. IRVING: Miss Reporter, will you please repeat the question.
Q (Read by the Reporter.)
MR. SIMS: I again renew my objection. It has not been established that there is any sulfur oxide air pollution in the other areas.
MR. IRVING: I will rephrase my question.

BY MR. IRVING:

Q Mr. Moore, is there sulfur oxide pollution in other urban areas in the State of Illinois?
A Yes.
Q Where it exists, what is the primary source of this pollution in these urban areas?
A With several exceptions, combustion of coal is a primary source of sulfur dioxide.
Q Mr. Moore, does the washing process remove much of the sulfur content of Illinois coal?
MR. SIMS: What type of washing process, [19] counsel?

BY MR. IRVING:

Q Mr. Moore, when I use the term "washing process", are you generally familiar with what I am referring to?

A Yes.

MR. SIMS: I think for the purpose of the record, counsel, you ought to clarify that.

MR. IRVING: Since Mr. Moore is familiar with the term as I used it, I will ask him to answer the question.

MR. SIMS: The Judge might not, though, counsellor. It can be a very confusing record if he does not understand the term.

MR. IRVING: I do not believe that would be the case.

BY MR. IRVING:

Q Mr. Moore, would you please answer the question.

A Would you give me the question again, please?

MR. IRVING: Miss Reporter, will you please read the question.

[20] Q (Read by the Reporter.)

BY THE WITNESS:

A If you refer to washing as meaning removing the surface impurities of coal by one or more means, it does remove the pyritic sulfur content of coal. However, basically, Illinois coal consists of both pyritic and organic sulfur, of which organic sulfur is more pronounced. You cannot make low sulfur coal out of high sulfur coal by washing it, as a general statement.

MR. IRVING: Will you please read back the last sentence of Mr. Moore's answer.

A (Read by the Reporter.)

MR. IRVING: Thank you.

BY MR. IRVING:

Q Mr. Moore, what is the current state of the art in the development of either pre-combustion processes or stack retention processes which minimize the organic sulfur content of high sulfur coal?

MR. SIMS: I am going to have to object, counsellor. I know the witness has some knowledge on this and I

think anybody would who reads publications about it, but we took the deposition, as I said before, of Mr. Middleton and I think [21] he was much more knowledgeable in this area and I do not believe the witness would dispute that Mr. Middleton should know more about the research and development of control techniques than he does.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

MR. IRVING: The only question you have raised, counsel, is whether or not this witness is qualified to answer this question. On that there can be no dispute and I ask Mr. Moore to please answer the question, if he will.

MR. SIMS: I again object because you have not laid the proper foundation for asking for this information. He has not testified that he is a mechanical or combustion engineer, or that he has any special expertise in the development of these control techniques.

MR. IRVING: I think the record will show Mr. Moore's qualifications, eminent qualifications, and I ask the Reporter to please repeat the question.

Q (Read by the Reporter.)

[22] BY THE WITNESS:

A To my knowledge, there are several pilot plants being operated throughout the United States together with many blueprint ideas concerning the removal of sulfur dioxide from gas streams. One pilot plant is operating in Illinois in this area. It's known as the "red mud process. This is being done under partial Federal funding, as I understand it. Another process, known as the Dolomite Injection Method, is being used by Union Electric over in Meramec—I believe that's the community —in Missouri.

Our Board has had little experience with these plants, since there is only one in existence in this State and we have not had a large input of information concerning these methods.

BY MR. IRVING:

Q Mr. Moore, are you able to predict how long it will be before such a process will be both feasible technologically and practical economically?

MR. SIMS: Objection. This is highly speculative.

BY MR. IRVING:

Q You may answer, Mr. Moore.

[23] A No, I cannot.

Q Would it be accurate to assume, sir, that even when such a process is feasible, there will be some time lag before the process is installed into operation on a large scale?

MR. SIMS: What do you mean by "feasible", counsel?

MR. IRVING: Technologically feasible.

MR. SIMS: I will also object to that as leading the witness.

BY MR. IRVING:

Q You may answer, Mr. Moore.

A It's been our experience as an enforcement agency that there is a large time lag between the development of processes and the actual implementation of them in pollution situations.

Q Can you estimate at this time what the cost of installation and operation of such a process, if and when successful, will be?

MR. SIMS: Objection. That is speculative and you have not laid the foundation for asking him these kinds of opinions.

BY MR. IRVING:

Q You may answer, sir.

[24] A Not at all.

Q Sir, at the present time is the burning of low sulfur coal the only available method of reducing the emission of sulfur oxides from the combustion of coal?

MR. SIMS: Object. That is leading.

BY MR. IRVING:

Q You may answer, sir.
A Yes.
MR. SIMS: Would you repeat the question, please.
Q (Read by the Reporter.)

BY MR. IRVING:

Q Mr. Moore, I believe you testified earlier that you were conducting a survey on the availability of low sulfur coal in Illinois, is that correct?
A That's correct.
Q Does this survey include a study of the transportation cost elements in the marketing of coal?
A Yes.
Q Sir, why have you included such a study of transportation cost factors in this survey?
MR. SIMS: Has it been established that [25] he has included these, that he has drawn up the contract? I mean, I don't know. I am just asking.
MR. IRVING: I think when counsel reads the record he will find that it has been established that Mr. Moore is conducting such a survey.
MR. SIMS: I do not object to that. I am just objecting to his testifying as to why they were put in, because there has been no previous testimony that he has been responsible for drawing up the agreement.
MR. IRVING: I have asked Mr. Moore why such factors were included. If he does not know, I am sure he will state so.

BY MR. IRVING:

Q Mr. Moore, would you like to have the question repeated?
A Yes, please.
MR. IRVING: Miss Reporter, would you please read the question.
Q (Read by the Reporter.)

BY THE WITNESS:

A Because this is a comprehensive study which will help the State agency develop the best [26] use of low

sulfur fuel resources in the State, and transportation is one of the factors we are very much interested in.

BY MR. IRVING:

Q Mr. Moore, in your opinion, will air pollution control regulation cause a shift in the marketing pattern of high sulfur coal?

MR. SIMS: May I have that question read back, please.

Q (Read by the Reporter.)

MR. SIMS: I first object because it is leading, and secondly you did not lay the proper foundation for asking the witness a question as comprehensive as this. It is also speculative.

BY MR. IRVING:

Q Mr. Moore, you may answer.

A It's my opinion that it will.

Q Sir, could you please describe what effect this will cause? What is the nature of the effect that will be caused by this?

A Limiting the sulfur content of certain fuels has already disrupted certain patterns of sales and transportation. It is my understanding that the coal industry is presently reluctant to [27] sign any contracts in the Chicago area for the next heating season because of the limitations placed upon sulfur in coal by the Chicago ordinance.

MR. SIMS: I move to strike that last answer on the grounds of hearsay.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY MR. IRVING:

Q Mr. Moore, in your opinion, is it likely that such regulation will cause a shift in the type of fuels consumed?

MR. SIMS: Objection on the same grounds as I previously stated.

BY MR. IRVING:

Q You may answer, sir.

A By "such regulation", you refer to what?

Q The air pollution control regulations.

MR. SIMS: Could you be more specific than that, counsellor? What particular air pollution control regulations?

MR. IRVING: Referring specifically to the sulfur oxide air pollution control regulations, as we have been referring to through [28] most of this deposition.

MR. SIMS: In the cities of Chicago and St. Louis? I think that is the only testimony as to sulfur oxide legislation.

MR. IRVING: My question is directed to all the areas which the witness has referred to this afternoon.

BY THE WITNESS:

A Could I have the original question back, now?

MR. IRVING: Miss Reporter, would you read back the question, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A Yes. Low sulfur fuels obviously become much more attractive to people, particularly if they are involved in air pollution problems with the State concerning our present regulations, which limit the discharge of particulate matter, becomes attractive to not only solve the particulate problem, but to go one step further looking into the future and use a low sulfur fuel conversion which will get them off the hook for many years to come.

MR. IRVING: Defendant has no further [29] questions at this time.

MR. SIMS: Could we have a five-minute recess?

MR. IRVING: Certainly.

(Whereupon a short recess was taken, after which the taking of the deposition was resumed as follows:)

CROSS EXAMINATION

BY MR. SIMS:

Q Mr. Moore, is it your opinion that the City of St. Louis over-estimated the availability of low sulfur coal at the time they passed their air pollution ordinance?

A Yes, it is.

Q Is it your opinion that the City of Chicago overestimated the availability of low sulfur coal at the time they passed their air pollution ordinance?

A Yes, it is.

Q Regarding the title of your arrangement, I do not know if this was brought out on direct, but who is the company that is conducting this study on low sulfur coal in the State?

MR. IRVING: I will object to that, counsel.

* * * *

[39] Q Is it not a fact that a number of combinations of pollution controls can be devised to handle air pollution?

MR. IRVING: What sort of air pollution is counsel speaking of?

MR. SIMS: You have asked him about air pollution in the case in chief, counsellor, using the same term as he understands it.

MR. IRVING: When I so used that term, I did define the nature of the air pollution to which I was referring.

MR. SIMS: Several times you did not, counsellor.

BY MR. SIMS:

Q Would you answer the question, please.

A May I have the question one more time, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A Depending on what contaminant one is speaking of, yes, this is true.

BY MR. SIMS:

Q Do all of the members of your technical staff always agree on what combinations and methods [40] should be used in a particular situation?

A No. Engineers are like lawyers. They don't always agree.

Q You have no way of knowing at the present time, do you, as to what methods will be devised to control sulfur oxides in the State?

MR: IRVING: I will object to that question. Mr.

Moore testified on direct examination that that was his understanding.

MR. SIMS: He remembers what he testified to, counsel. Will you let him answer the question, please.

MR. IRVING: I will restate my objection.

BY THE WITNESS:

A Did you finish that question, or may I have it over again?

MR. SIMS: Miss Reporter, would you read the question back, please.

Q (Read by the Reporter.)

MR. IRVING: This question has been asked and answered on direct examination, and I will restate my objection on that ground.

BY MR. SIMS:

Q Would you answer the question, please, sir.

[41] A A number of methodologies could be developed.

Q But, as of the present time, of course, there is no regulation setting up any methods, is that correct?

A No.

Q At the present time the Illinois Air Pollution Control Board has adopted regulations controlling one pollutant, that of particulate matter, is that not correct?

A They have also adopted regulations pertaining to open burning violations and the quality of smoke as measured by the Ringelmann System which is opacity developed.

Q Have they adopted regulations covering any other pollutants at the present time?

A No.

Q There is technology available for removing particulate matter from fuel gases, is there not?

A Yes, there is.

Q This is utilized by some industrial burners, is this not true?

A That's correct.

Q Do you know from your own knowledge whether these regulations, that is, regulations concerning [42] particulate matter, have affected the fuel consumptions used by cement companies?

A Generally, cement companies have not been prone to convert to other fuels because they don't have the long range sulfur dioxide problem that other industries might have, because their product actually absorbs the SO_2 and is collected mechanically through wet scrubbers or electrostatic precipitators or other known devices.

Q As far as electric utilities are concerned, have particulate matter regulations greatly affected the type of fuels that they use?

MR. IRVING: What does counsel mean by "greatly affected"?

BY MR. SIMS:

Q Would you answer the question, please, sir.

A There have been conversions to gas, generally on older boilers, together with normal attrition and shutdown of older equipment. This is basically to allow the electric utilities to still use coal, but yet meet our emission standards as far as particulates are concerned.

Q Do you have any opinion as to how many tons of coal this will cut out of the electric utility [43] fuel market?

A That would be pure speculation on my part.

Q Would you say it would be minor?

MR. IRVING: I will object to that, counsel. The witness already has indicated that it would be pure speculation on his part to give a value to your question, and on that ground I object.

BY MR. SIMS:

Q Would you answer the question, please.

A I really don't have enough data to give an intelligent answer.

MR. SIMS: All right.

BY MR. SIMS:

Q Let's assume for a moment that standards concerning sulfur oxides are passed for the entire State of Illinois. They will prescribe, will they not, a certain level of air quality and then the methods to be used to obtain the air quality level if it is not already present, is that not true?

A That's essentially true.

Q Do you have any idea about what will be the sulfur oxide air quality standards if they are [44] passed?

A There is a staff recommendation to the Board. This has not been made public yet, and—

Q I do not intend to ask you for specifics, but—

MR. IRVING: Let the witness finish his statement, counsel.

MR. SIMS: Please go ahead.

MR. IRVING: Refrain from interrupting him in the middle of his statements.

BY THE WITNESS:

A (Continuing) —if at all possible, I would be reluctant to state the staff's recommendation to the Board, since our Board has not seen those numbers yet, nor has industry, nor has anyone else.

BY MR. SIMS:

Q Do you know for a fact of any area in the State other than the St. Louis or Chicago air quality control regions that are not presently within the level of air quality recommended by your staff?

MR. IRVING: May I please have that question again, Miss Reporter.

[45] Q (Read by the Reporter.)

BY THE WITNESS:

A Basically, most of the sampling that has been carried on through the State has been particulate sampling, and because of technical problems with the censors, there is not a long history of sulfur dioxide sampling. However, from the sampling that we have done, it would indicate that probably the Quad-Cities area, and by that I mean the Moline-Rock Island area and the Peoria, Illinois area, would more than likely exceed the numbers that we are proposing to the Board.

BY MR. SIMS:

Q Are there any other areas besides these two?

A There are small areas in the State, generally

caused by identifiable point sources, not always related to the combustion of coal.

Q However, is it not a fact that from the data you have collected from these two sources, this data would not be sufficient at the present time to determine for control legislation—strike that.

You stated that the data you have obtained [46] in these areas was mainlly concerned with the particulate matter and it indicated that they could exceed the staff sulfur oxide standards, but is it not a fact that you would need additional data before recommending control regulation in these areas?

A That's true, and a telemetry system is being installed in certain portiions of the State and money has been allocated to set up a complete telemetry system to sample ten to twelve different parameters at eighteen specific spots in the State, mostly in the standard statistical metropolitan areas, and this would be on-line twenty-four-hour a day sampling.

Q Would the fact that St. Louis and Chicago have been designated as air quality control regions indicate to you that these two areas have the worst levels of air pollution in the State?

A Yes, that's certainly a factor.

(There was a short interruption, after which the taking of the deposiition was resumed as follows:)

BY MR. SIMS:

Q Just so I am clear on this point, it is [47] true, is it not, that St. Louis and Chicago are presently exempt from any regulations passed by the State of Illinois Control Board on Air Pollution?

A The area enclosed by the city limits of Chicago is exempt from the Board's actions. However, the State still maintains the overall responsibility, but it's a big brother type of activity, and the other area you referred to, no area in the metroeast area is not within the control of the State. All three counties down there, which are a party to that area, are under State control.

MR. IRVING: I would like to have the answer read back, please.

A (Read by the Reporter.)

BY MR. SIMS:

Q I think you stated that you had no way of knowing at the present time what methods the Board will adopt to prevent, abate or control the sulfur oxide air pollution, but it is set out in the Air Pollution Control Act, is it not, under Section 5, that such methods must be practical and economically feasible?

MR. IRVING: Objection. I object only [48] to your characterization of Mr. Moore's prior testimony. The record, I think, will show exactly what Mr. Moore said in this area.

BY MR. SIMS:

Q Would you answer the question, please.
A May I have the question again, please.
Q (Read by the Reporter.)

BY THE WITNESS:

A Yes. The Act makes those provisions and the Board has been guided by them and must be guided by them, since it is State law.

BY MR. SIMS:

Q It is also provided, is it not, under Section 5 that the Board in making its acts and determinations must take into consideration the social and economic value of the air pollution source, is this not correct?

A Frankly, it's one of the factors that the Act states the Board will take into consideration, but I can't say how much emphasis the Board would place upon any particular—

Q Another factor that the Act sets out must be taken into consideration is the suitability or unsuitability of the air pollution source to the [49] area in which it is located, including the question of priority of location in the area involved, is this not correct?

A That is in the Act, too.

Q Also, that the technical practicality and economic reasonableness of reducing or eliminating the emissions resulting from such air pollution source?

A Yes, that's in the Act.

MR. SIMS: Could we have a five-minute break? Mr. Futterman wants to make a call.

(Whereupon a short recess was taken, after which the taking of the deposition was resumed as follows:)

BY MR. SIMS:

Q Mr. Moore, in stating your opinions on direct, were you speaking as an agent of the Chief Sanitary Engineer, or were these simply your personal opinions?

A Largely they're my personal opinions.

Q Did you claim to have any special influence over any of the nine men on the Air Pollution Control Board?

A Certainly not.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF BERNARD W. SCHOTTERS, TAKEN JUNE 23, 1969

* * * *

BERNARD W. SCHOTTERS,

called as a witness by the defendants herein, having been by me, the said Claude W. Youker, Jr., as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name, sir.
A Bernard W. Schotters, S-c-h-o-t-t-e-r-s.
Q What is your home address, Mr. Schotters?
A 737 Kessler Boulevard, West Drive, Indianapolis, Indiana.
Q Are you appearing for your deposition this morning pursuant to a subpoena, Mr. Schotters?
A I am.
Q By whom are you employed?
A I am employed by the Indianapolis Power & Light Company.
Q What is your business address?
A My business address is 25 Monument Circle, [4] Indianapolis, Indiana.
Q How long have you been with Indianapolis Power & Light Company, Mr. Schotters?
A I am completing forty-four years.
Q When did you join the company?
A In 1926.
Q Would you give us a brief description of the types of assignments and responsibilities you have had over the years?
A Well, I started out in the storeroom, and from the storeroom I came in through the Purchasing Department. I worked there and got some additional schooling and finally wound up on the executive staff level.

Q What is your current position?

A I am President of the company.

Q You mentioned you were in the Purchasing Department.

A Yes.

Q Have you ever had any experience in purchasing coal?

A Yes. All the years I was down there, I was involved with coal purchases.

[5] Q What geographic area does Indianapolis Power & Light Company serve?

A Mainly the County of Marion and approximately one mile to the contiguous county roads in the contiguous counties.

Q Indianapolis is located in Marion County?

A In Marion County, yes. It is located in the center of Marion County, which is the capital of the State.

Q What is the approximate total electrical generating capacity of Indianapolis Power & Light?

A Well, currently it is about 1,103,000, but we are putting in a 450 unit at Petersburg, Indiana, now.

It was scheduled to be in on May 1 of this year, but it looks now like it might be in by, we are hoping, no later than October 1 of this year.

Another 450 megawatt machine has been placed on order and we are under construction now. That will be installed prior to May 1, 1973.

That will give us approximately 1,925,000 kilowatts of capacity generation.

Q What is the primary fuel source used by [6] Indianapolis Power & Light at its electrical generating facilities?

A Coal is the primary fuel.

Q Do you have any other fuels that you use?

A We use some gas and we use some oil. We have some diesels for start-up, which we just installed in the past two years, and then we also have oil for starting our boilers, and also in cases when we bring the boiler down, so that there is no question of the instability of the boiler coming on down, so we do throw the oil in just to bring the boiler on down to the point where we can take the turbines off the line.

Q You said you had purchased some diesel power generators in the last couple of years. How many of those have you purchased?

A There are five.

Q Where does Indianapolis Power & Light Company secure its coal?

A From the southern fields in Indiana and some of the western fields there to the south of Terre Haute.

There are a couple of mines over there at Brazil, south and east of Terre Haute.

[7] Q Has Indianapolis Power and Light ever purchased coal from mines located in Illinois?

A Not to my knowledge; not since 1926, since I have been here.

Q Why has Indianapolis Power & Light confined its purchases of coal to Indiana?

A Well, the coal fields are here, we are centrally located, and with the distance that the coal fields are to our plants, it is just economical that we buy it from the fields adjoining us.

Q What is the economic factor which leads to that?

A It is a question of freight. It is quite expensive to haul this coal from the various mines, and naturally, the closer the mines to your so-called power production plants, the cheaper the freight rate and the less costly it is from the standpoint of operation.

Q Have you ever considered the possibility of purchasing coal from such areas as Fulton County or Belleville, Illinois?

A No, sir.

Q Why wouldn't you consider that?

A I think it is too far away. We have [8] never purchased Illinois coal, and I think the cost of transporting the coal from those fields here would just be prohibitive.

Q Does Indianapolis Power & Light require that the coal which it purchases meet certain specifications?

A Oh, yes. It has to be a certain BTU quality, and also as far as the moisture is concerned, the ash content, the fusion temperatures and the grindability.

All of those factors are taken into consideration in the purchase of coal, particularly when you design a new plant and get your coal supply for it.

Q Does the type of coal which you use vary from facility to facility?

A Oh, yes. Some of it is raw, some of it is washed, some of it has different BTU content and different grindability factors.

Q Are there any situations where coal used at one facility would not be acceptable for use at another facility?

A Yes. At our Petersburg plant, that plant was designed and constructed to use strictly raw [9] coal. We do burn washed coal in it now.

However, at the other plants in Indianapolis, and that includes our Stout plant and even our Pritchard plant and our C. C. Perry plant, sections K and W, those have to have washed coal. They are not designed to burn raw coal.

Q Would there be any situations where different types of equipment within a single plant would require different types of coal?

A Yes. At our Perry plant we have some boilers that have what we call powdered mill zone that burn powdered fuel, while we have other boilers that are chain grate stokers, so those are two different types of fuels that we use there, or we get a fuel that is comparable, that we can use in both.

Q In determining what fuel to burn at your various facilities, does Indianapolis Power & Light consider alternatives to coal?

A Yes. Just recently the Gas Company wanted to know if we would be interested in coal, but the price they wanted to make us per million BTU was entirely too high.

Q Excuse me.

[10] A Yes.

Q You said that the Gas Company was interested in determining if you wanted to use coal?

A No. Yes. I am sorry.

Q All right.

A They wanted to know if we were interested in using gas, and the price they offered per million BTU was in excess of what we are paying now.

As far as oil is concerned, oil is more costly than coal in our operation. We have checked nuclear, we have watched it and we are interested in it, but there again the cost of nuclear, including the fuel as well as the cost of the facilities themselves, is greater than fossil fuels, as far as we are concerned at this point.

Q Is Indianapolis Power & Light participating in any programs designed to improve the economic attractiveness of alternative fuels in the future?

A Yes. We are a member of the Edison Electric Institute and we are taking part in their research program with respect to nuclear.

We also belong to the Atomic Power Development Forum. We were part of the contributors and interested in the engineering for the plant that [11] went up in Michigan. That is the A.P.D.A. plant.

We are interested in an organization called the East Central Nuclear Group, and we have studied magnetohydrodynamics, we have studied gas cool, and currently we are in a research program now with, I think, Gulf Atomics on the West Coast with respect to a fast breeder using gas as the coolant.

Q Have you personally participated in some of the activities of these various forums?

A I have attended some forums. I just attended one, the Edison Electric Institute national convention at Portland, Oregon, two weeks ago, and Dr. Seaborg was there, and he gave us a talk with respect to the future of atomic energy development, and indicated at that time that he felt that by 1980 atomic energy would be the source of generation for at least the base load of the electric utility industry.

Q Was this in the midwest?

A No. I think that was nationally. He was speaking from the national viewpoint.

Q I see. Does Indianapolis Power & Light purchase the coal which it uses pursuant to long- [12] term contracts?

A Yes.

Q Of how long duration are those contracts?

A Well, our longest contract is with Peabody Coal at this moment, and the base contract is for 30,000,000 tons.

However, the value of that contract, from a tonnage viewpoint, is equal, pretty close, to between fifty and fifty-five million tons, and that is normally, I would say, a thirty to thirty-five year coal supply.

Q Do you require that producers have this capability in entering into contracts with you?

A Yes. When you put these large units in, you have to be able to assure the coal supply for it, and normally you do not try to get it for less than thirty years from the standpoint of the supply.

Q Does Indianapolis Power & Light own any coal reserves of its own?

A Yes. We have some coal reserves in Pike and Gibson counties.

That is deep vein coal, so it would have to be mined by the underground mining system and not by strip mining.

[13] Q When were these acquired?

A Oh, I would say sometime in the mid-1930's.

Q Approximately how many tons would you estimate?

A Well, the geologists, on the survey that was made, indicated that there were approximately 30,000,000 tons of coal.

Q Do you have any plans to mine this coal?

A No, not at this time.

Q Would you be able to mine the coal yourself?

A No. If we wanted to open up that field for our own consumption, I think we would ask somebody who is in the underground mining operations to give us a quotation. We do not have the technology to operate and mine coal.

Q Does the electricity generated by Indianapolis Power & Light compete with other fuels such as oil and gas at the consumer level?

A Oh, yes. As far as gas is concerned, that is one of our strongest competitors, first of all, in home heating

for the wintertime, whereas we are selling all-electric living, and even in the [14] summertime they have gone to gas absorption units, and we have the same thing as far as the oil companies are concerned with respect to oil heating in the wintertime.

The Gas Company here is a non-profit organization and their gas rates here are a little lower than they are in other parts of the country. By virtue of that fact, they are very much a competitor of ours. It really is a charitable trust for the benefit of all the citizens of Indianapolis, is what it is.

Q Is that by choice or by circumstance?

A This is by circumstance, back in the 1930's, during the depression, when the bondholders got together and finally decided to put several gas companies together here.

Q Are fuel costs a major item of expenditure for electric utilities?

A Yes. I would say our fuel is running pretty close to 18 or 19 per cent of our total gross revenue dollar.

Q As compared to other expenditures, how does it stack up?

A Taxes are No. 1, and then labor. The [15] three major parts of our cost of operation are fuel, labor and taxes.

Q Is air pollution a matter of concern to Indianapolis Power & Light?

A Yes. It has been. We have been involved in air pollution since 1937, when we installed the first dust collectors at our plants.

Last year we spent right at a million dollars installing additional and new types of dust collectors at our plants.

Q What about sulfur dioxide?

A Well, at the present time, as far as sulfur dioxide, we have not found any system which would help alleviate the situation.

I think Monsanto is working on one. I know that Combustion Engineering are working on a scrubbing deal with Union Electric, and they are having problems in the operation of that; it has not been a hundred per

cent successful, and I think it is still in the experimental stage.

Now, whether somebody will develop something to assist in the alleviation of the sulfur dioxide from the gas, I do not know.

Q Is it possible that air pollution restric- [16] tions might affect your fuel buying pattern in the future?

A Yes. If they prohibit the use of sulfur coal, as I have seen some comment in various articles, less than 1 per cent sulfur coal, I do not think we have any less than 1 per cent sulfur coal in Indiana, and I do not know where less than 1 per cent sulfur coal is in this country, really.

Q Has the advent of the unit train benefited Indianapolis Power & Light in its coal purchases?

A Yes. The volume rate or unit train rate has permitted a reduction in costs as far as transportation is concerned.

Q Where unit trains are available to two mines and two different distances from one of Indianapolis Power & Light's facilities, will the unit train be of any competitive advantage to the more distant mine in helping to serve your business?

A No. I think it is all relative. I mean, as far as the unit train is concerned, the cost for the short distance would be just as much smaller as [17] the mine which was the farthest distance would have to be greater.

I think it is pretty much of a washout as far as the economics are concerned between them, if you have unit trains for both.

Q How would you characterize the degree of competition at the present time within the coal industry for your business?

A Well, I think it is quite active. I think we have as much competition today for our coal supply as we ever had.

Q Has the fact that both United Electric and Freeman been controlled by General Dynamics had any adverse effect on Indianapolis Power & Light?

A Not to my knowledge, no, sir.

Q Why would that be?

A Well, they are not within our area which we consider as economically feasible for the purchase of coal.

Q Will there be any adverse effect on Indianapolis Power & Light Company if General Dynamics is allowed to continue owning both Freeman and UEC?

[18] A No.

Q Would there be any benefit to Indianapolis Power & Light by forcing Freeman and United Electric to operate independently of each other?

A Not as far as we are concerned, no.

MR. KEMPF: I have no further questions.

MR. FUTTERMAN: May we have a short recess, please.

(Whereupon a short recess was taken, after which the taking of the deposition was resumed as follows:)

MR. FUTTERMAN: On the record.

CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mr. Schotters, what percentage of the fuel used to generate electricity in your system is coal?

A I would say 98½ or 99 per cent. The only reason we use oil at all is just to start the boilers off. If you bring the boiler up, you bring it up with oil rather than a powdered fuel, and without a flameout, and once you get a good fire in your boiler, then your oil goes out.

* * * *

[26] Q Mr. Schotters, you have no knowledge, [27] do you, of where United Electric or Freeman might locate a mine at some future date?

A No, sir.

Q And you would not know whether or not in the future either of those companies might locate a mine which would be in a position to serve one of your plants?

A I do not.

Q Mr. Schotters, you testified on direct examination, I believe, that you were in the Coal Purchasing Department of Indianapolis Power & Light.

A In the Purchasing Department, which bought all the supplies of coal.

Q When you were holding that position, did the suppliers of coal call on you and propose to sell coal to your company?

A Right.

Q Did you have knowledge of the types of mines that they were operating at that time?

A Yes.

Q In regard to strip mines, did you have a knowledge as to the depth at which the companies were stripping?

[28] A I would say forty to fifty feet overburden was perhaps the tops that they were removing at that time.

Q Was this in the 1930's?

A Back in the 1930's.

Q The '30's and '40's?

A And late '20's.

Q Was there any reason to believe at that time that stripping would exceed forty or fifty feet?

MR. KEMPF: I am going to object at this point to this line of inquiry as beyond the scope of the direct examination.

MR. FUTTERMAN: You may answer the question.

THE WITNESS: Would you repeat the question for me, please?

MR. FUTTERMAN: Read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A I would say no, to start with. However, due to the advent of World War II and the ability of not only the Government, but also of manufac- [29] turers in general to increase the size of equipment, this brought about the ability of this large earthmoving equipment, and this is when they started to develop a larger size equipment for the coal mining industry.

BY MR. FUTTERMAN:

Q Is it not a fact that stripping occurs at depths in excess of 100 feet in the midwest today?

A In the midwest, I cannot answer. In Indiana, I would say 110 feet is tops, maximum?

Q Mr. Schotters, would you tell us what the major factors are when you consider where to locate a coal generating station?

A The major factors are water and coal supply as well as the ability to transmit the power generated to the center of your load system.

Q Is it not true that high voltage transmission lines have reduced transmission costs?

A Yes.

Q Assuming proper load capacity going across these lines, is it more economical to have these extra high voltage lines?

A Yes.

[30] Q Has the development of high voltage transmission enabled you to consider plant locations previously thought to be too far from distribution centers?

A The answer to that is really no, for the simple reason that at the time we were installing our Stout plant, as well as our Petersburg plant, our load growth or our demand had not exceeded the point where we could not transmit it with 138,000 volt transmission lines, but as the load continues to grow, you naturally have to be able to develop your lines, and you are able to go into larger units, from a 100 MW unit to a 250 MW unit and now to a 450 MW unit, so naturally it behooves us to get closer to the coal fields, as far as water is concerned, and then the question of the transmission, and we are transmitting now 345,000 volts.

Q Mr. Schotters, in the future, if you are to locate your plants away from the municipal areas within your distributing area, wouldn't that alleviate certain municipal air pollution problems?

A No. Air pollution will be, I am quite sure, a state statute or a federal regulation, regardless of where you put it. You can put it [31] in Timbuktu.

Q Is it not a fact, Mr. Schotters, that the air pollution legislation will be concerned with the quality of the air?

A Yes.

Q And is it not a fact that the quality of the air in outlying areas is likely to be better than the quality of the air in municipal areas?

A I think the regulations are going to provide that these test spots will be made within a certain location from the plant site, and regardless of the purity of the air, they are going to hold you within certain restrictions as to the amount of gas as well as contaminants that come from the top of that stack.

Q Mr. Schotters, do you know this for a fact?

A Yes. I think I read a report with respect to the rules and regulations that are being adopted in Chicago.

Q Have any of these regulations been adopted in the State of Indiana?

A Have they?

* * * *

[34] BY MR. FUTTERMAN:

Q Mr. Schotters, is it not a fact that the presence of coal deposits in Illinois and West Kentucky serves as a restraint on the prices that Indiana coal producers can charge electric utilities in Indiana?

A I do not think so.

Q Well, is it not true that if the price of coal in Indiana were raised to certain levels that it might enable you to begin purchasing coal more economically from producers in Illinois of West Kentucky?

A You have a freight problem here and I think your cost of transportation would more than offset any reduction in price which they could make.

Q Well, would the freight cost from eastern Illinois, if coal were available in that part of the state, be much greater than the freight cost from the western coal fields of Indiana?

[35] A I would say the single car tariff would be 25 to 30 per cent higher.

* * * *

[39] REDIRECT EXAMINATION

BY MR. KEMPF:

Q During your cross examination by Mr. Futterman, you stated that approximately 98 per cent or more of your fuel requirements are supplied by coal at the present time.

A Yes.

Q In making your fuel procurement decisions, do you continue to compare the costs of alternative fuels such as gas, oil and nuclear?

A Yes.

Q Will you continue to do so in the future?

A Yes. That decision must be made before you really determine whether you are going to go into a fossil fired fuel generating station.

Q Mr. Futterman also asked you some hypothetical questions based on certain assumptions concerning coal reserves.

Do you know whether there are any fields of strip reserves not controlled by present producers and which are recoverable at or near present mining costs, which are available for acquisition at [40] the present time?

A No. I do not know of any.

Q Do you know it to be a fact that there are no such fields available?

A Well, I would say this: If they are, they have not been located, so they are not a field at this time. All the fields of recoverable reserves in the State of Indiana are all now designated and located.

Q Have you ever operated a strip mine, Mr. Schotters?

A No.

Q Do you consider yourself an expert in strip mining technology?

A No.

MR. KEMPF: I have no further questions.

RECROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mr. Schotters, you stated that all recoverable fields in Indiana are located. Do you mean strip reserves or underground reserves or both?

A I would say both, to the best of my knowledge.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF LEROY M. ABRAHAMSON, TAKEN JUNE 26, 1969

* * * *

MR. HEDLUND: Will you swear Mr. Abrahamson, please, Mr. Youker.

(The witness was thereupon duly sworn.)

MR. HEDLUND: Mr. Abrahamson, in the event I ask you a question which you do not understand, or Mr. Cusack asks you a question which you do not understand, please feel free to say that so that we can rephrase it and make it more meaningful.

Also, if during my questioning or that of Mr. Cusack I inadvertantly interrupt you in an answer that you have not finished, please bring that to our attention so that we can get a full and complete answer from you.

LEROY M. ABRAHAMSON,

called as a witness by the defendants herein, having been by me, the said Claude W. Youker, Jr., as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name and present occupation.

A Leroy M. Abrahamson, Manager of Power [4] Production, Wisconsin Power & Light Company.

Q Are you appearing at this deposition pursuant to a subpoena served upon you?

A Yes, I am.

Q Could you briefly describe your educational and business background.

A I graduated from the University of Minnesota with the degree of Bachelor of Electrical Engineering in June of 1929.

I have worked for the Wisconsin Power & Light Company since October of 1929, in various capacities, from power plant electrician to manager of two different power plants. For the past sixteen years I have occupied my present position.

Q Could you tell us generally what your responsibilities are as Power Production Manager?

A The Power Production Department has supervision over the design, the construction, the operation and the maintenance of all of the company's power plants, including the hydro plants as well as the steam plants.

Q To what extent have you, in recent years, been involved in coal purchasing, negotiations for coal contracts and the administration of those [5] contracts?

A For the past sixteen years I have helped negotiate every coal contract.

Q That is, every coal contract of Wisconsin Power & Light Company?

A Yes, in conjunction, of course, with our Purchasing Department.

Q Could you please describe the service area of Wisconsin Power & Light Company?

A We serve the South Central portion of Wisconsin, from the Illinois state line up north as far as Tomah and Clintonville in Wisconsin.

We serve Sheboygan on Lake Michigan, over to the Mississippi River, the area over to the Mississippi River.

Q Is it fair to say that Wisconsin Power & Light serves approximately one-third of the geographic area of the State of Wisconsin?

A We serve about one-third of the area. We do not, of course, serve one-third of the population—

Q I understand.

A —because of Milwaukee, and so forth.

Q How does Wisconsin Power & Light rank [6] among the utilities in Wisconsin in total generating capacity?

A We are the second largest.

Q Is Wisconsin Power & Light an investor-owned utility?

A Yes, it is.

Q I wonder if you could describe the generating facilities of Wisconsin Power & Light, and as to those that consume coal, from whom coal is purchased for those stations. Perhaps it would be easier to start with your Edgewater plant.

A Well, at Edgewater station we have an installed capacity of about 130 megawatts. That capacity is in three units.

Coal for Edgewater is purchased from the C. Reiss Coal Company.

Q Do you know where—I am sorry.

A The coal comes from Peabody Coal Company.

Q All right.

A We burn practically all West Kentucky, either No. 9 or No. 11 coal, except that last year he had to burn some eastern coal because of the Belt Line Railroad strike in Chicago.

[7] Q Had you ever burned eastern coal before?

A Yes, sir. Up until about fifteen years ago we burned all eastern coal at that station.

Q Where is the Edgewater plant located?

A It is located on the south side of the city of Sheboygan.

Q Sheboygan is located on the western shore of Lake Michigan?

A That is correct.

Q With reference to the coal that you purchased for Edgewater, how is that coal delivered?

A The coal comes from the mines in West Kentucky through the Rail-to-Water facility in Chicago. It is dumped in boats, hauled to the C. Reiss dock, and then it is trucked out to Edgewater as we consume it.

Q Are your contracts for the purchase of that coal directly with C. Reiss Coal Company?

A Yes, they are. They are one-year contracts.

Q Why do you purchase your coal directly from C. Reiss Coal Company rather than, say, directly from a producer?

A C. Reiss Coal Company have room on their [8] dock to store this coal. They own the coal until it is delivered to our plant.

Q Approximately how many tons of coal a year do the three units at Edgewater consume?

A Approximately 275,000 tons a year.

Q Why have you confined your purchases at Edgewater in the past to coal from West Kentucky, or to use the recent example, to coal produced in the eastern section of the country?

A The older units at Edgewater, the first of which was installed in 1931, were designed for high BTU coal out of the east. With the lower BTU coal we could not get full capacity out of these units.

Q Is West Kentucky coal, or the West Kentucky coal which you are consuming there, a high BTU coal?

A It is high BTU compared with Belleville or Fulton County coal.

Q You have under consideration, do you not, at Edgewater, a new generating facility?

A Yes. We are presently constructing a 330 megawatt coal-fired unit.

Q When that construction is completed and the plant is on line, will you continue to use the [9] existing units at Edgewater?

A They will continue to be used but to a lesser extent than they are being used today.

Q Is it likely that at some near future time these units will be closed?

A The two 30 megawatt units will be the first to be retired in our company.

Q Of all your generating stations, how does Edgewater presently rank in terms of fuel costs?

A Edgewater has the highest fuel cost of any of our stations.

Q Could you briefly describe, or generally describe your generating station which is called, I believe, Nelson Dewey?

A Nelson Dewey Station is located on the Mississippi River at Cassville, Wisconsin. It has two units and a total capacity of 220 megawatts.

Q Does this plant consume coal?

A The plant does consume coal. It come from the Belleville District of Illinois, some 640,000 tons per year.

It is loaded in barges at either East St. Louis of the Kellogg dock in Illinois, barged [10] up to Cassville, and there we unload it to our own pile. We have no facilities for receiving rail coal at this plant.

Q Is the coal for Nelson Dewey purchased on an annual basis such as at Edgewater, or on long-term contracts?

A Coal for Nelson Dewey is purchased on long-term contracts. We have three suppliers there. As to two of the suppliers, the contract extends until 1976, and with respect to the other supplier, until 1978.

Q Through the year 1976, then, what per cent of your long-term coal contract commitments have you completed? That is, what per cent of your long-term contract coal commitments through the year 1976 have been satisfied?

A I don't understand the question.

MR. HEDLUND: Let me try to rephrase it, then.

BY MR. HEDLUND:

Q Is it not a fact that you have entered into contracts for all of your long-term contract coal commitments for Nelson Dewey through the year 1976?

[11] A That is true.

Q With respect to the two contracts you mentioned that run through the year 1976, do you have an option to renew either of those contracts?

A Yes. We have an option to renew one of them for ten years.

Q Why have you not purchased coal for Nelson Dewey from mines located other than in the Belleville District?

A All of our studies have shown that it is more economical to use Belleville District coal.

Q Could you describe the other two coal burning stations that you presently operate?

A About five miles north of Beloit, located on the Rock River, we have our Rock River generating station. It is a two-unit plant with a total capacity of 160 megawatts. All of the—

Q Approximately—I am sorry. Continue.

A All of the coal for Rock River is all rail from the mine to the plant. We normally would burn only West Kentucky or Southern Illinois coal, because of its higher BTU rating.

In the past year, with coal in short supply, [12] we have burned some coal from the Belleville District and some from Wilmington, and some from Fulton County.

Q Has that coal been supplied from mines owned by the companies with whom you had contracted for West Kentucky or Southern Illinois coal?

A Most of the coal comes from the Peabody Coal Company with whom we have a long-term contract. We have made yearly contracts with two other suppliers.

Our Black Hawk Station is located in the city of Beloit, also on the Rock River. This is all rail coal again, normally from West Kentucky.

However, at this station we do have one boiler in which we burn interruptible gas. In 1968, 57 per cent of the production at Black Hawk was by gas and the balance was coal. The size of the station is 58 megawatts.

Q That is in Beloit, is it?

A Right in the city of Beloit, yes.

Q Do you have any present plans for increasing your gas consumption at Black Hawk?

A Yes. At the present time we are installing gas burners in the second boiler at Beloit.

Q When the conversion is completed, approxi- [13] mately what per cent of the electrical generation at Black Hawk will be gas—let me rephrase that question.

When this conversion is completed, what per cent of the fuel consumed at Black Hawk will be natural gas?

A It will be approximately 80 to 85 per cent gas.

Q Could you tell me some of the factors that entered into the decision by Wisconsin Power & Light to convert the remaining units at Black Hawk to natural gas?

A We are a combination company, that is, we sell both electricity and gas. Our gas loads have been increasing steadily, and as a result we have had to buy larger quantities of gas; we had to contract for a larger demand.

We use that for our customers during the cold months

and burn a portion of the remaining gas for generating electricity.

Q Are there any other factors involved in your decision to convert the remaining unit?

A Yes. It was more economical to burn the gas.

[14] Q Was air pollution considerations a factor?

A Yes. We are directly across the street from Beloit College.

Q Have they been giving you a lot of problems with respect to air pollution?

A No, they have not.

Q Not yet?

A No.

Q Do you operate any hydroelectric plants in the system?

A Yes. We own and operate two hydroelectric plants, a 30 megawatt plant on the Wisconsin River at Prairie Du Sac and a 10 megawatt plant at Wisconsin Dells.

In addition to this, we are part owners of the Wisconsin River Power Company, who operate the Castle Rock and Pettenwell plants, and we receive 12 megawatts of power from those two plants.

Q You have mentioned, now, Edgewater, Nelson Dewey, Black Hawk, Rock River and your hydroelectric plants. Do you have any other generating facilities presently being operated?

A Yes, we do. We have two gas-fired turbine generator peaking units. One of these is located [15] directly at the Rock River plant, and is a nominal 30 megawatt unit.

The second gas turbine is located about a mile from Rock River, and that is a nominal 17 megawatt unit.

Q I wish to return for one moment to the Rock River plant. Approximately what per cent of the coal burned at that plant is pursuant to the one long-term contract that you mentioned? Can you give it to me just roughly?

A I would have to answer that in two ways. For the coming year we are burning somewhat less coal under the long-term contract. It will be about 60 per cent under the long-term contract for the year 1969.

Q In prior years, approximately what per cent was it?

A In prior years it was closer to 90 per cent.

Q Do you expect that your 60 per cent level will be maintained over the next several years, or do you know?

A I do not know.

Q How long is the term of that contract?

[16] A Until 1976.

Q How long in duration will that contract then have been in effect?

A Twenty years.

Q Do you presently have under construction any new generating capacity?

A As I mentioned before, we are installing a 330 megawatt unit at Edgewater. This is a coal-fired unit. It is scheduled for completion by December of 1969.

Q How will that unit compare to other generating facilities in the State of Wisconsin when completed?

A It will be the largest unit in the State of Wisconsin. Coal for the unit will be supplied by unit train. Originally the coal will come from Fulton County, from one coal supplier and over one railroad. The Wisconsin Power & Light Company and the Wisconsin Public Service Corporation will own the coal cars.

Edgewater Unit No. 4 will be owned 31.8 per cent by Wisconsin Public Service Corporation.

MR. CUSACK: And the remainder by your [17] company, do you mean?

BY THE WITNESS:

A And the balance by Wisconsin Power & Light Company.

MR. CUSACK: Thank you.

BY MR. HEDLUND:

Q With whom was the coal contract for this plant negotiated?

A The Peabody Coal Company.

Q Were you directly involved in those negotiations?

A Yes, I was.

Q Did you have ultimate responsibility for that contract?

A (No answer.)

Q I am talking about ultimate working responsibility. Undoubtedly board approval or top executive approval, chief executive approval, may have been necessary, but were you the principal?

A There were two of us that were involved, the Manager of Purchases and Stores and myself.

Q The Manager of Purchases and Stores of Wisconsin Power & Light Company?

A Of Wisconsin Power & Light Company, yes.

[18] Q Who will own the cars used in that unit train?

A They will be owned jointly by Wisconsin Power & Light Company and Wisconsin Public Service Corporation.

Q Approximately how much is each one of those cars going to cost?

A Each car will cost just over $16,000.

Q Why did you decide to purchase coal for this new plant under one single contract?

A Because of the tonnage involved and the equipment that is necessary at the mine, it would be practically impossible to have more than one supplier.

Q Having one supplier, did this give you any advantage as far as transportation costs are concerned?

A Very definitely.

Q Why was that?

A Because this unit train will make better utilization of the coal cars and engines that pull the train than would be the normal railroad service.

Q I did not ask you what the term of this contract is.

[19] A This contract is for fifteen years with a ten year option.

Q Beyond the fifteen?

A Beyond the fifteen.

Q Up to how many tons of coal per year will be shipped under this contract?

A Up to 1,000,000 tons of coal.

Q In planning for the coal supply for this generating station did you give consideration to the United Electric Coal Companies as a supplier?

A No, we did not, mainly because they did not convince us that they had adequate reserves. We did give consideration to many coal companies.

Q Speaking in terms of reserves, what was the total amount of reserves or of a reserve commitment that you were looking for?

A We were looking for around 25,000,000 tons.

Q Do you have any other generating facilities presently under construction?

A Yes. Together with Wisconsin Public Service Corporation and Madison Gas & Electric, we are constructing a 527 megawatt generating unit at Kewaunee, Wisconsin. This will be a [20] nuclear station.

Q Approximately when do you expect that plant to be completed?

A That plant should be completed late in 1972. We will own 41 per cent of the plant.

MR. HEDLUND: Mr. Youker, will you mark as Abrahamson Deposition Exhibits 1 and 1-A the front cover and its back page of the 1967 Annual Report of Wisconsin Power & Light Company, and having done so, would you hand it to the witness, and for purposes of minimizing the number of documents in this case, I am physically going to remove this cover page.

MR. CUSACK: May I see the exhibit, please?

MR. HEDLUND: Certainly.

(The front and back sides of the document were thereupon marked respectively Abrahamson Deposition Exhibits 1 and 1-A, for identification 6-26-69.)

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

[21] MR. CUSACK: Mr. Hedlund, will you furnish us with a copy of this, as we do not have a copy of it and have not seen it before.

MR. HEDLUND: I do not intend to ask Mr. Abrahamson anything other than the following question with respect to this document:

BY MR. HEDLUND:

Q Is that document the document that I have described?

A Yes, it is.

MR. HEDLUND: Let the record show that I am giving the original copy of the exhibit to Mr. Cusack so that he can make a copy.

MR. CUSACK: Very well.

BY MR. HEDLUND:

Q Mr. Abrahamson, does Wisconsin Power & Light have under consideration at the present time the construction of any additional generating capacity?

A Yes. We now have a study under way looking toward the construction of about a 500 megawatt station to be in operation early in 1975.

The decision has not been made as to [22] whether this will be a fossil fuel or a nuclear station, although it tends toward the fossil fuel.

Q In that connection, Mr. Carl J. Forsberg—who is, is he not, Chairman of the Board of Wisconsin Power & Light Company?

A That is correct.

Q (Continuing) —testified before the Interstate Commerce Commission in Finance Dockets Nos. 24182, et al., being a proceeding involving the proposed merger of the Chicago, Milwaukee & St. Paul Railroad with the Chicago and North Western Railway, and I am informed made the following statement:

> "The economy of rail transportation in turn will have a further direct relationship upon our future decision to utilize coal in the use of steam generation as against nuclear generation."

Whether or not Mr. Forsberg did actually so testify, would you agree with that statement?

A I would agree with that statement.

Q Now, with respect to this additional generating capacity that you have under study, have you had any conversations with coal suppliers with [23] respect to

supplying coal to the station if you ultimately decided that it is to be coal-fired?

A Yes. We have had preliminary reports from five or six coal suppliers.

Q What sort of contractual commitment have you indicated to these suppliers that you have in mind?

A We have indicated to these suppliers that we would like to have a twenty year contract with two five-year additional options to renew.

Q What would be the approximate tonnage per year under this contract?

A For the first five years it would be about a million and a half tons. When it is decided to install the second unit, use would increase to approximately three million tons per year.

Q How would you contemplate receiving this coal?

A By unit train.

Q Do you contemplate entering into a contract with just one producer?

A That is our present thinking.

Q In the course of these preliminary dis- [24] cussions with coal suppliers, did you have any discussion with United Electric Coal Companies, or a representative of the United Electroal Coal Companies?

A Yes, we did. In fact, we received a proposal from Ed Butler of the United Electric Coal Companies.

Q What position does Mr. Butler have with United Electric Coal Companies?

A He is the salesman who calls on our company.

Q Could you tell us about the proposal made to you by Mr. Butler? By the way, when was this proposal?

A In December of 1968.

Q I am sorry to have interrupted. Could you tell us of the proposal by Mr. Butler?

A The proposal, which was rather preliminary, was that he proposed to sell us coal from the Springfield District of Illinois, from property presently owned by the Freeman Coal Mining Company.

Q Was that to be out of an existing mine or a new mine?

A That would be from a new underground mine.

[25] Q What was your reaction to this proposal?

A We looked upon it favorably.

Q Are you at the same time still considering proposals from other companies?

A Very definitely.

Q Was there any transportation aspect of Mr. Butler's proposal that was of interest?

A Yes. The fact that this coal mine could be located on the Chicago and North Western Railroad and one of the two plant sites that we have is on the Chicago and North Western Railroad would make it a one-line haul, and that would make it definitely attractive to us.

The other site that we have is on the Milwaukee Road. With the proposed merger of the two railroads, it would again make it a one-railroad haul.

Q Did any of the other coal producers with whom you had these preliminary discussions indicate an ability or willingness to open up a new strip mine to provide this tonnage?

A No one offered us coal from a strip mine.

Q In considering Mr. Butler's proposal, were you troubled at all by United Electric's lack of [26] experience in deep mining?

MR. CUSACK: Objection. It is a leading question. I move to strike.

MR. HEDLUND: You may answer.

BY THE WITNESS:

A In my personal opinion—would you repeat the question, please?

MR. HEDLUND: Will you read the question, please, Mr. Youker.

Q (Read by the Reporter.)

MR. CUSACK: I would like to point out for the record that Mr. Butler's proposal, according to the witness' testimony, was about a Freeman mine. He said nothing about a United Electric mine.

MR. HEDLUND: Mr. Abrahamson talked about Freeman property. You may answer, now, if you understand the question.

BY THE WITNESS:

A No. I was not concerned.

BY MR. HEDLUND:

Q Why was that?

A Because Freeman operates underground mines.

[27] Q If United Electric were independent and came to you with a proposal to open a deep mine in order to serve this facility under the contract that you have in mind and it were the fact that United Electric did not at that time nor had it in the past any deep mining experience or know-how or organization, would that have been of concern to you?

A Personally it would be of concern to me and I would investigate very thoroughly their ability to operate this mine before advising our company to enter into a contract with United Electric.

Q Why would you investigate their ability to open a deep mine? Why is that a consideration?

A Because United Electric has mainly been—has always been a strip mining company.

Q Can you tell me, Mr. Abrahamson, at the present time what per cent of your generating capacity is coal-fired, what percentage natural gas and what percentage hydroelectric?

A Let us use the kilowatt hour requirements for the year 1968.

Q All right.

A 89 per cent of the electricity was produced [28] by coal, 5 per cent by gas and 6 per cent by hydro. I may have the 5 and 6 reversed.

MR. CUSACK: No, you don't.

THE WITNESS: All right.

BY MR. HEDLUND:

Q Upon completion of the Kewaunee station, what per cent of your generating capacity, approximately, will be coal?

A Approximately 80 per cent.

Q Do you believe that coal competes with other fuels in the utility market, or other sources of energy?

A Very definitely. That is why we are studying the proposition now, should the new station be nuclear or coal-fired.

Q In your opinion, Mr. Abrahamson, based upon your experience and knowledge, has the common ownership of Freeman and United Electric had any adverse effect on Wisconsin Power & Light?

A In my opinion, no, it has not.

Q In your opinion, would there be any benefit to Wisconsin Power & Light if General Dynamics were divested of its ownership of United Electric?

[29] A No, not in my opinion.

MR. HEDLUND: May I have the last question and answer again, please, Mr. Youker.

(The record was thereupon read by the Reporter as above recorded.)

BY MR. HEDLUND:

Q In your opinion, might there be a benefit to Wisconsin Power & Light if the common ownership of these two companies were permitted to continue?

A It could be a benefit to Wiscon Power & Light if we would sign a contract for coal from the Springfield property.

MR. HEDLUND: You may inquire, Mr. Cusack.

CROSS EXAMINATION

BY MR. CUSACK:

Q Mr. Abrahamson, in regard to your Edgewater Generating plant, you said, did you not, that at one time all of the coal purchased for the Edgewater plant was eastern coal? Is that correct?

A That is correct.

Q When was the last year that all the coal purchased for Edgewater was eastern coal?

A It was approximately fifteen years ago.

* * * *

[34] Q Did anyone at United Electric state to you [35] that he thought that you would be able to get some coal from the Banner mine?

MR. HEDLUND: It has been asked and answered. I object to it on that basis.

THE WITNESS: May I have the question back, please?

MR. CUSACK: Read the question, please, Mr. Youker.

Q (Read by the Reporter.)

BY THE WITNESS:

A No. No one committed themselves to supply us any coal from the Banner mine.

BY MR. CUSACK:

Q Is it still under investigation?

A Yes.

Q Mr. Abrahamson, can the Nelson Dewey plant use any other fuel, other than coal?

A No.

Q Is it a fair statement to say that only coal is competitive for your fuel requirements at Nelson Dewey?

A That is true.

Q Is it also fair to say that only coal is competitive for your fuel requirements at [36] Edgewater?

A Yes.

Q With respect to your Rock River generating station, sir, does this use coal solely?

A Yes, it does.

Q Is it fair to state that there are no other fuels which are competitive for the fuel requirements of your Rock River plant?

A At the present time no fuel is competitive with coal at Rock River.

Q Excuse me, sir, but I would like to go back to Nelson Dewey again. You have three suppliers at Nelson Dewey, do you not?

A Yes, we do.

Q You have United Electric and what other companies?

A Consolidation Coal Company and Peabody Coal Company.

Q You have one contract that expires in 1978, is that correct?

A Yes.

Q Whose contract is that?

A That is with United Electric.

* * * *

[38] For the past two years, with the shortage of coal, we have received coal from various mines in West Kentucky, Southern Illinois, the Belleville District—

Q And Fulton County?

A —And Fulton County.

Q With reference to the Black Hawk plant, sir, of Wisconsin Power & Light, this is the only plant, am I not correct, that uses any other fuel other than coal? Is that correct?

A That is true.

MR. HEDLUND: May I have the question and answer again, please, Mr. Youker.

(The record was thereupon read by the Reporter as above recorded.)

BY THE WITNESS:

A It is true except that we burn gas in our peaking units which I described previously.

MR. CUSACK: Yes.

BY MR. CUSACK:

Q Other than the peaking units?

A Yes.

Q Incidentally, could you explain how a [39] peaking unit operates? When does it operate? When do you use it?

A We should use these units only over our peak load periods. The 30 megawatt plant can be started and fully loaded in 30 minutes. The 17 megawatt plant can be started and fully loaded in less than five minutes.

Q In 1968, sir, how many days in the year did you use the 30 megawatt unit?

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY MR. CUSACK:

Q Just give us an approximation.

A We used it something like 2,000 hours, and I think it is on this sheet here (indicating).

Q 2,000 hours is fine.

The 30 megawatt unit was used about 2,000 hours and the 17 megawatt unit was used about how much, sir?

A That unit did not become commercially operational until December 30th, 1968, so it was only used for test purposes, maybe 10 hours.

* * * *

[43] Q In regard to this projected plant, sir, and whether or not it will be a fossil fuel plant or a nuclear plant, is it a fair statement to say that your company has had a bellyfull of nuclear [44] plants?

MR. HEDLUND: I am going to object to that, Mr. Cusack. You know how to phrase a question without indulging in invective.

BY THE WITNESS:

A We have had some problems and delays with the construction of the Kewaunee plant. That plant is not scheduled for operation until 1972, so we do not know if our problems are behind us or still ahead of us.

BY MR. CUSACK:

Q When I spoke to you this morning, sir, you did use the word "bellyfull" in regard to your new nuclear plant, did you not?

A Yes, I did.

Q That was your term, was it not?

A That was.

Q It is fair to say, is it not, that you have had some serious problems at the Kewaunee plant?

A Nothing that cannot be overcome.

Q What was the original cost estimate for the Kewaunee plant, sir?

A $83,000,000.

Q And how much as it going to cost?

[45] A We have applied to the Public Service Commission for $112,000,000.

Q Do you anticipate that it will cost more than $112,000,000?

A I am in no position to know.

Q Do you anticipate, sir, that the new generating station that you will complete by 1975 will in fact be a fossil fuel plant?

A The decision has not been announced, that it will be a fossil fuel plant.

In my own opinion, the chances are better that it will be a fossil fuel plant, than that it will be nuclear.

Q Sir, based upon your knowledge and experience generally, and with your company, is it your recommendation that this new plant be a fossil fuel plant?

A It would be my recommendation, yes, sir.

Q Why, sir, do you recommend that this plant be fossil fuel over nuclear? What are some of your general reasons?

A The delays that they have been having in all of the nuclear plants, lack of operating experience and the cost factor.

[46] Q Is it your opinion that the fossil fuel plant will be more economical than the nuclear plant?

A That is my opinion, yes.

Q Sir, when did you begin negotiations for the unit train contract, the long-term contract for the Edgewater plant?

A In the fall of 1966.

Q You stated that someone from United Electric contacted you at that time, to try and send you some coal, or try to enter into a coal contract to supply this plant?

A We are always talking with representatives from United Electric Coal Companies. To my knowledge, we did not receive a proposition from United Electric Coal Companies.

Q You stated on direct examination that United Electric did not convince you that they had adequate reserves to supply Edgewater. Is it a fact, sir, that in fact they did not bid to supply Edgewater?

A They did not give us a formal proposal, that is right.

Q Sir, for the new fossil fuel plant that [47] you plan to complete by 1975, will you enter—

MR. HEDLUND: I believe that carries with it an assumption that you have not established.

BY MR. CUSACK:

Q Assuming that your new generating plant to be completed in 1975 is a fossil fuel plant, will you be able to use coal for that plant from any of the mines located in Illinois?

A It will be designed for a specific coal, usually a lower BTU coal which enables us to burn coal from practically any mine in Illinois, that has the correct fusion temperature.

Q It is a fact, is it not, based upon your professional experience, that you can design a boiler and generating plant to take almost all coals mined in Illinois, is that correct?

A Yes, it is.

MR. HEDLUND: I object to that question as being misleading. I do not know if you are talking about that you can design it for any particular coal that is mined in Illinois, or design it so that it can burn each and every type of coal mined in Illinois.

[48] MR. CUSACK: Thank you.

BY MR. CUSACK:

Q Can you design a generating station at the present time so that it can take each and every coal mined in Illinois?

A No.

Q Do you have to design it for a particular coal?

A It can be a series of coals.

Q Can you design a generating unit that can take Fulton County coal and also Central Illinois coal?

A Yes.

Q Can you design a generating unit that can take Fulton County coal, Central Illinois coal, and Belleville coal?

MR. HEDLUND: Of course, again I think that question is misleading because, as Mr. Cusack is well aware, there are a variety of coals in Fulton County, there are a variety of coals in Central Illinois and there are a variety of coals in Belleville. I think the question is intentionally misleading.

MR. CUSACK: I think the witness can [49] answer the question and the Government suggests that counsel refrain from testifying. I repeat my question, sir:

BY MR. CUSACK:

Q Can you design a boiler at a fossil fuel generating station which can take Fulton County coal and Belleville coal?

A That can be done. However, I must state that some of the Belleville District coals vary and we cannot burn all Belleville District coals at our Nelson Dewey station.

We have Cyclone burners in our boilers over there and some of the Belleville District coal has too high a fusion temperature.

Q What Belleville coal can't you use at Nelson Dewey?

A We have had trouble with some of the Burn-Star mine's coal, coal from some of the Burning Star mines.

Q When you say, sir, that you have had trouble, does this mean that the plant does not operate at the efficiency you would desire?

A We could not get the slag, which is the molten ash, out of the boiler and approach within [50] an hour of the time that we were going to have to shut the unit down.

MR. HEDLUND: I would call that inefficient.

BY MR. CUSACK:

Q Now, you testified on direct examination, sir, that you talked with Mr. Edward Butler of United Electric, is that correct?

A That is right.

Q Mr. Butler called on you in December of 1968?

A Yes.

Q Where did he call on you? At your offices here in Madison?

A In the offices here, yes.

Q Had Mr. Butler called on you prior to this time?

A Yes, he had.

Q As a representative of United Electric?

A Correct.

Q In the course of your conversation with Mr. Butler, did he mention to you any coal reserves of United Electric at what is known as the Industry Field?

[51] A No.

Q Did he mention to you any coal reserves of United Electric at what is known as the North Canton Field?

A Not to my knowledge, no.

Q Did Mr. Butler mention to you any coal reserves of United Electric known as the Round Prairie Field?

A No.

Q Could you please tell us, sir, to the best of your recollection, exactly what your conversation was with Mr. Butler in regard to United Electric, not Freeman, but United Electric, being able to bid on supplying a new fossil fuel generating station?

MR. HEDLUND: If the witness is capable of answering that, or if it can be answered, if he can separate what he said about United Electric from what he said about Freeman.

BY THE WITNESS:

A I don't think I can recall too much of what he said about this field. The map he did show us and which showed the reserves had both United Electric and Freeman reserves on the same map.

[52] BY MR. CUSACK:

Q What did he say to you specifically regarding United Electric reserves?

A Over the years we have been told both by Ed Butler and by his predecessor that the reserves of United Electric Coal Companies were—that they did not have too many reserves.

Q Was his predecessor Mr. Thomas Tarzy?

A Right.

Q When were you first told by Mr. Tarzy that United Electric had insufficient reserves, in approximately what year?

A I just can't remember.

Q Would it be since 1960?

A I believe it would be since 1960, because United Electric used to sell us coal from the Ruby mine in West Kentucky and that ran out, and it probably was at about that time that they pointed out the lack of needed reserves.

Q When Mr. Tarzy or Mr. Butler talked to you regarding United Electric reserves, did they say at that time that Freeman had adequate reserves?

A No.

[53] Q Did they at that time try to sell you Freeman reserves in lieu of United Electric reserves?

MR. HEDLUND: Now, it is not clear to me what the time is that you are talking about. Do you mean the first time—

MR. CUSACK: At any time.

MR. HEDLUND: (Continuing)—or at any time since 1960?

MR. CUSACK: At any time since 1960.

MR. HEDLUND: He has already testified as to one mention made by Mr. Butler. Now, you are asking, was there ever any other mention? Is that what you are asking, Mr. Cusack, so I understand the question?

MR. CUSACK: That is right.

BY THE WITNESS:

A I think that the Freeman reserves were brought up in conversations within the last year or year and a half.

BY MR. CUSACK:

Q Now, Mr. Butler, when he came to talk to you—he is a United Electric employee, is he not?

[54] A That is right.

Q He attempted to sell you some Freeman reserves, is that correct, for this possible new fossil fuel generating station?

A This was a preliminary talk about a contract for the new generating station.

Q Was it your understanding, sir, that this proposal—would you call it a tentative proposal?

A Tentative.

Q Was it your understanding that this tentative proposal involved a mine to be operated by Freeman?

A It could have.

Q Did Mr. Butler indicate to you who would operate this new mine?

MR. HEDLUND: I think you are getting metaphysical, Mr. Cusack.

BY THE WITNESS:

A At the time he was talking to us, it was thought that both companies would be owned by General Dynamics.

• • • •

[61] Q That is an underground mine located in the Belleville Freight Rate District?

A Yes, it is.

MR. CUSACK: I have no further questions. Thank you, Mr. Abrahamson.

REDIRECT EXAMINATION

BY MR. HEDLUND:

Q Mr. Abrahamson, is it not true that for every kilowatt hour generated at your hydroelectric plants, you need to burn just that much less coal throughout your system?

A That is true.

Q Is it true that for every kilowatt hour at your peaking stations you have to burn just that much less coal or have just that much less coal burning capacity?

A Yes.

Q Is it not also true that for every kilowatt hour that will be generated by your Kewaunee nuclear station, that you will be required to burn just that much less an amount of coal?

A We will burn less coal because of the Kewaunee nuclear plant.

[62] Q In the light of that, then, while you have stated that coal does not compete with any other energy at Nelson Dewey because Nelson Dewey is not capable of burning any other fuel, is it not the case that coal competes directly, throughout your system, with all of the forms of energy that I have mentioned?

A Yes, it does.

Q You have referred, Mr. Abrahamson, to a shortage of coal at present. Have you encountered any shortage of coal being offered to you as part of the process of entering into long term coal contracts?

A No. We have encountered no difficulty at all.

Q You mentioned, I believe, with respect to Nelson Dewey, a tow line being brought in from Kewaunee, was that—not Kewaunee, but from Shawneetown?

A We are getting one tow at the present time from Shawneetown.

Q At Nelson Dewey you buy coal on a delivered basis, do you not?

A Yes.

• • • •

[18]

EXCERPTS FROM DEPOSITION OF GEORGE P. GAMBLE, TAKEN JUNE 27, 1969

* * * *

BY MR. FUTTERMAN:

Q What about in 1968?

A In 1968 there was somewhat of a falloff in that. And in 1969 there's been an even greater falloff.

Q How many nuclear plants have been ordered so far in 1969?

A I think, one.

Q Mr. Gamble, why have orders for nuclear equipment declined in 1969 and in 1968?

MR. HEDLUND: Are you asking for his opinion or his knowledge?

MR. FUTTERMAN: I'm asking for his knowledge.

THE WITNESS: All evidence points to the fact that the orders placed, say, in '66 and '67 pretty well overloaded the facilities of the manufacturers who had not been fully braced for that rapid a rise in the atomic sales, let's say; and that, plus some realization that it would be better to see some of these plants operating before a company that already ordered one or two made any further commitments, is just normal conservatism, would have a great deal to do with the situation.

MR. FUTTERMAN: Mr. Gamble, by conservatism, did you mean that there are certain bugs and uncertainties concerning the operation of existing plants that have to be cleared up before this conservative attitude on the part [19] of electric utility executives would clear up?

MR. HEDLUND: May I have the witness's answer prior to that question, please? And the question?

(The pending question and answer were read by the reporter.)

THE WITNESS: The operation to date of the light water reactor plants in existence and running has been good indeed, and very encouraging. Their size has been

what is looked upon as relatively small—say, 200,000 kilowatts, or thereabouts. And since many of these new plants have been considerably larger—600,000 to 800,000 and a million kilowatts—the conservatism is based upon product-industry experience that when you extrapolate to larger sizes, always some types of problems just naturally will develop. They usually are not very serious. They usually have been overcome without too much—if you get too far with too much of that large stuff hanging over you, you could be asking for problems that take you additional time and money to clear up. But the conservatism is not based on any poor performance by the reactors which have previously come on the line.

BY MR. FUTTERMAN:

Q Have there been any problems in connection with the operation of, I believe it's the Oyster Creek Plant on the east coast?

A They have just barely gone into operation, if it [20] is in operation. It was going into operation about now. So I would say the answer to that would be "No." The problems at Oyster Creek were associated with some welds during the progress of construction.

* * * *

[23] Costs have gone up from some $440 million to over $700 million in the estimate, and if they had ordered the equipment for that, and I think they probably had, they would undoubtedly have cancelled it. But I don't know that for sure.

Q Mr. Gamble, do you know of any utilities which have placed orders for fossil fuel plants after having placed orders for nuclear plants?

A Yes, I'm sure that a number have.

Q Mr. Gamble, is it possible for a construction delay to have any effect on the per-kilowatt cost of constructing a nuclear power plant?

A Any power plant that's delayed costs more.

Q Is an electric utility more likely or less likely to experience delays in the installation of nuclear plants as opposed to the installation of fossil fuel plants?

MR. HEDLUND: May I have that question, please?

(The pending question was read by the reporter.)

MR. HEDLUND: I don't know how that question could be answered.

THE WITNESS: I would say that the nuclear art being a relatively new art, and the regulatory responsibility of the AEC entering the picture, and the necessity to be sure that in this new art safety is given every reasonable consideration—every possible consideration, really— [24] that there's a greater likelihood of delay than in a relatively established art which the fossil fuel plant is, in which there are not some unknown and certainly not some new frontiers to develop.

Q Is there a greater or lesser degree of technical competence required for nuclear plant personnel as against fossil plant personnel?

A There would certainly be a different type of information and education, you might say, to which fewer people have been exposed so far, than the present generation of operators and engineers who have grown up on the fossil plants. The large ones are by no means simple, and as a matter of fact, it's my feeling that the operation, as such, of a nuclear plant, once everything is in place and going, is really a simpler thing than the operation of a fossil plant. But the technology involved now is different and is certainly complex.

Q Have any existing nuclear plants in the United States experienced any operating problems?

A Well, all plants experience operating problems. I don't care who built them or what type they are. So I'd say they have. But as far as I know—we are confining ourselves to the light water type of plant—there have been no problems that have had any serious bearing on the operation of the plants.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF JACK A. SIMON, TAKEN JULY 31, 1969

* * * *

JACK A. SIMON,

called as a witness by the Plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories, and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.
A Jack Aaron Simon.
Q And what is your home address?
A 502 West Oregon Street, Urbana, Illinois.
Q And what is your present position, Mr. Simon?
A I am Principal Geologist of the Illinois State Geological Survey.
Q And are you appearing today under subpoena?
A Yes, sir.
Q How long have you been the Principal Geologist of the Illinois Geological Survey?
A I have been Principal Geologist for two years, and prior to that, for about fifteen years, was [4] head of the Coal Section of the Illinois Geological Survey.
Q And could you please tell us, just very generally, what the duties and functions of the Illinois Geological Survey are?
A In general, or as it relates to coal?
Q Why don't you do both?
A Well, the Illinois Geological Survey is concerned primarily with geological and geochemical research on natural resources of the State, including the fuels, clays, oil and gas, and a broad variety of industrial minerals. We are concerned with the geology of their occurrence, their quality, and in some measure their fundamental nature, and, with some of the resources, uses.

Q Could you tell us what are the duties of the Geological Survey in regard to coal reserves?

A Well, I would estimate that perhaps half of the fairly extensive program that we have in coal geology is related to a continuous program of mapping of coal reserves of the State, including quality, quantity, and studies of the associated rocks.

* * * *

[9] If we had information that they were coal-handling docks, they are shown; and this information was developed from charts of the United States Army Corps of Engineers.

MR. CUSACK: Mr. Hedlund, does the standing stipulation apply to what has previously been marked as Nugent Deposition Exhibit 38, the map entitled "Shipping Coal Mines in Illinois, Jack A. Simon"?

MR. HEDLUND: Yes.

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q One more question that has some relation to this map: Is the coal field, as set out on this map—

MR. HEDLUND: I object to the phraseology "the coal field," as an incorrect characterization of the testimony of Mr. Simon. There has been no testimony that that depicts a coal field.

BY MR. CUSACK:

Q Mr. Simon, is the area of coal, as set out in this map, also part of an area of coal located in West Kentucky and in Indiana?

MR. HEDLUND: Also object. Mischaracterization. [10] There has been no testimony that the map depicts a coal field.

MR. CUSACK: Will you please answer the question, sir?

MR. HEDLUND: May I have the question back, please?

Q (Read by the reporter.)

MR. HEDLUND: I want to rephrase my objection. There has been no testimony that the map depicts an area of coal.

MR. CUSACK: Will you please answer the question, sir.

BY THE WITNESS:

A The area on this map that has the blue-green color, or approximately that, depicts the area underlain by the coal-bearing sequence of rocks, which is called the Pennsylvanian System, and actually depicts the area of the sequence of rocks, as opposed to coals themselves. This is part of an area which extends into West Kentucky and Western Indiana, which is part of an area that is commonly referred to as a coal basin, although it is not a continuous—It is called a coal basin by virtue of the configuration of this coal- [11] bearing sequence of rocks.

BY MR. CUSACK:

Q Are there any particular specific names, sir, for this coal basin in Western Indiana, Western Kentucky and Illinois?

A Well, it has commonly been referred to as the Illinois Basin, which sometimes has been used in a much more restricted sense. It is commonly referred to as the Illinois-Indiana-West Kentucky Coal Field. It is also commonly referred to as the Eastern Interior Province, which has really been taken from the designation by the U. S. Geological Survey maps of the coal fields of the United States, in which it is described as the Eastern Region of the Interior Province; the Western Region being Iowa, Nebraska, Kansas, Arkansas and Oklahoma; and this Illinois-Indiana-Kentucky portion being the Eastern Region.

Q Would it be proper then, sir, to describe the coal fields of Illinois, Indiana and West Kentucky, that is, Mining Districts 9, 10 and 11, as the Eastern Interior Coal Province?

MR. HEDLUND: Object as leading, and as contrary to what the witness has described the area as it is commonly known.

[12] MR. CUSACK: Will you please read the question, Mrs. Spina?

Q (Read by the reporter.)

BY THE WITNESS:

A I am not really fully informed on what these Districts 9, 10 and 11 are. In general, I know that they apply to those regions, but I really am not familiar enough, and I know I have even used those numbers without being that aware. But in general, the coal production from Western Kentucky, Illinois and Indiana all comes from this area that is described, in terminology of the U. S. Geological Survey, as the Eastern Region of the Interior Province, on their map of the coal fields of the United States.

BY MR. CUSACK:

Q And this has also been commonly referred to as the Eastern Interior Coal Province, has it not?

MR. HEDLUND: Are you telling him that, or are you asking, Mr. Cusack?

MR. CUSACK: I am asking the question.

BY MR. CUSACK:

Q Has it not also been commonly referred to as the Eastern Interior Coal Province?

A Yes.

* * * *

[19] Q Sir, what is the largest state in the United States in total minable bituminous coal reserves?

A Well, as of the latest available information to us, the State of Illinois has the largest reserves of bituminous coal.

Q Is this minable as defined by the report?

A Coal reserves or minable coal reserves, as defined by the report.

Q And what state, sir, has the largest amount of strippable bituminous coal reserves of any state in the Union?

A As defined in this series of reports, Illinois has the largest known reserves of bituminous coal.

Q Of strippable bituminous coal?

A Strippable bituminous—strippable as defined in the studies.

Q And the studies of strippable coal reserves, sir, would include the various publications of the Illinois Geological Survey, entitled "Strippable Coal Reserves of Illinois," is that correct, sir?

MR. HEDLUND: May I have the question, please.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF JOHN E. ORGAN, TAKEN AUGUST 1, 1969

* * * *

MR. SIMS: Mr. Organ, during my direct examination if you do not understand one of my questions or a word, if you will tell me, I will try to clarify it for you. Also, if you have a question as to the location of a county or a city or a mine, we have a deposition exhibit marked Tarzy Deposition Exhibit 1, a map by the Paul Weir Company, that you may feel free to look at to refresh your memory, if you like.

MR. HEDLUND: Off the record.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. SIMS: Will you swear the witness, please.

(The witness was thereupon duly sworn.)

JOHN E. ORGAN,

called as a witness by the Plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid, first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. SIMS:

Q Would you state your name and address, please.

[4] A John E. Organ, 301 West Washington Street, Sullivan, Indiana 47882.

Q How long have you lived in Indiana, Mr. Organ?

A This last time, 36 years.

Q Have you ever lived in Illinois?

A Briefly, yes.

Q During what time?

A 1932, for a few months.

Q Would you describe your educational background?

A Bachelor's in geology at Indiana University, 1928; Master's at George Washington University, 1929; and a year on a Doctorate in 1929-1930.

* * * *

[111] Q This is your personal program?

A Yes.

Q It was not instigated by any coal company; it was your decision?

A It was my idea, and they concurred, and I was busy for that eight-year period, seven or eight years.

Q Well, has the program terminated?

A Yes.

Q And what is your position now, as far as exploration?

A Well, I am just a retired—

Q You have retired?

A Yes. That is, let's say semi-retired.

Q Now, in the last two sentences I read of your report, you used the words "economically minable strip reserves." What do you mean by these words?

A Well, if we don't have anything to do for the next couple of months, maybe we could get into that. No, I don't want to be facetious, but—

Roughly, present day, I would say you had to have thick seam, with ratio that didn't exceed 20-to-1, that is, your top ratio 20-to-1, over 100 feet, and 40-million-ton reserves. Maybe 30 or 35, but—

[112] Q These are the factors that you used in determining what was economically minable strip reserves?

A I think that would be close to it. If it weren't in that neighborhood, you wouldn't be able to talk anybody into doing it.

Q Were there any other factors besides those that you have just mentioned?

A Well, your closeness to transportation, closeness to market, and that sort of thing, quality, would all enter into it to a certain extent, but that would be your main framework of what you are looking for.

Q And that would be the ratio, the height, the overburden?

A Well, you don't know where it starts, but it couldn't be over 100 feet or 20-to-1 at your outside figure, which would give you a workable ratio below that.

Q Well, do you know of any tracts of 40 million tons, strippable reserves, that would not fit in with your definition of economically minable but it would be in one block together, that has not been acquired by a coal company at this date?

A No. Nothing that large.

[113] Q Do you know of anything over 20 million tons?

A Not really, with the possible exception of that spot there north of DuQuoin, which is urbanized to where you can't do anything with it.

Q You refer to the Illinois Basin in these two sentences. You mentioned this earlier, but I want to make sure I understand it.

What is your definition of "Illinois Basin"?

A Illinois Basin is that coal basin which lies wholly within Illinois, Indiana and West Kentucky.

Q Is there any other name for this coal field?

A I don't know. That is the one that I have always used, and most of the geologic fraternity. Some of them call it Eastern Interior, Western Interior, of the Central Basin. I forget just how they word that, but Illinois Basin is the right name for it, I think.

Q Is this a geologically united coal area?

A Yes.

Q Here again you have touched on this, but I want to nail it down.

The last paragraph of your report, the first sentence, which reads:

> "Based upon my knowledge and experience, I concluded that by 1960 there was no longer [114] any possibility of acquiring or establishing or transfer to coal producers or any new economically minable strip coal acreage in the Illinois basin of sufficient size to justify the opening of new mines."

* * * *

[115] Q Turning to the last paragraph of your report, there is a sentence which reads:

> "Within the past two years I have, on numerous occasions, discussed the availability of strip reserves in the Midwest with a variety of coal executives knowledgeable in this field. I have also re-reviewed data released by the Illinois Geological Survey pertaining to this question."

Would you name the coal executives you talked to concerning the availability of coal reserves?

A Yes. Bill Weimer, W. A. Weimer, who is Vice President of Peabody.

Q When did you talk with him?

A I think in 1967.

Q And what did he tell you?

A The thing that stands out in what he told me was that he didn't think over ten percent of the amount shown in the State Geological Survey figures was ever there to begin with. That was before there was any strip.

Q Was this conversation with Mr. Weimer in connection with your employment by Mr. Hedlund?

A Yes, although I don't think I—

[116] You see, a lot of these conversations were at the Mining Congress, at the Illinois Mining Institute, and that sort of thing.

Q Who else did you talk to?

A I remember talking to Broecker, who was of course readily available. I was rubbing elbows with him all the time. He is an Ayrshire Vice President.

I talked to Miller Spears of Morgan Coal Company, Harry Eiteljorg's partner, and has been their coal hunter.

Q What did Mr. Broecker say?

A Well, he is so slightly knowledgeable in this thing. You see, he was a stone man up until ten years ago, so he sort of disqualified himself. He said, "I really don't know enough to be quoting," and I think he was right in that.

Q What did Mr. Spears say?

A Miller Spears said that he would say, if he were asked, that there was no large area available.

But to begin with, he said, "Of course, John, you know we have always looked for a different sort of thing than you are thinking about. We looked for small areas which we could buy." And he didn't add this, but, "We looked for small areas that we could resell [117] or work ourselves."

Q Did he say what size areas he considered small?

A Well, I know one of them was down at Banner, and it was about a million and a quarter tons. A lot of the properties they bought were small tonnage-wise, but they usually were well chosen.

Q This property at Banner, did they not sell this to United Electric?

A United Electric, I think, but I don't know when or what the terms were, or anything about the transaction.

Q Morgan Coal Company does mine coal itself?

A They did, but they sold out to Peabody a number of times, at least twice.

Q They sold out a number of times. Do you mean sold their existing mine?

A Well, sold out, started over again, sell out again.

Q When was the last time they sold out?

A Oh, I think maybe four years ago, something of that sort.

Mr. Eiteljorg and Mr. Spears have been very able operators.

[118] Q This is one coal company, then, that did not require the 40 million block of coals?

A But they bought it, like you, an investor, would if you went out and sniped a piece of choice real estate, figuring on selling it to your neighbors eventually.

Q But they sold it to coal companies, did they not?

A Yes.

Q Are there any other coal executives you talked to?

A Yes. I talked to Hugh Lee, Jr., who is, or was, up until a month or six weeks ago, the Executive Vice President in charge of sales for Peabody, but he used to be President of Maumee at the time it was acquired, in 1959.

Q And what did he tell you about strippable reserves?

A He made the categorical statement that there wasn't any big reserve at that time.

Q Did he define what he meant by "big"?

A No. None of them did, for that matter.

Q What other executives did you talk to?

A I talked to Roy Dean, who was a former [119] Vice President of Ayrshire; and to Arnold Lamm, President of Pittsburg-Midway.

Arnold Lamm made a categorical statement about the lack of strip coal.

Q Do you know what Mr. Hugh Lee is doing now?

A Yes.

Q What is he doing?

A He is Vice President in charge of public relations for Peabody, and he is Vice Chairman of their Executive Committee.

Q Have you talked to all of these people since 1967?

A I would say at least 1966 to 1967, along in there.

Q Now, what did Mr. Lamm tell you?

A Mr. Lamm said, "Of course," he said, "you know I was with United Electric up until some time about 20 years ago," and then he said, "When I came back out to run Pittsburg-Midway, from my venture in Ohio, I found we had a very strong sales organization, specializing in Northern Illinois coal, and we had no coal," and he said, "We turned heaven and earth trying to find it, and we didn't find it."

Q This was in Northern Illinois?

[120] A Yes. Northern and western.

Q Now, who was the other man that you mentioned in connection with Mr. Lamm?

A Roy Dean. He was the former Acting Executive Vice President of Ayrshire. He left there in 1966, I think.

Q What were his comments on the subject?

A No large areas available.

Q Can you recall any other executives you talked to on this question?

A It seems to me I have left out a couple, but it is the sort of thing that strip bidders always get into when they get together.

Q Strip miners are always talking about the availability of strip reserves?

A What a hell of a shape they are in about reserves, and all that sort of thing, and it is all true.

Q Were they talking about it ten years ago?

A Oh, I can't put a number on it, but—

Q Well, is this a perennial thing that strip miners talk about, the lack of strip reserves?

A They always have.

* * * *

[136] Q Is this right in the middle of the Humble properties?

A On both sides of that Monterey property.

Q Do you anticipate this property will be mined at some time in the future?

A Yes. I hope so.

Q Other than what you have mentioned, what have been your underground activities in the Illinois Basin since 1960?

A Well, that is about it. I didn't get anything too positive done other than that.

Q Mr. Organ, have you looked at any underground coal in Washington or in Perry counties, Illinois, since 1960?

A No.

Q Have you ever examined any underground coal reserves in Washington or in Perry counties, Illinois?

A No.

Q Mr. Organ, is it true that in years past strip coal reserves which were once considered not economically minable have become economically minable?

A That is true to a certain extent.

Q At one time it was impossible, was it not, to strip coal under 50 feet of overburden?

[137] A Way back, that is right.

Q Do you have any opinion, sir, or do you have any knowledge, of the maximum amount of overburden which can now technologically be removed over a coal seam?

A No, I don't know. I have lost count on this newer equipment, the real large equipment, but theoretically it

can be removed up to—I don't suppose there would be any theoretical limit, but there is an actual limit because as you increase the size of this equipment the cost increases damned near to the square of it. It isn't—

Q You are not familiar with the Big Muskie shovel of Bucyrus Erie?

A Is that the one over at Zanesville?

Q Yes, sir. In Ohio.

A No, I am not real familiar with it. I have read a little about it.

Q Mr. Organ, you have testified that you have, in the past, taken options on coal reserves. Is this correct, sir?

A Yes.

* * * *

[149] Q Do you believe they will make an attempt?

[150] A Oh, sure. Of course, they have new ownership coming up, which may make a difference.

MR. HEDLUND: May I have that answer back, please?

A (Read by the reporter.)

BY THE WITNESS:

A I don't need to elaborate on that.

BY MR. CUSACK:

Q Mr. Organ, do you believe that any profitable strip-coal producer, operating in the Illinois Basin, will have to eventually get into underground mining in order to remain in business?

MR. HEDLUND: By that do you mean the coal business?

MR. CUSACK: To remain in the coal business, yes, sir.

MR. HEDLUND: In Illinois.

MR. CUSACK: In the Illinois Basin.

BY THE WITNESS:

A If he stays in Illinois, he will have to go in the underground business eventually.

BY MR. CUSACK:

Q Do you feel that the strip-coal mines of the major strippers in the Illinois Basin will be exhausted [151] at about the same time?

A No. There will be a big difference in the periods, due to the nature of the reserve picture.

Q Mr. Organ, do you believe that if a strip-coal company acquires underground reserves that it follows that the strip-coal company eventually plans to mine these underground reserves?

A Yes. If they acquire them, they intend to work them.

MR. CUSACK: Mr. Hedlund, the Government reserves the right to interview or re-depose this witness after you have determined what the subject matter of his testimony will be at trial, if such testimony will cover matters not listed in the report of Mr. Organ as contained in his letter to you dated July 8, 1969.

MR. HEDLUND: Have you finished your interrogation with respect to all the subject matters contained in his report?

MR. CUSACK: We are finished with his deposition. And we would like to thank you, Mr. Organ.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF JOHN PAUL WEIR, TAKEN AUGUST 5, 1969

* * * *

JOHN PAUL WEIR,

called as a witness by the Plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories, and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.
A John Paul Weir.
Q And what is your home address, Mr. Weir?
A 1200 Spruce Street, Winnetka, Illinois 60093.
Q By whom are you employed?
A Paul Weir Company.
Q In what capacity?
A I am Executive Vice President.
Q Mr. Weir, would you please tell us, very generally, your educational background?
A I was educated as a chemical engineer and received a Bachelor of Science degree in 1944.

After service in the Navy, I returned to school [4] and went to Penn State and received a degree in mining engineering, a Bachelor of Science degree.

* * * *

[7] A Our responsibility in that instance was for all of the facilities, from the coal seam on out; that is, the slopes and the shaft, the surface facilities, [8] the belt conveyors overground, and the barge-loading facilities.

We prepared drawings of those facilities and prepared invitations to bid, performance specifications, and they were sent out for bid, so that the bids, when received from the contractors, could be compared and let.

Q Were the duties of the Paul Weir Company in regard to the Hamilton Mine parallel to the duties in regard to the Crown Mine?

A Not exactly. Somewhat similar responsibilities, however.

Q What were the differences, just very generally?

A In the case of the Crown Mine we were also charged with the actual layout of the underground; in the instance of the Hamilton Mine we were not. I would say that was the basic difference.

Q I see. The layout would be the same as the mining plan. Is that fair to say?

A That is right.

Q And you say you worked on the Hamilton Mine. Was that in the 1960's?

A That is right.

* * * *

[16] THE WITNESS: May I look at our map?

MR. CUSACK: May we go off the record for a minute?

MR. HEDLUND: Sure.

(There was discussion off the record, after which the taking of the deposition was resumed, as follows:)

MR. CUSACK: Will the reporter please mark, as Weir Deposition Exhibit 1, a map entitled "Illinois-Indiana-West Kentucky, SHIPPING COAL MINES, January 1969, Prepared by Paul Weir Company, Incorporated."

(The map was thereupon marked Weir Deposition Exhibit 1 for identification, 8-5-69.)

BY MR. CUSACK:

Q Mr. Weir, before I get back to the last question I posed to you, would you please identify what has been marked as Weir Deposition Exhibit 1 for identification?

A This is our published map of shipping coal mines in Illinois, Indiana and West Kentucky. It is copyrighted as of January 1969, and it shows all of the large mines in the Illinois Basin.

[17] Q Incidentally, the Illinois Basin, does that include the coal regions of Illinois, Indiana and West Kentucky?

A That is correct.

Q And is the term "Eastern Interior Coal Province" synonymous with the term "Illinois Basin"?

A Correct.

Q Thank you.

Mr. Weir, is the information contained on Weir Deposition Exhibit 1 correct?

A To the best of our knowledge, yes.

Q Now, if I can rephrase my prior question, with permission of counsel, I believe I asked you what feasibility studies the Paul Weir Company had performed on any of the strip mines located in the Midwest Coal Field —which is also synonymous with the Illinois Basin, is that correct? Midwest Coal Fields and Illinois Basin is the same thing?

A Yes.

THE WITNESS: Do you mind if I refer to this map?

MR. CUSACK: Please do.

* * * *

[52] Generally, with a thin seam, less of the actual coal is actually recovered, in an effort to keep the raw product relatively clean. With a thick seam, more is recovered, and we think a reasonable estimate for this thickness of seam is a mining recovery of 85 percent. Then the preparation recovery will vary according to the characteristics of the coal. Although we did not have very good information on the washability of this particular coal, we estimated 80 percent. So that the overall recovery, as I have said, the product of the two or 68 percent.

Q Do you know what the overall recovery is of the coal at the Banner Mine of United Electric?

A I know that roughly it is within this same order of magnitude.

Q Sir, is it possible that the Industry coal could be sold raw, as mine-run coal?

A It is very doubtful.

Q In your opinion?

A Yes.

Q And on what do you base that opinion?

A The unwashed product just wouldn't measure up to the marketplace.

* * * *

[58] Q What I am trying to determine, Mr. Weir, is: Other than the information that you have set out in Weir Deposition Exhibits 4-A and 4-B, and as I understand your testimony, the schedule of properties on Exhibit 4-B are the properties which are contiguous to the present controlled acreage at Industry, what I am trying to determine is, do you have an estimate of what noncontiguous reserves near the Industry Field could be added to the Industry Field if United Electric made a business decision to expand the field?

A I am afraid I can't answer until you tell me what kind of reserves.

Q Well, let me put it this way—

A Economically minable reserves?

Q Reserves similar to the reserves now held in fee at Industry.

A Only drilling would prove the character of the additional reserves that might be put together in that area. However, we would expect those to be somewhat inferior to the reserves in the Industry Field.

Our report points out that the Industry Field, in our opinion, is marginal, and we would [59] question a business decision of acquiring more reserves in this area.

Q In regard to the conclusion of your report terming the Industry Field to be marginal, would you anticipate that the Industry Field may become economically minable at such time as the strip reserves in the Fulton-Peoria area, in Fulton County and in Peoria County, are exhausted?

MR. HEDLUND: Are you talking about all—well, let me have that question back again, please.

Q (Read by the reporter.)

MR. HEDLUND: Mr. Cusack, I don't understand the context in which you are using "strip reserves."

Do you mean those strip reserves—and confining it to the two counties you mentioned, Peoria and Fulton—as

are presently either being mined or are owned or controlled by existing producers?

MR. CUSACK: Yes. Or are available in those counties.

MR. HEDLUND: Well, all right, if the witness has an opinion.

[60] BY MR. CUSACK:

Q Do you have an opinion, sir?

A I do have an opinion. I don't think that these reserves will ever be mined, in any circumstance.

Q On what do you base that opinion?

A Because coal can be mined elsewhere at lower cost.

Q Where, sir?

A If this coal was going to be hauled to the river, lower-cost coal could be moved to that point; for example, from the Belleville district, from proposed mines on the —underground mines on the Kaskaskia River.

Q Is it your testimony then, sir, that the proposed underground mines on the Kaskaskia River will, in the next, is it fair to say 20 years, be more economical than strip mines located in Schuyler and McDonough counties?

MR. HEDLUND: I don't believe that is his testimony. He has not so stated.

BY MR. CUSACK:

Q Would that be your opinion, sir?

MR. HEDLUND: Are you talking specifically about the Industry Field, or are you also [61] including Sun Spot or—

BY MR. CUSACK:

Q I would include any mines located in Schuyler and McDonough counties.

MR. HEDLUND: May I have the question back, then, please.

(The question was thereupon read by the reporter, as follows:

"Q Is it your testimony then, sir, that the proposed underground mines on the Kaskaskia River

will, in the next, is it fair to say 20 years, be more economical than strip mines located in Schuyler and McDonough counties?")

BY THE WITNESS:

A My opinion is that they would be more competitive.

BY MR. CUSACK:

Q Then strip mines located in Schuyler and McDonough counties?

A That is right.

Q And these underground mines, sir, to be located on the Kaskaskia River, in what counties are these, sir?

[62] A Primarily in St. Clair County.

Q Who are constructing these mines? Do you know?

A Peabody Coal Company has substantial reserves in this area.

Q And when are these mines expected to be in operation? Do you know?

A Several of them will be developed within the next five to ten years.

Q Is it your opinion that these mines will supply some of the demand formerly supplied through the Fulton-Peoria mines?

A Yes.

If I may amplify that answer.

Q Yes. Please do.

A Number 2 coal production by stripping, in this immediate area, has been a marginal situation. The Industry reserves are less attractive, the overburden ratio is heavier, and the coal is located further away from water transportation, so that they are even more marginal than the existing marginal operations, and we doubt very, very much whether such reserves would be developed.

* * * *

[65] BY MR. CUSACK:

Q And these new mines you are referring to are the deep mines on the Kaskaskia River, is that correct?

A Those, and possibly others.

Q These new mines on the Kaskaskia River will be underground mines, is that correct, sir?

A That is correct.

Q Are strip mines, as a general rule, more profitable than underground mines?

A I couldn't give you any general rule. It depends very heavily upon the overburden ratio. This is pointed out in our report.

Q Do you know of any underground mines in the Central Illinois Freight Rate District which are as profitable as the United Electric mines, strip mines?

This is, of course, on a tonnage basis.

MR. HEDLUND: Are you including all United Electric strip mines?

MR. CUSACK: All four, yes.

BY THE WITNESS:

A That is a rather broad question. Which United Electric mine are you talking about?

BY MR. CUSACK:

Q I was referring to all of them, but if you [66] would like me to do it individually, that would be fine.

A The difficulty comes in the difference in capital investment for strip mines, and that is so heavily dependent upon the ratio, as indicated in our report.

With a high overburden ratio the capital investment is likely to be very high, so that a very high cash flow is necessary for profitable operation, a high realization. Well, this is much less so with an underground mine, where the capital investment is less. And eventually the point will be reached where the capital investment for strip mining will be so high that strip mines will no longer be able to compete.

Q Generally speaking, then, is it a fact that a deep mine is less expensive to open than a strip mine?

A This is certainly the trend in the Illinois Basin, as the shallow reserves are being mined out and what is left is under heavy cover, and in many instances such heavy cover that the reserves are not economic and probably will never be mined.

Q Do you anticipate that in the next ten or fifteen years most of the mines which are going to be [67] mined in the Illinois Basin will be deep mines?

A Certainly. This is inescapable. That is just the nature of the reserve picture in the Midwest, and the economics of deep mining versus strip mining.

Q Other than the Denmark acreage of Ayrshire, are there any substantial strip coal deposit remaining in Illinois, according to your opinion?

A We made the statement in our report, and it is our opinion, that there will be no more comparable large mines through Denmark. There will be a few more smaller mines of the range of perhaps 750,000 tons to a million tons annual capacity, and this is because the available tracts of economically minable reserves are of the order of magnitude of five to ten million tons, perhaps somewhat more. But we are generally familiar with the inventory of coal reserves that these strip mining companies have available, and large blocks of it will support large economical operations just don't exist.

Q Is it your testimony that in the next ten or fifteen years there will be a few strip mines opened with total reserves of approximately ten million tons?

A A few, yes.

Q And where do you anticipate that these will [68] be opened? What counties, for example?

A I believe that there will be additional operations in west Kentucky.

Q What about in Illinois?

A Actually, no particularly likely prospects come to mind. I don't know of any that are really in the wind. That is not to say that the operating strip-mining companies do not have some reserves left, but not of the type that will support large-scale mining.

Q Have you made any study for the Commonwealth Edison Company in regard to coal reserves, strip coal reserves, located in Adams County, Illinois?

A No.

Q Have you made any study for the Pittsburg & Midway Coal Mining Corporation in regard to strip reserves located in Adams County?

A No, we have not.

Q Have you made any study for any coal company or any coal consumer, or for anyone else, for that matter, in regard to strip coal reserves located in Hancock County, other than the Augusta Field, which we will discuss?

A No specific study. We are generally familiar [69] with the coal occurrence in those areas.

MR. HEDLUND: Is the Government familiar with such studies by anyone else?

MR. CUSACK: No.

BY MR. CUSACK:

Q Did you know that United Electric operated a strip mine near the town of Rushville, which is fairly close to the town of Industry, in McDonough County?

A At what time?

Q In the 1940's and early 1950's, I believe.

A No, I am not familiar with that one.

What was the name of the mine?

Q I believe they call it the Rushville Mine.

A I am not familiar with it.

Q Directing your attention, sir, to the 1980's and 1990's, approximately 25 to 30 years from now, in your professional opinion do you believe that there is any possibility that the Industry Field may be mined in this period of time?

MR. HEDLUND: Asked and answered. The witness has testified he doesn't believe that coal will ever be mined.

MR. CUSACK: Please answer the question, sir.

[70] Will you repeat the question, please.

Q (Read by the reporter.)

BY THE WITNESS:

A There is practically no possibility.

BY MR. CUSACK:

Q In your opinion?

A In my opinion.

Certainly it is technically possible to mine the coal. That isn't the question. Whether it is competitively

practical or it is feasible to do it and make a decent return is very questionable, and I don't believe it ever will happen.

The major strippers do not have positions in that coal seam, in that area, and I refer to Peabody and Consol; that is, any reserves that they have are strictly minor, and they have no plans for the area.

Q Is that determinative of your opinion?

MR. HEDLUND: What do you mean by "determinative"?

BY MR. CUSACK:

Q Is that the main factor on which you base your opinion?

A No, it is not.

* * * *

[120] Q And the Sun Spot coal, sir, moves to a loading dock on the Illinois River opposite Beardstown, Illinois, is that correct?

A That is right.

Q In the fourth paragraph, sir, at Page 2 of this letter, the statement is made that larger excavating equipment permits the removal of as much as 125 feet of overburden.

Do you know, Mr. Weir, whether or not there is stripping equipment now on the market which is capable of removing over 125 feet of overburden?

MR. HEDLUND: May I have that question, please?

Q (Read by the reporter.)

MR. HEDLUND: Do you mean as an engineering matter?

MR. CUSACK: As I phrased my question.

BY THE WITNESS:

A Do you mean in a single cast?

BY MR. CUSACK:

A No, sir; I don't mean in a single cast.

Is there one piece of equipment available today which can remove more than 125 feet of overburden over a coal seam?

A In a single cast, that is about the effective [121] limit.

Q What do you mean, sir, by a "single cast"?

A By picking up the overburden and simply spoiling it. If you get beyond about 125 feet of cover, the spoiling problem becomes severe, and because of the nature of the spoil the pressure will tend to make the spoil squirt out from the bottom.

Q Is there equipment using a double cast, or more than one cast, which can strip more than 125 feet of overburden?

A Technically, yes, as distinct from economically.

Q What are the present technological limitations—What, at present, is the greatest amount of overburden which can technically be removed?

A In copper mines, small shovels and trucks hauling the overburden away, there are no real limits, technically.

Q I am referring in coal mining, with a single piece of equipment.

MR. HEDLUND: Well, now, may I have the question back, so modified?

Or would you restate the question.

MR. CUSACK: Yes.

[122] BY MR. CUSACK:

Q What, at present, is the maximum overburden in a coal mine which can be removed by equipment now available?

MR. HEDLUND: May I have that back, please?

Q (Read by the reporter.)

MR. HEDLUND: Are you confining, in your definition of coal, to bituminous coal, or are you also including sub-bituminous, lignite and brown?

MR. CUSACK: Bituminous coal.

THE WITNESS: Are you referring to the tri-state area?

MR. CUSACK: No, sir. I am referring to anywhere.

THE WITNESS: Are you referring to a single piece of equipment without assistance?

MR. CUSACK: Yes, sir.

BY THE WITNESS:

A Then I believe the effective limit would approximate 100 to 120 feet, depending somewhat on the type of overburden.

BY MR. CUSACK:

Q What is the maximum overburden now being [123] removed in the tri-state area of Illinois, Indiana and West Kentucky, that is, the Eastern Interior Coal Province?

A Probably 160 to 170 feet, but this is not accomplished without rehandling of overburden, which involves additional cost.

Q And, sir, what mine in the Eastern Interior Coal Province is now removing overburden at 165 feet?

A I could mention that the Homestead Mine of Peabody in West Kentucky is stripping to such depths to recover multiple seams.

Q Multiple-seam thickness.

A That is right.

Q How far from the surface of the land is the first seam, the seam closest to the land?

MR. HEDLUND: Closest to the surface?

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q Closest to the surface.

A Probably up to as much as 70 feet.

Q In regard to single-seam mining operations, strip mining operations, in the Eastern Interior Coal Province, what is the deepest overburden now being removed? Do you know?

[124] A Again, probably 100 to 120 feet. The limitation is not only technical; it is economic.

Q And, sir, at what single-seam operation in the Eastern Interior Coal Province is overburden being removed at 120-feet thickness?

A I would say a mine such as River King.

Q Can you think of any others?

A Well, that one comes to mind.

Q Is River King economically profitable?

A Yes, it is.

Q I understand, Mr. Weir, that the Paul Weir Company counseled the Humble Oil Company in regard to the opening of its new mine at Carlinville, Illinois, is that correct, sir?

A Not strictly correct. We did make studies for Humble of mining costs for some of their reserves in Illinois, including the reserve where they eventually decided to open a new mine.

Q And did you assist—

A We drilled these reserves for them, and then proceeded with a mining cost and a capital cost for them, and subsequently they decided to open a mine.

* * * *

[131] Q Will it increase the cost of mining underground coal?

A Yes, it will.

Q Do you have any idea of approximately what percentage increase in costs mine safety legislation will result in?

A I certainly wish I did. The whole coal industry is trying to assess that.

Q What is your assessment of the range of the increase in cost?

A I just don't have any meaningful basis for any opinion.

Q Assuming, sir, a continued situation of short supply of coal, continued increased demand of coal, and assuming increased costs of underground mining due to mine safety legislation, do you anticipate that strip coal reserves heretofore thought to be uneconomical may become economical?

MR. HEDLUND: May I have that question back, please?

Q (Read by the reporter.)

BY THE WITNESS:

A Well, sir, I think that question is answered broadly in our report, when we project a peaking in the [132] total production of strip coal in the Midwest here within a few years, for the reason that we do not think that

these strip reserves are going to be economically minable. Investment costs will be so high that underground coal, with a lesser investment cost, will take the brunt of the expansion, and there will be a tremendous expansion underground, and a peaking-out on the start of it, a climb, in strip mining. This is despite this health and safety.

I think the figures are shown in our study, in our report, that each point of overburden is very significant in terms of investment costs and costs of strip mining.

MR. CUSACK: I have no further questions.

I want to thank you, Mr. Weir.

MR. HEDLUND: Could we take a break for a few moments?

MR. CUSACK: Yes.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF S. SMITH GRISWOLD, TAKEN AUGUST 19, 1969

* * * *

S. SMITH GRISWOLD,

called as a witness by the plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. EISEN:

Q Will you state your name, please.
A My name is S. Smith Griswold.
Q What is your address?
A This is 1660 L Street, N. W., Washington, D. C.
Q Where is your home?
A My home is at 1310 27th Street, N. W., Washington, D. C.
Q By whom are you employed?
A I am employed by Seversky Environmental Dynamics Research Associates, commonly known as SEDRA.
Q Have you been asked to testify in behalf of the defendants in this litigation?
[4] A I have been asked, or the firm has been asked, to prepare a report in connection with this case.
Q Well, isn't it your understanding that you are expected to give testimony?
A That I might be expected, yes. That is right.
Q You say it is your understanding that you might be expected to, or—
A Yes. To prepare a report and give testimony. That is right.
Q Just in one sentence, what is the nature of that report?
MR. KEMPF: I am going to object to that. If the

witness does not feel that it can be adequately explained in one sentence, I certainly would encourage him to go beyond it; or if the question is too broad, to perhaps ask for a more specific question. But if he can handle it in one sentence, I certainly have no objection to him doing so.

BY THE WITNESS:

A Well, the title of the report is "Impact of Sulfur Oxide Regulations on Midwest Coal Markets." [5] That might be a reasonable explanation, a short one. I think it goes a little bit further than that, but—

BY MR. EISEN:

Q Yes. I will get into that a little later.
A All right.
Q Is it Dr. Griswold?
A No, it isn't.
Q How long have you been with—
What was that abbreviated expression?
A SEDRA.
I have been with this firm since last September 1st, 1968.
Q And what is your position with SEDRA?
A President.
Q What does SEDRA do?
A We are consultants to various clients, which include state governments, local governments, industrial organizations, public utilities. That just generally covers it.
Q How many employees does SEDRA have?
A We have at the present time, Mr. Eisen, six full-time employees.
Q What are their professions or training? Do you know?
[6] A Yes. Two of them are engineers, specializing in sanitary engineering, one of them is a technical writer and analyst, one of them is an instrument and engineering technician, and one of them is secretarial, and myself.
Q How long has SEDRA been in existence?
A Just since September of 1968.

Q Are you one of the persons who formed the organization?

A Yes, I am.

Q What did you do prior to forming this organization?

A Immediately prior to that, I was Assistant Director of the National Air Pollution Control Administration under Mr. MacKenzie, and more lately under Dr. Middleton. That was for three years, starting October 4 of 1965.

Prior to that, for eleven years, from 1954 through 1965, I was the Air Pollution Control Officer of Los Angeles County Air Pollution Control District.

Q And if you want to go back prior to that time and tell us what you did then.

A Immediately prior to that, I was an officer [7] in the Navy during the Korean War, for two and a half years; prior to that, I was the Assistant Administrative Officer of the County of Los Angeles; prior to that, I was in World War II; prior to that, I was an efficiency engineer with the Chief Administrative Office of the County of Los Angeles.

Q Would you tell us your educational background.

A I am a graduate, cum laude, from Stanford University, and I have a Master's Degree from Stanford University.

Q In what—

A Governmental Administration, Mr. Eisen.

Q As opposed to Science?

A Political Science and Economics was my minor. My graduate degree was in Governmental Administration.

Q Would you repeat for me again, please, what your title was during those eleven years—

Was it with the City of Los Angeles?

A No. It was the County of Los Angeles. Air Pollution in California is a function of County Government, operating under a State Enabling Act, whereby an Air Pollution Control organization can [8] be activated, and its rules and regulations have the force and effect of State law, in a County, for instance.

Q And what was your task? What were the duties of your office there?

A Well, I started—as you might imagine, it seems a little odd for an administrator to be running a technical engineering organization.

I had returned from the Korean War, and it was in 1954 that the lid blew off, politically, on air pollution or the smog problem in Los Angeles, and the elective officials were very concerned because the public reaction was very bad.

I had set up and reorganized many governmental departments during this population explosion there, so I was very experienced in organizing both line operations and staff operations, so they sent me to find out why so much money had been spent and the smog was getting worse.

In the course of that study I traveled extensively, visiting all the Air Pollution Control agencies throughout the United States, and then started a careful investigation, which was rather unusual, because the County Counsel and [9] myself were sworn in, as Deputy County Clerks, to take sworn testimony from the 127 employees of the Air Pollution Control District.

There had been some appearances before the Grand Jury which indicated that there was misfeasance or malfeasance, and while it wasn't considered sufficient to bring out formal charges, yet they wanted a thorough investigation on an administrative basis, which meant cross-examining 127 people to find out what was happening to the program and why it wasn't going, but none of the charges appeared justified. And following this—

Q Excuse me. May I interrupt for a minute?

A Sure.

Q You say misfeasance or malfeasance. Was this on behalf of the officials, or industry?

A No; the employees of the Air Pollution Control District, whether they conducted themselves properly in all cases. This was more on the order of an administrative hearing, Mr. Eisen.

Following that, a complete reorganization and a build-

up of the air pollution control function of the county government was justified, and during that period, 1954, while I was running the organiza- [10] tion, reorganizing, I spent a year looking for someone to run it, and no one would touch it because of the fact that they felt it was a job kind of like the manager of the old Kansas City Athletics.

There had been four previous Air Pollution Control officers in the period of 1948 to 1954, and no one wanted to take the job. The pay was right, but the longevity was poor. So just gradually I backed into this. I couldn't find anybody to touch it, so I became more and more acquainted with this, more and more interested in it, and found it much more challenging, and in the period from 1954 to 1957 this organization was built up, engineers trained of every type except civil, instruments were developed, and electronic data processing and the first air monitoring systems set up.

In 1957, I had a $4,350,000 budget, which was more money than was actually spent by all the other government agencies, including the Federal Government, combined.

Successively, over the years, I have testified, I think, on every bit of Federal Air Pollution Legislation, including the original [11] Public Law 159.

Out there in Los Angeles, nearly every year, we did about a million dollars worth of research work, original research work, with the scientific back-up, under a director of research, and this was just a heavy load to carry, you know, at the expense of the property owner, so it was to our advantage to promote, in every way possible, the Federal Government getting into the research field, because we felt that air pollution, as a coming thing out there—because of the meterology, it would hit there most severely—a lot of work had to be done, particularly with regard to the effects of air pollution on health, and we weren't at all qualified to do that. We knew how much contaminants were coming out of where, and we knew considerable about the reaction of the contaminants that go into the atmosphere, but we had no expertise at all, nor did anyone, in determining

at what levels and under what conditions air pollution affected the health of the individual.

* * * *

[13] The latter part of this time in working on the automobile, I became involved with the Department of Justice in connection with having them look into the possibility of the "big four" companies becoming involved in violation of the Antitrust Act, which is the case that Bernie Hollander took over from Sam Flatow.

Q The El Paso Natural Gas?

A No. I was a Government witness, or I was subpoenaed, on the El Paso Divestiture in Salt Lake. I can't remember what year.

Q What is this "big four" case? I am not familiar with it.

A The case is still pending, the Federal Grand Jury case, and it was held in connection with product fixing by the automobile manufacturers. It is a case that Mr. Flatow carried on for several years, under—there was a Chief of the Antitrust Division whose name started with the letter "O."

Q Orrick?

A Orrick. Orrick was there at the beginning, Mr. Zimmerman was there, and I think the last person [14] I talked to, in Antitrust, was Mr. Turner. I have never discussed it with Mr. McClaren, but I have with Mr. Bernie Hollander, who has the case now. It is still pending. It has been going on for quite a few years.

Q Did you determine at any time what percentage of the air pollution in Los Angeles was caused by the automobile, the motor vehicles, as against other means of pollution?

A Oh, yes. We kept, Mr. Eisen, a very careful analysis—in fact, we had a little pamphlet.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY THE WITNESS:

A Because of the very stringent regulations that have been placed in effect and enforced on Los Angeles, which is the third largest industrial complex in the country, the automobile, tonnage-wise, is responsible for around

87 per cent of the total amount of tonnage of air pollution. However, this is rather comparing oranges and carrots. I mean, a large portion of this, of course, is carbon monoxide, a large portion of it is hydrocarbons, and [15] about half of the oxides of nitrogen come from motor vehicles. These are either toxic gases or precursor —end up by being toxic gases.

• • • •

[20] Q How far away would you say the nearest coal field is from Los Angeles.

[21] A I would say 700 miles. It is shorter than where we bring the gas from, which is Texas, the Permian Basin, El Paso line.

Q You mentioned that sulfur dioxide accounts for a certain percentage of air pollution emissions.

A Yes.

Q What are the approximate percentages of pollution emissions, if you know, say in the Chicago Metropolitan Area, accounted for by sulfur dioxides, carbon monoxide, et cetera?

A I wouldn't know, tonnage-wise.

I know that in my responsibilities with the Federal Government—of course I came back here as an enforcement officer; you know, as someone who had taken about 10,000 people to court, with a record of 96.6 per cent convictions over that period of time.

I was brought back here when the Federal Government started its control program, at least my title was for enforcement and control, and I had several responsibilities here which I originally set up and staffed, set up the laboratories, and one of the original ones was to meet with the Executive Officer of the President, Bureau of [22] the Budget, to develop the program for controlling Federal facilities.

It was very strongly believed that before the Federal Government entered into any kind of enforcement program, in states or in connection with industry, that they should set an example themselves, and hopefully that example would be followed by state and local government agencies, and they in turn would carry on this program with industry.

But in connection with that, one of the original studies we made—and Mr. High was one of my staff who was in charge of this—was the Three-City Sulfur Study, where we studied the sulfur levels in New York, Chicago and Philadelphia; and in connection with the Federal facilities, how much control the Federal facilities of those three areas should have on the fuels that they used in the buildings that they operated, the various types of facilities, and this was regardless of which department operated them; and out of that we developed a program to control the fuels, set limits on the sulfur in the fuels burned, and an overall general limit for the United States as a whole, but more stringent regulations for those three cities.

* * * *

[34] Q Are you familiar with the Perry and Fields paper on coal and sulfur dioxide pollution?

Perry is the Director of Coal Research for the Bureau of Mines, at least he was.

A Yes. I know him personally.

MR. HEDLUND: May I have the question, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A I have read many of his papers, naturally. He has, over the years, done a lot of work on that.

However, in connection with the prepara- [35] tion of the report, Mr. High and my staff put that together, and I am not intimately acquainted with all the details of it.

MR. EISEN: Would you read the answer, please.

A (Read by the Reporter.)

BY MR. EISEN:

Q I take it the report you are referring to is the "Impact of Sulfur Oxide Regulations on Midwest Coal Markets," prepared by Seversky Environmental Dynamics Research Associates in connection with this case?

A Yes, Mr. Eisen.

Q You indicated that Mr. High had contributed to the preparation of this report.

A Yes.

Q Were there other persons who contributed to the preparation of the report, besides yourself?

A Mr. LiPuma and Mrs. Beeland.

Q What are their positions?

A One, as I mentioned before, is Assistant Engineer to Mr. High, and Mrs. Beeland is our analyst and technical writer.

Mrs. Beeland has been with the Western [36] Oil and Gas Association for fourteen years, here in Washington, and is very well acquainted with many source materials, including Interior and NAPCA. She also worked for me when I was out at the National Air Pollution Control Administration.

Q Were there areas of primary responsibility delegated to these persons you named, in putting this report together?

A Yes.

Q Could you describe for us, say by looking at the Table of Contents, or any other way that you care to describe for us, the manner in which the responsibilities were delegated?

A The research on the recent regulations in affect in various cities and areas, together with insuring that they were current, and keeping in touch with subsequent pending developments that might occur, were Mrs. Beeland's responsibility.

The material generally on coal processes and the stack gas cleaning operations were generally in Mr. High's area of expertise.

Q And Mr. LiPuma?

A Mr. LiPuma assisted Mr. High.

* * * *

[40] Q Do you mean as distinguished from the burning of coals?

A From the burning of coals, that is right.

But in those areas, while I am not intimately acquainted with the levels, I know that they are extremely high. They are extremely high in mid-city; they are extremely high under certain operating conditions. I would consider that two per cent sulfur coal will be found to be high in that St. Louis area.

I think inevitably, if coal continues to be burned in that area, it will have to be down to one per cent. This is what the control officials are going to want.

I think in Kansas City—now, this is just a little bit over to the other side there. Now, there, two per cent coal might be acceptable for a while. But like all other things—I am sure that you, working for the Government, understand this—a control official, with the responsibility for public health, has to look forward to what he is going to do when; and reasonably, like in industry or anything else, he should look forward to what he wants to accomplish ten or fifteen [41] or twenty years from now.

* * * *

[54] BY THE WITNESS:

A I would say definitely they would, Mr. Eisen, have to develop methods to desulfurize the coal or clean up the stack gases.

BY MR. EISEN:

Q Do you have an opinion on whether or not such methods will be developed?

A I have had knowledge of methodologies to clean up coal and oil, residual oil, for quite a few years. I was slightly interested in this in 1954 and 1955 in Los Angeles, on residual fuel oil.

Now, there, in that area, on trying to clean up residual fuel oil, multiple programs or equipments were built, two of them, to my knowledge, cost well over a million dollars, and it failed, and they had high hopes.

A very famous professor, Dr. Haagen-Smit, internationally known, was going to make fertilizer out of the stack gases, ammonium sulfats. It could be done with burning coal.

There have been many, many suggestions by the coal industry and the oil industry that have been worked on. As of right now, I don't know— [55] and I am acquainted with several, as you know from this report—of any that is going to be on-stream in a large electrical power generating complex that will be economically acceptable within, I would say ten years, maybe more, where these processes are refined to a point where they are going to be generally available for new power plants burning coal, or the planning of them.

Q Is it your testimony that it would be within ten years or more?

A I would say ten years or more.

Q Would you say about ten years, based on your knowledge and experience with the residual fuel oil research?

A I would say more.

Now, methodology has been developed, Mr. Eisen, in connection with desulfurizing fuel oil by hydrogenation. It is a very expensive process. It gets more expensive the lower you want to get the sulfur in the fuel oil.

Q How expensive is it?

A Well, it ranges. It can go as high as a dollar a barrel, if you wanted to get it down real low, 42 gallons. It has run, on not getting [56] it quite so low, 35 cents a barrel, which is fairly good.

* * * *

[87] Q Getting down to some of the concretes, though, they have been using a pilot system at Union Electric, have they not, for the past—they started it last year? They are testing out a system of dolomite and wet-scrubbing?

A Oh. This is the Combustion Engineering application. Yes, they have been using that. They have had it for the past year. I think its operating time during all that period of time was 31 days.

Q That is right. Well, I didn't suggest, sir, that this was a presently operating system, but they are down to the point of at least using it to that extent, and they plan—

A To that extent, with a lot—

Even Combustion Engineering, which is a very, very fine firm, and very qualified in the field, admits that they are a far, far cry from an installation on a major power plant.

Q Well, if—

A They have corrosion problems, they have every kind of a problem. They have got so many problems they didn't think about, that they haven't [88] gotten around, in some cases, to figuring out what the answers are to things they planned to determine in this study.

Q Well, from what I have read in their study, I don't believe I recall them using any expression like

"far, far cry" away from something. They admit that they have problems.

I would like to ask you if you can tell me from where you get this information that they are far, far away.

A Well, "far, far," might be carrying it too far. If I said one "far" for ten years to a commercial application, that is what I would say by "far, far."

Q But did they say they are ten years away from a commercial application?

A No. I wouldn't expect them to.

I would also submit that I have seen other applications, far less complex, with just the obvious problems that they have; the type of stuff they are dealing with, the volume of the stack gases, the economics of this. I would say that if you gave them limitless money and guaranteed them a market, they could go ahead, and on a crash basis, like [89] getting to the moon, or something, they could get this thing through in a shorter period of time.

* * * *

[147] MR. HEDLUND: Mr. Eisen, I want to point out, in just the hopes of trying to shorten this, that that is shown on the face of the table, if you will look at the asterisks and the legend at the bottom.

MR. EISEN: Do you know the question, Mr. Griswold?

THE WITNESS: No. I would like it repeated.

MR. EISEN: Will you read the question, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A It pertains to those marked with an asterisk.

BY MR. EISEN:

Q So in each instance where there is an asterisk—

A This makes it possible to—

You will notice that all of these are described as maximum allowable sulfur content by weight, rather than allowable emission rate.

Now, where the asterisks are, it is an [148] emission standard, where the conversion was made from one to another.

A regulatory agency has to make a decision, when it drafts its regulations, for instance in connection with fuels, whether you are going to limit the sulfur in the fuel—regardless of what type of fuel it is—or whether you are going to limit the emission from the combustion of that, what comes out of the stack.

Now, there are very good arguments both ways, but most Control Officials will, by reason of the effective implementation and enforcement of this limitation, limit the sulfur in fuels. This is easy to police. You go around and pick up a sample, run it through a lab analysis, you determine the amount of sulfur in the fuel. Conversely, it is extremely difficult to police what comes out of the stack. A lot more parameters are involved, not only the sulfur in the fuel, the emission characteristics, but the actual physical problem of analyzing the stack sample, climbing the stack, taking a sample.

We do that here, and when we do it, we charge a client anywhere from, depending on the [149] stacks, from $1,000 to $9,000. It means, in several cases, scaling the stack, putting in probes, and carrying instruments around; and it is an almost impossible regulatory process.

Now, as we get on closer down the line to where you are getting effective scrubbing or stack-cleaning devices, we may have to come to this, but as of the present time there hasn't been any. And while people are writing regulations in these terms, of how much comes out of the stack, on the basis that you don't need to be concerned with what goes into the boiler; you have just got to be concerned with what is coming out of the boiler, why, Control Officials are going to have to be faced with this, to determine whether that equipment is operating close to design and meets these limits, whether it is being maintained, whether it is corroding or falling apart; I mean, all those characteristics that make the difference between what you are permitted to put out of that stack and what you are actually putting out.

Now, I made the decision one way. I made it because—and others are still making [150] it today. They are limiting the sulfur in the fuel, and that is because there is no present adequate method for cleaning the stack gases of sulfur dioxide, or of anything else that I know of. There are ways of doing that. You use an afterburner on solvent vapors, which are combustible, but you can determine an operating efficiency on that, and if there is very little deterioration factor. But here you don't have corrosion problems, you don't have a lot of other problems. It is just an easier way to implement this type of regulation.

Q Referring to "Chicago," on page 14, Table 2, there are three dates there: July 1, 1970, July 1, 1971, and then January 1, 1973, with three different percentages of maximum allowable sulfur.

Do you know whether those dates are accurate as of today?

A I believe they are, Mr. Eisen. They are the same.

Q On the same page, in the next to the last paragraph, you refer to reports of various state air pollution agencies.

[151] MR. HEDLUND: What page are we on, Mr. Eisen?

MR. EISEN: This is on page 16.

BY MR. EISEN:

Q In the paragraph beginning "Without exception," from whom did you get this information?

A We got these by contacting the cognizant officials in each area.

Q Minnesota, Wisconsin, Michigan, Iowa, Missouri, Illinois, Indiana, Ohio, Kentucky, and Tennessee?

A Yes.

Q And it says they "report varying stages of activity in developing new sulfur dioxide standards or revising old ones."

A Yes.

Q What is the trend, if any, that you were concerned with?

A The trend is toward more stringency.

Q More stringency in the sulfur in coal, or the emission—

A Standards.

Q —standards?

[152] Pardon me?

MR. KEMPF: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

BY MR. EISEN:

Q Has the trend been toward more stringent standards in the control of the amount of sulfur in the coal, or in the control of the amount of sulfur oxide emissions, or both?

A I would say more stringent control of sulfur in fuels or sulfur in emissions, depending on which way they write the regulations, but it means more stringent control anyway.

Q Maybe I didn't—I know that my question wasn't clear now.

What I am getting at: Is there a trend toward permitting the utilities, or the coal user, to use high-sulfur content fuel, so long as he controls the emission of it? Is there such a trend?

MR. HEDLUND: Do you understand the question, Mr. Griswold?

THE WITNESS: Well, I think I have an idea of it.

* * * *

[187] Now, in terms of operating costs, the 10 [188] per cent relates to the cost of operating the power plant, and this is an additional burden, this 10 per cent, of operating costs.

MR. EISEN: I see. That clarifies it. Thank you.

BY MR. EISEN:

Q In figuring operating costs, on page 43 there is a table, Table 5, which is headed "Projected Costs for 800 Megawatt Flue Gas System."

Did you calculate, or is it possible to calculate, what the cost per Btu for these various techniques would be, based on the figures that are present on Table 5?

Did I say cost per million Btu? That is what I meant to say.

A This is cost per kilowatt potential produced, and we didn't calculate—

These figures here, Mr. Eisen, came from the individual developers of control equipment. I would consider them quite conservative, because probably by the time these go on stream, you know, and all the developmental work is done, and application, it would be much more than this.

These figures which were taken, like [189] Combustion Engineering—the alkalized alumina adsorption of the Bureau of Mines, this has been dropped completely now. They are no longer funding this.

And Monsanto, these are Monsanto's figures; and these are Wellman-Lord's figures.

Q By "these," you mean Nos. 4 and 5 are Monsanto's and Wellman-Lord's?

A That is right.

Q But how about No. 1, "Limestone Injection"?

A I don't recall where we got that.

THE WITNESS: Do you remember, Mr. High?

MR. HIGH: I do not. I am sure it would have come from the TVA report that we referenced earlier. I don't know of any other reference that would have gotten into that kind of cost detail.

BY THE WITNESS:

A The TVA is the one that has gone into all of the dolomite limestone research work, both wet-scrubber type and the dry-particle type, where they take the particulated out with electrostatic precipitators.

• • • •

[211] CROSS EXAMINATION

BY MR. KEMPF:

Q Mr. Griswold, I now hand you what has been marked as Griswold Deposition Exhibit 2, and I ask you if I have correctly identified the document.

A Yes, you have.

Q Is that the report which you prepared concerning this case?

A It is the report we prepared for you.

Q And is that the report which we have been discussing today?

A Yes, it is.

Q Mr. Griswold, are the opinions and conclusions reached in this report true and accurate to your best knowledge, information and belief?

A Yes, they are.

Q Do you personally, and the organization of which you are President, SEDRA, stand behind the opinions and conclusions reached in this report?

A Yes, we do.

Q During the course of your examination by Mr. Eisen, you mentioned that you had consulted with the Antitrust Division of the Department of [212] Justice concerning some automobile pollution control equipment.

You discussed this rather lengthily, but you mentioned very briefly the fact that you had also been subpoenaed as a witness in the El Paso Divestiture case. Was that subpoena by the Department of Justice?

A Yes, it was, as a Government witness.

Q Were you subpoenaed to testify concerning air pollution matters?

A Yes. In connection with natural gas usages in Los Angeles. However, I should add, to save people looking up the record on this: After spending two days in Salt Lake City, the Department of Justice attorneys decided it wasn't worthwhile going any further with the testimony because they felt that the Judge had made so many errors in procedure, admission of evidence, and other errors in the case, that whatever decision he came

up with would be reversed, so they were just going to appeal it.

Q During your direct examination, you discussed some of the breakdowns for the preparation of the report and some of the steps taken. [213] I have a few additional questions in this regard.

First, and Mr. Eisen may have covered this already, regarding the various existing legislation and proposals concerning new or revised legislation which is being considered.

Did you contact various state and local Air Pollution Control Officials so that you would be sure that your information was the most up-to-date available?

A Yes, we did. And to maintain liaison so that any pending legislation or action would be reported.

MR. EISEN: Are you meaning the organization, or Mr. Griswold?

THE WITNESS: The organization, it should be.

MR. EISEN: I think the record will show that Mr. Griswold did not contact them.

BY MR. KEMPF:

Q By "you," I was referring to SEDRA.

A Yes.

Q In connection with the preparation of the report, did you contact the various manufacturers of the five processes discussed in Part II C of the [214] report?

A We did, or people having cognizance and knowledge of the procedure, including TVA and NAPCA.

Q Were on-site inspections made of some of the processes in connection with the preparation of this report?

A Yes, they were. Not all, but some of them.

There are some processes there where you had to—in the case of Wellman-Lord, where the process was classified and you had to sign a document not to reveal anything in regard to it, in order to see it, so as we couldn't do this, we didn't see that.

Q You said you also discussed these processes with officials at NAPCA?

A That is right.

Q You mentioned this morning that the Federal amount of money budgeted for research into possible means of limiting the amount of sulfur emissions from various coal-burning facilities was currently approximately 15 million dollars per year.

A That is right.

[215] Q On page 43 of Griswold Deposition Exhibit No. 2, there is a table entitled "Projected Costs for 800 Megawatt Flue Gas System."

I notice that the Monsanto system, for example, the cost of putting that system on one facility would substantially exceed NAPCA's entire budget for this area for an entire year, is that correct?

A That is correct.

I think I also mentioned that about 20 million dollars is probably a very conservative figure, that this figure would undoubtedly be higher at the time of its construction if present trends continue, plus undoubtedly some problems will require, such as corrosion, more expensive materials.

In connection with the 15 million dollars, I would like to add one thing: I think this is an appreciable sum as compared to what has been spent in the past. However, it is obvious from such a comparison as this, that it isn't the kind of an expenditure alone, unless this were considerably supplemented by other funds, where you would expect a crash program on developing effective flue gas [216] control system.

MR. EISEN: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

MR. KEMPF: I will indicate for the record that when I was referring to the cost, I was referring to the capital cost alone, as set forth in the middle column on page 43.

MR. EISEN: Thank you.

BY MR. KEMPF:

Q This morning, Mr. Griswold, you said that you would be optimistic also, concerning the timetable for

the development of desulfurization techniques if you were in Dr. Middleton's job. What did you mean by that?

A I meant that if I were the administrator of that program and had the responsibility for supporting such a program and for appropriation committees on either side, that I would be inclined to be as optimistic as he is.

I think this, at least as far as NAPCA is concerned, is kind of rather a built-in deal.

* * * *

[219] Q Turning to the Nomograph on page 15 of the report, you indicated during your direct exam- [220] ination that this was developed by Mr. High. When was this developed?

A I believe I said that it was developed in connection with the "Three Cities Sulfur Dioxide Study," in connection with the sulfur levels for New York, Chicago and Philadelphia.

Q This is when both you and Mr. High were with NAPCA?

A Yes. This was when I was supervising the development and implementing the control of the Federal Facilities Program, and Mr. High was on the staff, with full responsibility for this study.

By "this study," I mean the "Three Cities Sulfur Study."

Q During the course of your direct examination, you testified to a trend toward more stringent air pollution regulations.

My question is: Are you familiar with any area where the legislative or Air Pollution Officials have enacted air pollution regulations which were less stringent than existing regulations?

A In other words, where they liberalized their regulations?

[221] Q Yes.

A No, I don't.

MR. KEMPF: I would like to have the Reporter identify, as Griswold Deposition Exhibit No. 3 for identification, a report of the Secretary of Health, Education,

and Welfare to the Congress of the United States, entitled, "Air Pollution by Federal Facilities," and dated January 1968.

(The document was thereupon marked Griswold Deposition Exhibit 3 for identification, 8-19-69.)

BY MR. KEMPF:

Q I now hand you what the Reporter has marked as Griswold Deposition Exhibit 3 for identification, and I ask you if I have correctly identified it.

A Yes, you have.

Q Are you familiar with that report?

A Yes, I am. This was prepared under my direct supervision when I was in charge of the Federal Facilities in the Air Pollution Control Program.

[222] Q Are the opinions and conclusions and statements in this report true, to the best of your knowledge, information and belief?

A Yes, they are.

MR. KEMPF: I ask the Reporter to mark for identification, as Griswold Deposition Exhibit No. 4, a document entitled "Second Report of the Secretary of Health, Education and Welfare to the United States Congress." And it is entitled "Air Pollution Abatement by Federal Facilities," and it is dated January 1969.

(The document was thereupon marked Griswold Deposition Exhibit 4 for Identification, 8-19-69.)

BY MR. KEMPF:

Q Mr. Griswold, I hand you what has been marked as Griswold Deposition Exhibit No. 4 for identification, and ask you if I have correctly described the document.

A Yes, you have.

Q Are you familiar with this document?

A Yes, I am.

[223] Q Mr. Griswold, I ask you to turn to page 5 of the report. The second paragraph reads:

"A summary of these reports reveals that 442 remedial actions were reported for 387 installations, located in 45 States, the District of Columbia, Puerto

Rico, and Guam. With few exceptions, the remedial actions fall into the following categories:"

Then turning to category 4, which is entitled "Reduction of Sulfur Oxide Emissions from Heating Plants by:" I ask you what are the two remedial actions indicated.

MR. EISEN: I object to the question as not being confined to the area covered by the complaint.

MR. KEMPF: Is counsel willing to withdraw all exhibits which he is introducing, or has indicated he might introduce at trial, which contain information relating to areas outside of the Midwest?

MR. EISEN: I am just confining my objection to the form in which I expressed it.

MR. KEMPF: In light of that, I will ask [224] the witness to answer the question.

BY THE WITNESS:

A Well, it is listed here under a. and b. (Reading):

"a. Using same type of fuel but of lower sulfur content.

"b. Converting to a different fuel of lower sulfur content."

BY MR. KEMPF:

Q Does the report indicate any remedial action involving the installation of desulfurization equipment?

MR. EISEN: Same objection. The matter is not confined to the area covered by the complaint.

MR. KEMPF: Of course, Mr. Eisen, I would point out to you that the report encompasses the entire area which is the subject of the litigation, and if there were none for the entire country, I believe it is safe to assume that there were none within this area.

BY MR. KEMPF:

Q I repeat my question, Mr. Griswold, which is: [225] Does the report indicate any remedial action by Federal Facilities involving the purchase of desulfurization equipment?

A No, it doesn't.

Q Does it indicate any remedial action involving the construction of taller stacks?

A No, it doesn't.

I think I ought to make it clear, though, that upon the issue of this report I had been relieved of my responsibility for Federal Facilities by Mr. Megonnell my deputy; and since this was a report to Congress in connection with the efforts under the overall program, we couldn't go any further in connection with what actually could be done as of this period at this time, beyond the two methods that existed here, which were covered in a. and b.

MR. EISEN: Could I have that last question read, please.

(The record was thereupon read by the Reporter as above recorded.)

BY MR. KEMPF:

Q Why did you feel you could not go beyond these two methods?

[226] A Because there wasn't equipment developed to a point where they could be physically applied.

Q Turning to page 1 of the report, Mr. Griswold, the first sentence of the "Introduction," talks about the emphasis in The Air Quality Act of 1967 on Federal leadership in the control of air pollution.

What is the aim of this leadership?

A I think I brought this out the other day with Mr. Eisen, where I mentioned that it was expected that the Federal Government would set an example for other governmental agencies, and ultimately for industry and the citizens and taxpayers, in connection with action on air pollution control, to clean up the air pollution problems that existed, and it was felt that it would be unreasonable to expect action by other activities under the leadership of the Federal Government until they cleaned their own house, and this program was designed with that purpose in mind.

• • • •

[239] Q To what extent were they adopted?
[240] A State-wide.

MR. EISEN: Excuse me. I renew my objection to the line of questions as being irrelevant and immaterial to the issues in this case.

BY THE WITNESS:

A They were adopted state-wide in New Jersey for the northern and southern portions, with the exception of, I think, three counties on the sea coast and three in the mountainous area.

BY MR. KEMPF:

Q Do you anticipate state-wide regulations in other areas?

A I believe that you are going to have state-wide regulations similar to those, generally.

If you don't have a state-wide regulation, you are going to have industries moving out into the rural areas, the less urbanized areas, and subsequent dislocation of your industrial developments. I feel that this probably won't be acceptable from the standpoint of the area that is losing the industry because of the severity of their controls, plus the fact that you will see a wide range of local regulations which are designed to keep areas, which are now clean, from being polluted. And there is a potential, if you [241] don't do this, of having in the one state many different standards and regulatory activities that could be more stringent than the state standards set for the Air Quality Regions, because of the fact that there will be developed a local non-degradation of the atmosphere tendency trend.

Q Are your comments applicable to states throughout the Midwest?

A I think the same thing would apply in any state. I think it is logical that people who have what they consider to be a very nice, clean place, from an air pollution standpoint, in which they live, not to want to see this deteriorate.

MR. KEMPF: I have no further questions.

REDIRECT EXAMINATION

BY MR. EISEN:

Q Referring to Griswold Deposition Exhibit 2 for identification, the title of that document contains the phraseology, does it not, "Prepared for Kirkland, Ellis, Hodson, Shaffetz & Masters, Prudential Plaza, Chicago, Illinois, Re: United States v. General Dynamics et al"?

A Yes, it does, Mr. Eisen.

* * * *

[260] Q Since the fall of 1967, has the Antitrust Division of the Department of Justice had the benefit of your views concerning air pollution matters in connection with the automotive proceed- [261] ing?

A Yes, they have.

Q How recently have you discussed air pollution matters with the Antitrust Division of the Department of Justice?

A I would say probably within the last four months, with Mr. Bernard Hollander, who now has the assignment of this case under Mr. McClaren.

MR. KEMPF: I have no further questions.

REDIRECT EXAMINATION

BY MR. EISEN:

Q In that connection, your association has been confined, has it not, to the emissions from automobiles?

A No. It has been in connection with—I have no objection to telling you about it.

Q May I rephrase the question?

A Surely.

Q It has not had anything to do with coal?

A No.

Q One further question or clarification—

MR. KEMPF: Mr. Eisen, if you are going to withdraw your prior question, I intend to ask it.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF BRUCE C. NETSCHERT, TAKEN AUGUST 20, 1969

* * * *

BRUCE C. NETSCHERT,

called as a witness by the plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. FUTTERMAN:

Q Please state your name.
A Bruce C. Netschert.
Q What is your address?
A My home address is 1913 Martha's Road, Alexandria, Virginia.
Q By whom are you employed?
A I am employed by the National Economic Research Associates, Incorporated.
Q I think for purposes of future reference, we will refer to that organization as NERA, if that is all right with you gentlemen.
Would you please explain what NERA is and what are its functions?
[4] A NERA is a firm of consulting economists, whose clients include both private industry and various Government bodies. Three major areas of specialty are utility economics, antitrust economics, and the economics of energy and minerals.
Q These three groups that you just mentioned, are these areas of special interest for NERA?
A They are of special interest, and also they constitute the major portion of our work, of our business.
Q Would you please give us briefly your educational background?

A I received a B.A. degree in Geology from Cornell University in 1941, and a Ph.D. degree in Economics, from Cornell University also, in 1949.

Q For how long have you been employed by NERA?

A Since 1961.

Q And briefly, what was your employment experience prior to 1961?

A After receiving my Doctor's degree I taught for a year and a half, Geology and Economics at the University of Minnesota, Duluth Branch.

[5] I then came to Washington, and for a period of five years I served consecutively with the Bureau of Mines, the President's Materials Policy Commission, the National Resources Security Board, and the Office of Defense Mobilization, and my final Government position was with the Central Intelligence Agency.

Following that, I took a position on the staff of Resources for the Future, Incorporated, which is a Ford Foundation-sponsored educational foundation in the field of natural resources, conservation, and was with them for five years prior to my joining National Economic Research Associates.

Q Would you list for us some of your publications?

A I am the author of "The Future Supply of Oil and Gas," and the co-author of Atomic Energy Applications with Reference to Underdeveloped Countries"; "Energy in the United States Economy, 1850-1975"; and "The Future Supply of the Major Metals." These are the books which I have written or have been co-author of. In addition, I have many publications of articles and speeches and chapters in books.

[6] Would you list for us some of the major articles that you have written which deal with energy fuels?

THE WITNESS: May we go off the record for a minute?

MR. FUTTERMAN: All right.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

BY THE WITNESS:

A I shall provide you a copy of my biblography in answer to that question.

MR. FUTTERMAN: Thank you.

MR. HEDLUND: I might add, though, at this point, that the biblography does not have a breakdown, does it, of articles relating to energy fuels as opposed to other topics?

THE WITNESS: No. It is a complete biblography, but from the titles it would be apparent which are relevant and which are not.

BY MR. FUTTERMAN:

Q Dr. Netschert, I understand that you [7] are going to be a witness in the case of United States versus General Dynamics Corporation, et al., is that correct?

A That is correct.

Q And you have prepared a report and some charts in connection with that testimony, is that correct?

A No, that is not correct wholly. I have prepared a written summary of my expected testimony, together with supporting tables and charts, but I would not call it a report.

Q Have you had any prior experience or have you testified in any other cases on the subject of energy fuels?

A Yes, I have.

Q In which cases?

A Well, I have testified before the Federal Power Commission since 1961 in every one of the so-called Area Rate Proceedings, having to do with the regulation of the field price of natural gas, and I have also testified in connection with certain pipeline applications for that same body.

I have testified in Federal Court on various matters, all involving energy companies, [8] and I have testified before Congressional hearings and departmental administrative hearings on energy matters.

Again, I could supply you with a list of these, if you desire.

Q Yes. I would like such a list.

Does the summary of testimony that you prepared, and of which we have received a copy, contain a summary of all the testimony that you are expected to give in the case of United States versus General Dynamics, et al.?

A Yes, I believe that is correct, in the sense that all of the points, all of the conclusions that I would expect to draw, are contained in this document.

MR. HEDLUND: Not to mislead the Government, I want to point out that we may ask Dr. Netschert at trial to comment upon some of the testimony to be adduced by the Government. This of course would be in the nature of rebuttal testimony rather than as in our case in chief.

BY MR. FUTTERMAN:

Q Dr. Netschert, I would now like to direct [9] your attention to the part of the summary of your expected testimony entitled "Interfuel Competition." I believe that is page 1 of the total summary.

I would like to specifically direct your attention to the first sentence, in which you say:

> "In the period since World War II coal has been a decreasingly effective competitor in the following markets: railroads, home and building heating, and industrial users of fuel for heat and electricity generation."

I ask you: What do you mean by the phrase "decreasingly effective competitor"?

A I mean by that to describe the inability of coal to maintain its position as the dominant fuel in these use categories. At the beginning of the period it was in such a dominant position, and over the course of the period this position has either disappeared entirely in certain instances or has been seriously eroded by the encroachment of competing fuels.

• • • •

BY MR. FUTTERMAN:

[10] Q Isn't it true that there are very few [11] coal-burning locomotives still in operation in the United States today?

A That is correct, and that is an instance, I would say, in which they were doomed no matter what they tried.

Q In the home and building heating market, how has the coal industry tried to maintain its market?

A They cooperated with the furnace manufacturers in developing stokers and other equipment and improving the performance and design of home furnaces to make them more attractive to the user, and this represented a deliberate and conscious effort to preserve what they could of that market.

Q When did these efforts take place?

A They took place I think mostly in the early part of the period since World War II.

Q Are these trends also true for the Midwest, as you have used that term throughout your report?

A Yes. I would say so.

* * * *

[13] Q The decline of coal's position in the railroad market and the home and building heating market and in the market for industrial users of fuel, and the fact that coal's position in the [14] utility market is increasing, or the fact that the utility market is now the mainstay of the coal production, as you put it.

A If I can take each of these individually.

Q Yes.

A I would not expect a continuation of the past trend in the railroad market because there is no market left for it; therefore, that is a finished chapter.

I would expect a continuation of the decline of coal's position in the home and building heating market, and also in the industrial use market.

As for the utility market, I would expect that coal's present dominant position in that market would be increasingly eroded by nuclear energy. I would not expect that the past encroachments of the hydrocarbon fuels would continue at the same rate and to the same degree as has been true over the past decade or so.

Q In the second paragraph on the first page of the summary of your expected testimony, you state "This is demonstrated by the attached tables."

[15] Which of the attached tables were you referring to for support of the statements made in the first paragraph?

A Table 2, Table 3, Table 4, Table 5, Table 6, Table 9, Table 10, Table 11, Table 12, Table 13, Table 14, Table 15. I believe that is it.

MR. HEDLUND: May I have those Tables back, please.

A (Read by the Reporter.)

BY MR. FUTTERMAN:

Q Directing your attention now to Paragraph B on page 1, and specifically directing your attention to the second sentence in that paragraph, which states:

> "The utility market is predominant, but in this as well as all other markets there is strong competition from the other fuels."

Would you please explain what you mean by the phrase there, "strong competition from the other fuels"?

A I mean by that that either a competing fuel is actually taking business away from coal producers or it is in a position to do so if cer- [16] tain changes in relative prices and other market considerations were to occur. In other words, it is either an active competitor or a latent competitor.

Q In your opinion is gas one of the fuels that would be either in the position of an active competitor or a latent competitor?

A Yes, it is.

Q What about the same in respect to oil?

A Let me make sure what we are talking about. First, we are talking about the Midwest as I have defined it.

Q That is correct.

A Second, we are talking about the utility market only.

Q That is correct.

A The position of oil relative to the positon of gas, I regard it as a less serious competitor in this area and in this market category.

Q Would you please tell us the basis for your statement, first in connection with gas, and then the basis for your statement in connection with oil?

MR. HEDLUND: I am not quite clear what—

[17] Well, may I have his two statements back.

You are talking about his prior answer?

MR. FUTTERMAN: That is correct.

(The record was thereupon read by the Reporter as above recorded.)

BY THE WITNESS:

A I think, really, I can answer it best if I take them together.

The major basis for the distinction I make between the position of the two of them is the matter of relative availability. We are talking here about the use of residual fuel oil, the heavy fuel oil, by utilities, and the availability of that is completely limited by the capacity of the local refineries—that is, the refineries within this area or continguous to it—to produce this material. The long-term trend in this country is away from the production of this material, and the middle portion of the United States is one of the areas in which this has proceeded farthest. The nature of resid is such that its inland transportation is severely limited in distance, and in fact it can be trans- [18] ported at all only on water. This means, then, that not only is the fundamental supply of it limited by a lack of productive capacity, but that its market area from any given source is further limited by transportation problems.

Now, gas doesn't suffer from this, in the sense that it depends on the productive capacity of a processing facility. Its limitation is solely in terms of the quantity that has been discovered and developed and the transmission capacity to bring it to the place where it can be burned. This limitation I consider to be of a wholly different order of magnitude compared with the limitation surrounding the supply of residual fuel oil.

One further point is that the use of gas by utilities has fitted very well into the marketing activities and structure of the gas industry by enabling the pipelines and distributors to maintain their use factor at a high level—I am referring to the interruptable use of gas, in other words—

and this has been one of the reasons for the increase in the use of gas by the utilities, and the larger availability of [19] gas in general means that it is there, potentially for further use by utilities.

BY MR. FUTTERMAN:

Q At the present time would there be any problems of transmitting the required amounts of gas which would be necessary to serve Midwest utilities, should Midwest utilities currently consuming coal decide to switch to gas?

MR. HEDLUND: I am going to ask, Mr. Futterman, and perhaps this is an appropriate time to do it, what we are talking about in terms of "the Midwest." Are you referring, since Dr. Netschert has referred to what he means by "the Midwest" as being from what the Government has provided us in terms of a description of the Midwestern States or the alleged Eastern Interior Coal Province and the Eastern Interior Coal Sales Area.

I think it might be helpful at this point, if we are going to use "Midwest," to refer to those states, to have an identification of those spread upon the record so that we can all be certain what [20] we are talking about in terms of "the Midwest."

* * * *

[22] MR. FUTTERMAN: Now, I am sure everyone has lost sight of my original question. Will you read it back, please.

(The question was thereupon read by the Reporter as follows:

"Q At the present time would there be any problems of transmitting the required amounts of gas which would be necessary to serve Midwest utilities, should Midwest utilities currently consuming coal decide to switch to gas?")

BY THE WITNESS:

A If all of the present coal consumption by Midwest utilities were replaced by gas, the situation would be an impossibility; that is, it would call for the delivery of so much gas that it would exceed the capacity of the existing pipelines.

BY MR. FUTTERMAN:

Q So then is your testimony that it would be impossible for all of the Midwest utilities currently consuming coal to immediately convert to gas?

A An overnight conversion would be impossible, [23] yes.

Q Do you have an opinion as to how long it would take to construct sufficient pipeline facilities to accommodate such a changeover?

A Normally, it could be done within a year.

Q Do you think that there are sufficient reserves of gas available at the present time to permit such a changeover? And I am speaking now only of the Midwest.

A May I ask how you are using the word "reserves"?

Q Well, that is a very complicated term, Dr. Netschert, as you so aptly described it in one of your books.

I think, for purposes of this question, I would define "reserves" as quantities of gas available, known to be available at the present time, for consumption purposes.

MR. KEMPF: May I have the original question read back, please.

(The question was thereupon read by the Reporter as follows:

"Q Do you think that there are suf- [24] ficient reserves of gas available at the present time to permit such a changeover? And I am speaking now only of the Midwest.")

BY THE WITNESS:

A Yes, as you have defined it.

BY MR. FUTTERMAN:

Q Would that require certain consumers of gas in other areas of the country to be without sufficient quantities of gas to meet their consumption requirements?

A In the terms in which you have posed the situation, I do not believe it would.

Q When you speak of utilities consuming gas, are you speaking of interruptible gas or firm-rate gas?

MR. HEDLUND: May I have the last question, please.

heating market, would not the gas distributor be hurting its competitive position in the home heating market?

A The answer is that the circumstance you pose is self-contradictory and totally unreal, because gas sold on an interruptible basis has no effect on the supply available in the home heating market, because the very interruptibility is a recognition of the fact that the home heating market has priority, and it does not affect the amount going to the home heating market. When the home heating market needs it, in periods of peak demand, the gas to the utilities is cut off, and that is the interruption.

* * * *

[38] Q Do you have an opinion as to whether or not nuclear energy eventually will displace coal entirely as an energy source for Midwest utilities?

A Yes, I do.

Q What is that opinion?

A I believe that eventually it will.

Q When will this take place?

A I think the answer to that depends, more than anything else, upon the date of the perfection of the commercial breeder reactor.

Q And why is that displacement dependent upon the date of the development of the breeder reactor?

MR. HEDLUND: May I have that question, please.

Q (Read by the Reporter.)

MR. HEDLUND: By "that displacement," you are referring to the complete displacement?

MR. FUTTERMAN: Of coal by nuclear energy.

BY THE WITNESS:

A Because it is only with the breeder reactor that nuclear power will be able to capture [39] the real cost savings that are inherent in nuclear energy, in nuclear power generation.

The very large increase in efficiency of the breeder reactor compared with the present generation of burnerupers, plus the substantial credit for the fuel created by the reactor, plus, still further, its even greater economies of scale, all mean that for nuclear power to attain absolute dominance it will have to be through the breeder re-

actor and not through the present reactor designs and technology.

BY MR. FUTTERMAN:

Q Is it your testimony, then, that the present nuclear reactors being placed into operation and on order for the next ten years or so will not be capable of completely displacing coal as an energy source for electric utilities in the Midwest?

A They very definitely will not. I think that in each instance, that is, for each plant added to the systems in that area, it will be a question of a specific decision between the nuclear route and the fossil fuel route, and some of those will go nuclear, and some will go fossil fuel.

Q And these plants of which you are speak- [40] ing, these are plants which will be placed into operation to complement existing generating capability, will they not?

A Well, both complement and replace.

Q Do you have an opinion as to the rate of increase for electricity consumption in the United States during the next ten or fifteen years?

A Yes.

Q Would you please give us that opinion?

A I think that it will by and large continue at the long-term historical rate, which has averaged around seven per cent per annum. This is the rule of thumb in the industry.

Q Do you believe that trend will be prevalent in the Midwest?

A I see no reason why it should be significantly different. No reason why it should be precisely seven per cent, either, but—

Q Do you have an opinion as to whether or not coal consumption by electric utilities in the Midwest will increase or decrease or stay about the same during the next fifteen years?

A I think it will increase, but at a slower rate than it has been increasing in recent [41] years.

• • • •

[43] Q Are there any estimates as to whether or not the appropriate geological conditions exist in the Midwest for using geothermal energy to generate electricity?

A There are no appropriate geological conditions for surface manifestations to appear. The closest such manifestation is at Hot Springs, Arkansas. But the known geology does not preclude the occurrence of such subterreanean geothermal energy at greater depths than have been probed for oil and gas in that area.

Q Would it be your testimony that at the present time geothermal energy cannot be considered a competitor of coal in the Midwest for purposes of generating electricity?

A Yes.

Q Would you briefly explain the concept of pumped storage?

A Pumped storage is the use of two reservoirs at different elevations and the mov- [44] ing of water between them. The reservoirs can be either natural or artificial.

During the off-peak period in electricity demand which occurs every night, the excess capacity of a power system is used to power pumps which pump the water from the lower reservoir to the upper reservoir, and then during the peak demand periods of the daytime, this water falls back down to the lower reservoir, and in the same machines which did the pumping, generates electricity as in the normal hydro operation.

Q I will come back to that later.

I would now like to direct your attention to paragraph B on page 2, and the first complete sentence appearing on page 2 states:

> "Through the technique of 'total energy' or on-site generation gas is definitely a competitor and oil may be."

Would you please explain what you mean by that sentence?

A I mean by that that the gas industry is engaged in a highly aggressive promotion campaign to get total energy installations throughout the country. This cam-

paign takes many forms and in- [45] volves a good deal of money and many companies in the industry. In contrast, the oil marketing end of the industry has been comparatively passive. It is just as feasible, it makes just as much economic sense, to use oil as the energy source as it does gas, but the oil industry has not been as aggressive in marketing, and that is what I meant by comparing one as definitely a competitor and oil may be, in the sense that any time they get the idea that they can make as much out of this as gas, they can go ahead and do it.

Q I think it might be helpful if you would explain what you mean by the term "total energy."

A Total energy is the term used by the gas industry to refer to the same thing that the electric industry calls "on-site generation."

This is the installation of a generating unit at the site of consumption, which may be an apartment house, a motel, a school, a shopping center, any energy user of that type. The installation satisfies all the electricity requirements of the complex that it serves. The waste heat from the turbine for the deisel engine that drives the generators is used for heating and cooling, [46] both space heating and refrigeration and water heating, supplemented, if necessary, by direct use of the fuel for this purpose, so that the total energy needs of the complex are satisfied by this installation; hence the name.

Q Are there any facilities in the Midwest which use coal for purposes of on-site generation?

A I know of none in the United States or anywhere else.

MR. HEDLUND: May I have that question and answer back, please.

(The record was thereupon read by the Reporter as above recorded.)

THE WITNESS: Can that be physically struck? I just misunderstood your question.

MR. FUTTERMAN: Just elaborate on your answer.

BY THE WITNESS:

A I misunderstood your question, and the answer should be:

Yes, there are. There are no total-energy installations that are fueled by coal, but there are industrial installations which generate their own electricity with coal.

* * * *

[52] MR. FUTTERMAN: I will rephrase the question.

BY MR. FUTTERMAN:

Q Do you know what percentage of the total electricity generated in the United States is accounted for by the use of the technique of total energy?

A I do not have the figure, but I know that it is a very small percentage.

Q Would that percentage hold true for the Midwest States?

A I have such a figure in one of my exhibits.

Q Yes.

A And again, it is small.

Q I direct your attention to the first complete paragraph on page 2, which is still part of the subheading B, which states:

> "In sum, the competitive situation within the energy markets as a whole is already more fluid than it has ever been before and will [53] become still more fluid in the future."

Would you explain what you mean by that, sir.

A I mean that the competition is today more severe, more keen, among the fuels and between the fuels and electricity, and that the intersubstitutability is also greater than it has been before, and that both this competition and this intersubstitutability is likely to increase in the future, that the choice facing the consumer is wider than ever before and will become still wider.

Q By use of the word "consumer," do you include therein electric utilities?

A No. I meant the ultimate consumer of energy, that is, the consumer of energy either as electricity or as fuels.

Q Well, do you consider electricity to be a primary source of energy?

A No. It is a secondary source, or it can even be a tertiary source.

Q What do you consider to be the primary sources of energy?

A The primary sources are the fuels, hydro- [54] power, solar energy, geothermal, tidal, and such.

Q So that when you were speaking of competition between primary sources of energy, this is different than the competition that exists at the secondary level of energy consumption, is that correct?

MR. HEDLUND: May I have that back, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A Well, I had not employed this distinction between primary and secondary in either the summary of my expected testimony or in any of the tables. I had used the term, I believe, "interfuel competition," and by that I refer to two things at one and the same time: First, interfuel competition senso stricto, that is, competition among the fuels; but also competition between the fuels and electricity. If you want that put now in terms of primary and secondary sources, it embraces both at the same time.

* * * *

[68]

DIRECT EXAMINATION
(Continued:)

BY MR. FUTTERMAN:

Q Dr. Netschert, do you have an opinion in regard to the role that mine-mouth generation plants will have in permitting utilities to cope with air pollution controls?

A Yes.

Q Would you state that opinion for us, please.

A I think that in the immediate short term the ability to site new stations at the mine mouth rather than in the load centers would tend to relieve the pressure on the utilities with respect to sulfur limitations, because of the present status of such regulations in concentrating on metropolitan areas. However, I also think that the clear tendency is toward the eventual adoption of such metropolitan standards as state-wide standards, so that in the longer term this will have no helpful effect.

[69] Q When you speak of state-wide standards, are you including in that statement sulfur limitations of the coal being burned?

A That is what I had in mind, yes.

Q Dr. Netschert, do you have an opinion as to whether or not the impact of measures to abate air pollution can be translated into decreases or increases of consumption of the various fuels by electric utilities?

A Yes, I do.

Q Would you state that for us, please.

A Well, as I previously indicated, I think that the impact of the sulfur aspect of air pollution regulations is to place coal at a competitive disadvantage, and this stated otherwise would mean that there would be a tendency to turn to other fuels as a means of coping with such regulations—gas, oil and nuclear.

To answer your question specifically, I would say that the net effect would be to tend toward an increase in the consumption of these other fuels at the expense of coal consumption.

* * * *

[74] Q Have you made any studies of the added costs which you expect will result from the necessity to employ particulate controls?

A No, I have not.

Q Have you made any studies as to the availability of low sulfur coal in the Midwest?

A No, I have not.

Q You say that the increasing stringency of air pol-

lution regulation over the coming decades is inevitable. What do you mean by that statement?

A I mean two things: First, it is already clear that the regulations that have been adopted to date generally contain within them a timetable which provides for increasingly severe limitations on sulfur content or on emission standards.

Secondly, it is clear, as I have said before, that I think that the metropolitan standards will tend to be adopted state-wide. For example, New York has done this, and I believe some other states, but I can't recall specifically at present.

Thirdly, there appears to be a tendency to push toward an ultimate sulfur content limitation that will be even lower than those currently provided for in regulations. For example, regula- [75] tions that currently call for .5, I would expect to see eventually going down to .3 or .37.

And finally, I believe that the increasing scale of fuel use, by everyone, not just the utilities, as part of our growth in population and economic size, will call for this action on the part of the authorities.

Q Do you expect coal to be consumed in the Midwest during the next twenty years?

A Yes.

Q Well, in view of your statements concerning the unavailability of low sulfur coal, how can coal be consumed in view of the restrictions such as the one that you have just mentioned?

MR. HEDLUND: May I have the question, please.

Q (Read by the Reporter.)

MR. HEDLUND: Are you referring, Mr. Futterman, to all statements that this witness has heretofore made on this record with respect to the availability of low sulfur coal?

I am not aware that Dr. Netschert has said that low sulfur coal was unavailable, period.

* * * *

[80] Q I now direct your attention to Part II of the summary of expected testimony, entitled "Structural Changes in the Post-World War II Period," and I would

like to direct your attention to a statement which appears under sub-heading 1, [81] paragraph b:

> "The industrial market for coal has failed to keep pace with industrial growth."

Upon what do you base that statement?

A Well, in addition to my general knowledge, I base it on some of the tables that I have.

Q Would you indicate those tables for us?

A Yes. Table 2, Table 3, in a less direct sense Tables 4 and 5, Table 11; Table 12, Table 14. I believe that is it.

Q And I would like to direct your attention to sub-paragraph d, which states:

> "As a result of the above changes and of changes in the scale and technology of power generation, the major emphasis in coal marketing has increasingly emphasized large quantity, long-term contracts, and Btu content, chemical and physical characteristics."

Upon what facts do you base that statement?

A On my general knowledge of the electric utility industry, and on the results of the research I have done in this field, on discussions with my colleague, Mr. Gerber; and to the extent that it [82] has not been specific research, on my following of the technical literature, that is, the periodicals and professional journals concerned with the production and utilization of fuels.

* * * *

[84] Q Would you state that for us, please.

A In my opinion there is a range within which such characteristics or parameters can vary, but this is, for practical purposes, very narrow and constitutes an effective constraint on the ability of the utility to use whatever might be available purely in terms of what could be transported to it at a reasonable price.

Q In your opinion is it possible to design a boiler so that it will be able to consume varying grades and qualities of coal?

A Yes. I believe it certainly is possible to design a boiler that could burn a wide range, but I do not think

such a boiler would be suitable for utility use, or for any use in which high temperatures are employed, really high temperatures.

Q Do you have an opinion as to whether or not it is possible to adjust a boiler so that it may take types of coal that had previously been impossible to burn in that particular boiler?

A Yes. I believe that there is a certain degree of such flexibility, if you want to call it that, but again I would consider it, in my opinion, [85] to be a limited flexibility, limited both in the physical sense and in the cost sense.

Q Is it your opinion, then, that as a general rule utilities tend to design boilers that consume a narrow range of coals?

A Well, whether or not the utility designs the boiler —it might be the equipment manufacturer. But utilities tend to specify parameters, for the plants they build, that call for boilers that can tolerate only a very narrow range, and indeed it could even be only a specific coal.

Q Do you know of any specific examples where utilities in the Midwest have installed boilers which are designed to take only one specific coal?

A No. I have no such specific knowledge.

Q In your opinion, do the coals in Illinois differ from the coals in Indiana and West Kentucky?

A Well, I don't know whether I would say they differ from those coals any more than they differ among themselves. There is a variation in coals even within the State of Illinois. But I would not be prepared to say that there is a certain specific difference, no. I am not that [86] familiar with the characteristics of the coals in question.

* * * *

[88] Q Isn't it true that during 1968 the quantity of gas consumed exceeded newly discovered reserves?

A Yes. That has happened before, too.

Q It is my understanding that that was the first time it had happened since the American Gas Association had been keeping statistics.

A Since 1947, that is the first time, yes.

Q And that situation has also existed in the oil industry for some four or five years, has it not?

A Well, there has been a more or less rough balance between annual consumption and annual addition to crude reserves in oil.

Q Directing your attention to page 4 of the summary, what do you mean by the phrase, "a substantial increase in scale," which is contained in the sentence carrying over from page 3 and concluding at the top of page 4?

A Part of the basis for that—which is what I think you want, isn't it, the basis for it?

Q Yes. The basis for it, and also what you mean by it.

A Well, to answer both at once, Table XXVI shows the average production per mine for all mines [89] of 500,000 tons of production or more, and for the 50 largest mines.

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY THE WITNESS:

A (Continuing) This shows, in terms of the index numbers, in Columns (4), (5) and (6), that all mines, on the average, have increased their production by something more than 30 per cent, comparing the begining and end years, just for convenience; that the mines producing 500,000 tons or more have increased their production by something approaching 40 per cent; and that the 50 largest mines have almost doubled the size of their average output over the period. Now, I consider such changes to be substantial.

In addition, the announcements and figures describing the scale of the new large mines being put into production currently or in the next few years, shows that they are in some instances larger than any other mine ever put into production in this country, and in general at the very top end of the size scale. I interpret this, [90] to me it means, that there has been a substantial increase in general in the scale of coal-mining operations, and that it has been concentrated at the highest end of the size categories.

BY MR. FUTTERMAN:

Q This chart, of course, covers the United States as a whole, does it not?

A That is correct.

Q And there would be no way by which you could make any determinations with respect to Midwest mines by an analysis of this chart, isn't that correct?

MR. HEDLUND: May I have the question, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A That is correct. Referring to this chart alone, you could not deduce anything specific about the Midwest.

* * * *

[92] Q How would you define the difference between reserves and resources?

[93] A Well, here the significant difference is whether or not they have yet been discovered.

Q And resources have not yet been discovered?

A Yes. There is a further distinction, too, but the significant one here is that.

Q Directing your attention to page 1 of the report, in paragraph B you state that, "nuclear fuel . . . will constitute an evermore serious competitor in the coming decade." On what do you base that statement?

A Well, on two things: One, now that its commercial feasibility has been demonstrated; that is, now that nuclear plants have been in operation, have been on line, and have been fitted into the operations of electric systems, the utility industry has the confidence that is necessary for a a wide-spread adoption of such a completely new technology. Therefore, compared to what it has been, the use of nuclear power would naturally then be greater.

Secondly, I think that small-scale individual refinements in nuclear technology should help in obtaining reductions or in fore- [94] stalling increases in nuclear power costs, which should enhance the competitive position of nuclear power in general; that is, it is a new technology, and being a new technology the opportunities for improvement in it are greater than they are in, say conventional power

technology, which has some eighty years of history, and a good deal of the big gains possible there, in conventional technology, have already been milked.

Q In your opinion have we had sufficient performance experience to know what to expect from nuclear generating stations in terms of their operating performance?

A We have, in this relatively small size of the initial generation. By "generation" here, I mean time, vintage of plants.

We have not yet had such experience, no, with the new larger size units that are now being constructed or ordered.

This is, again, one of the reasons why, as I said earlier, I think that in each instance it will have to be a choice made between the two for each particular plant that a utility wants to build. They cannot take it for granted that if [95] they go the nuclear route they will come out ahead.

Q Well, before we have such experience, in your opinion can we estimate whether or not the competition of nuclear fuel with coal will be sufficient to hold the growth rate in coal during the next ten or fifteen years?

A Do you mean to hold down the growth rate of coal?

Q Yes.

A Yes, I would say so, for this reason, that that well might not be true if that were the only element present, but when you combine it with the air pollution pressures, I think that it tends to offset this disadvantage, so to speak, of the lack of operating experience.

The utilities are being pressured in this direction, too, you see. By the air pollution regulations they are being pressured toward the nuclear side.

Q Well, won't the utilities be faced with polution problems caused by the discharge of heat into the water when nuclear plants are constructed?

A Most assuredly; exactly that.

What they do, it is a sort of frying pan- [96] into-the-fire business.

• • • •

[97] Q Well, if the functional breeder reactor is not available, let's say until beyond 1990, will this cause any problems to the use of nuclear fuel as a source for generating electricity?

A It could, yes.

Q And is that because of the fact that there may not be sufficient quantities of low-cost uranium available?

A That is one of the things, yes. But again, this is not an absolute fact; it is an unknown in the sense that there is at present no indication that there will be, but, again, there is no indication that there cannot be. The opinion is generally that it is unlikely to be.

Q Do you have an opinion as to whether or not the percentage of nuclear plants currently on order actually indicates the inroads or the extent to which nuclear power has made inroads on coal's markets?

[98] MR. HEDLUND: May I have that question, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A Well, to answer your question as you phrased it, the answer is yes, in the sense that every nuclear plant built can be taken to be an encroachment on coal's markets, since coal is the dominant fossil fuel; that is, we can assume that every plant that has already been ordered as nuclear will, if it gets far enough along before it is too late to cancel because of current short-term delays, will be a plant that is nuclear instead of what otherwise would have been coal.

But I think what you meant by your question was, is this an indication of the pace of encroachment we can expect in the future; because this other thing is a sort of direct conclusion.

Q That is my next question.

A The answer to that question is: I don't think it is, no. I think this was a short-term spurt at a far higher rate than is likely to prevail over the longer term. It was sort of a jumping on the bandwagon, so to speak. The result was a [99] clogging of the production facilities, and there simply must be some reaction to that, in the sense that there will be a slow-down in the next year or two, in order to get the pipeline unclogged. After that, I think there will be an increase again in the level of nuclear orders, but that rate will not be the rate that we have experienced, say in 1967 and 1968.

Q Is one of the reasons for this fact the fact that costs of nuclear plants have increased very significantly in the last year or two?

A Well, one of the reasons has been the simultaneous increase in kilowatt costs, that is, construction costs, because of the increase in the level of construction labor wages, for example, which came at the same time that we had experienced a very high interest rate, and that combination has had a deleterious effect.

It has been still further aggravated by the combination of production delays and regulatory delays at the AEC. But I think all of these things have happened to come to a head at once, and all of them will be emeliorated over the coming years; that is, I don't think we are going to see continuing high [100] interest rates, we are going to unclog the production facilities, and the AEC is simply going to have to speed up its approval process because it is now so apparent what it is doing to the industry, and —well, I can't say so much about the construction costs. They may continue to go up.

* * * *

[104] Q By "minimum specifications," you are referring to the ash content, the moisture content, the sulfur content, and so forth, is that correct?

A Yes. And in addition, if you want to broaden the connotation of "quality," such things as alkalinity and fusion characteristics.

Q Directing your attention to sub-paragraph 6, on page 4, and in particular sub-paragraph a., it states:

> "The increased competitive pressure on coal in the utility market has led to increased pressure on the railroads to offer lower rates."

What is the source of the increased pressure which you are speaking of in that sentence?

A Do you mean source in the sense of reason, or source in the sense of who puts the pressure on?

Q Who is exerting that pressure?

[105] MR. HEDLUND: Shouldn't you identify, Mr. Futterman, which pressure you are referring to?

BY MR. FUTTERMAN:

Q I am referring to the second, "increased pressure on the railroads." Who was pressuring the railroads?

A The coal producers, because the coal producers can do only so much in holding down the cost of their product in the face of the increased wages, the wage bill they have to pay.

Once it leaves the mine, the delivered price is as much influenced by the transportation costs as it is by the production costs, and the railroads have as much interest in maintaining a large coal business as the coal producers have in selling coal. This has been pointed out to the railroads, and they have been reminded of it repeatedly and forcibly by the producers.

Q Are there any other sources of pressure which might induce the railroads to offer lower transportation rates?

A Well, if you are thinking of the railoads alone, yes, the pressure of competing modes [106] of transportation.

One magnificent example, of course, is the first coal pipeline which was put into operation in Ohio. It was a success in the sense that it delivered the coal at a lower cost than the railroad freight, and the railroads thereupon lowered their rates, under the cost of the pipeline, and the pipeline was closed.

The threat of such a pipeline from somewhere in the Midwest—I can't remember where—to the East Coast was sufficient to result in a reduction in freight rates to the East Coast.

But in the more conventional sense, where you have the alternative of barge, that constitutes pressure too.

Q Directing your attention to page 5 of the summary, sub-paragraph B on that page, in reference to the statements contained in sub-paragraph B do you have any opinion as to the minimum amount of production which would be required to open a mine in the Midwest at the present time?

MR. HEDLUND: I think I will have to have that back.

• • • •

[119] Q Now directing your attention, Dr. Netschert, to Table IV, can any generalizations be made from this table in regard to Midwest trends?

A Yes.

Q What would they be?

A That they would not be significantly out of line with the general trends shown here.

Q Well, isn't it true that the Midwest area is a greater coal-consuming region than other areas of the country, such as the far west and certain areas of the southwest?

A It is a greater coal-consuming region than some regions, yes. I am not sure it is of all regions. I don't think it would be, for example, for the Appalachia states.

But to answer your question on this table: To be sure, coal probably had a higher regional position here to begin with than it did for the country as a whole, and yet here also it suffered inroads from the hydrocarbon fuels, which is generally what this table shows, and that is [120] what I meant by saying there wouldn't be any significant difference.

* * * *

[138] Q Well, was that the only communication [139] that you had with the Federal Power Commission?

A Yes, I believe so. It was just a telephone communication.

You see, the FPC does publish figures on pumped storage projects as part of other documents, but you cannot rely on them to be absolutely complete as of the date you are looking at them.

Q Dr. Netschert, based on the statistics contained in Table XIII, do you now consider pumped storage to be in competition with coal in the Midwest?

A At present, not in any significant sense, no.

Q I would now like to direct your attention to Table XV. In connection with this, I would like to ask you what the purpose of this report is.

A Report?

Q Chart. Excuse me. Table. What is the purpose of Table XV?

Q Well, the purpose here is to show that although, as I have stated, utility use is coal's largest market and its

strongest growth market, even here the use of coal has not kept pace with [140] total power generation. In other words, the growth of coal use in utilities has not kept pace with the growth of utility output.

Q Well, wouldn't that same statement be true for the other fossil fuels?

A Over this period? Is that what you have in mind?

Q Yes.

A No, it would not be true, because there has been a great upsurge in the use of gas.

Q You are talking now in terms of an index, and isn't it true that the increase in an index—strike that.

A Well, there is another aspect, too. You are considering the competitive side, and that is one thing. One of the reasons coal hasn't kept pace over this period is because of the increased use of gas. Another reason, which would apply to gas as well as to coal, is that there has been increased efficiency in the use of the fuels, and for that reason alone it wouldn't keep pace with the growth in generation.

* * * *

[151] Q I was asking that question without reference to air pollution standards.

The question is: Are you aware of any areas in the Midwest where there are consumers who desire coal at the present time but are unable to get sufficient quantities for purposes of their [152] consumption

A No, I am not aware of it.

MR. FUTTERMAN: Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

BY MR. FUTTERMAN:

Q Dr. Netschert, I direct your attention to Table XXII, entitled "Percentage of Total Coal Production Mechanically Cleaned, and Refuse as a Percentage of Raw Coal, 1947-1967." What is the purpose of this chart?

A This is to illustrate the fact that as part of the changing pattern of coal consumption, and as part of the rise of the utility market to dominance, the coal industry

has been forced to prepare—which is the term it uses—an ever-greater percentage of the coal it markets, in order to meet the requirements of the utility market.

Q In your opinion, are significant quantities of raw coal consumed by electric utilities in the Midwest?

A I know that there is such consumption. I don't know the quantities, so I couldn't say [153] whether or not it is significant.

Q But whether or not these quantities are significant, that would not be apparent from this table, is that correct?

A That is correct.

Q Directing your attention to Table XXIII, entitled "Annual Average Value of Coal Per Ton, F.O.B. Mine, Average Railroad Revenue Per Ton, and Indicated Average Delivered Cost Per Ton, 1947-1967," would you explain for us the significance of this chart?

A The significance of this table is two-fold: First, it shows that the transportation cost of coal is a substantial portion or fraction of the delivered cost. This is not unique to coal, but it puts coal in a rather special category of basic commodities, as one in which transportation cost is so high, roughly around 40 percent of the delivered cost.

Secondly, it shows that both the coal producers and the coal haulers, the railroads in this instance, have contributed to helping to keep down the cost of coal to the user. And of course this has been an element in coal's competi- [154] tion with the other fuels.

* * * *

[156] BY MR. FUTTERMAN:

Q Dr. Nerschert, I direct your attention to Table XI—

MR. HEDLUND: We are going back to Table XI?

MR. FUTTERMAN: Yes.

Off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

BY MR. FUTTERMAN:

Q In regard to what I will call the revised Table XI, can you tell us the purpose of this chart?

A This is to give an indication of the way in which coal has suffered from competition in the non-utility market for steam coal in the eight states which we have labeled the Midwest.

The index numbers show that only in two states, in Kentucky and Wisconsin, was the level of coal use, in the non-utility consumption, higher in 1967 than it was in 1957; whereas gas is greater in every state, and that increase over the ten years has been ranged from 60 per cent to almost four times; [157] and oil has a greater consumption in 1967 than 1957 in every state but one.

So this indicates that coal has lost out, in this market, to gas and oil, in this geographic area.

Q This chart does not show tons consumed or barrels consumed or million cubic feet consumed for coal, oil and gas respectively, isn't that correct?

A That is correct. It shows only the relative changes in consumption for each year with respect to the first year.

Q Well, isn't it true that such a presentation might, in some cases, indicate a greater increase than has really taken place in terms of barrels consumed or million cubic feet consumed?

A Well, it doesn't show a greater increase; it merely shows that if the absolute level, in terms of quantities, was low in the base year, then a relatively small increase in absolute terms could lead to a relatively high number here.

That has happened, for example, with respect to Kentucky in the use of oil. We see a very marked increase in the past few years. [158] Now, this is not because Kentucky suddenly turned to oil in a great big way; it is that the consumption of oil in Kentucky in this market was, in absolute terms, relatively small to begin with.

But nevertheless, I should make one further point, and that is that over the period the total non-utility consumption of all fuels, the total of all fuels, has increased, and so coal has lost out in maintaining its relative share in that market.

Q I would now like to direct your attention to Table XII, where we once again return to total energy.

MR. HEDLUND: What makes you think, Mr. Futterman, that we have ever left it?

MR. FUTTERMAN: Well, it is hopeful that by this time we all understand what it means.

* * * *

[171] BY MR. FUTTERMAN:

Q I might add that it probably does sound familiar, because I believe you were the author of that statement.

MR. HEDLUND: Well, since you both know, it might be nice to put it on the record as to from whence it comes.

MR. FUTTERMAN: I believe it comes from page 23 of Dr. Netschert's book.

BY MR. FUTTERMAN:

Q Do you still have that opinion, Dr. Netschert?

A Yes. What I am saying there is exactly what has happened since I wrote the book, and I had forgotten that I had that opinion that far back.

The fact is that coal's total consumption has grown over this period, and it has grown because of the growth of the utility market and despite any further inroads into these other markets that gas and oil may have made.

Q Dr. Netschert, do you have an opinion as to the extent to which nuclear power plant costs have increased in the past three years?

[172] MR. HEDLUND: Are you talking nationally?

MR. FUTTERMAN: Nationally, yes.

BY THE WITNESS:

A I cannot give you a figure to quantify it, for one reason because any figure that you use could be matched against another specific figure, depending on the vintage that you take. But despite that, I would say that it certainly has increased.

BY MR. FUTTERMAN:

Q Has it increased at a rate greater than the increase in construction costs for conventional fossil-fuel plants?

A It has, in this sense, that since there is more construction involved in a nuclear plant of a given capacity than there is a fossil-fuel plant, any increase in, say construction wages, would tend to have a greater impact on nuclear plants than on fossil-fuel.

Q Dr. Netschert, is it a fact that approximately 85 per cent of the natural gas used for power generation in the United States occurs in areas west of the Mississippi River?

A That sounds like a reasonable figure, yes.

• • • •

[3]

EXCERPTS FROM DEPOSITION OF ABRAHAM GERBER, TAKEN AUGUST 21, 1969

* * * *

ABRAHAM GERBER,

called as a witness by the plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did thereupon depose and testify as follows:

DIRECT EXAMINATION

BY MR. EISEN:

Q Will you state your name, please.

A Abraham Gerber.

Q And your business and home addresses, please.

A My business address is 80 Broad Street, New York City; and my home address is 9 Harbor View Road, Port Washington, New York.

Q Have you been hired by the defendants in this case to prepare testimony to be given at trial?

A Yes. I guess the word "hired" is all right.

Q Retained?

[4] A Retained. We have been retained to give testimony.

Q You are employed by what organization?

A National Economic Research Associates.

Q When you say "we have been retained," do you mean the organization, or yourself, or do you mean you and Dr. Netschert? Which of those, or all of them?

A Well, if anyone wants our services, they come to the firm, and we were the ones who were requested to work on this particular matter, Dr. Netschert and myself.

MR. HEDLUND: If it helps, Mr. Eisen, the checks are made out to NERA.

MR. EISEN: Well, I really wasn't getting into that detail.

BY MR. EISEN:

Q What is your position with NERA?

A I am a senior consultant.

Q How large a staff does NERA have?

A Let's see. At this point there must be about sixty people, with about forty in New York, twenty in Washington, and I think there are two people in Philadelphia. It is somewhere around [5] those numbers.

Q What is a senior consultant, or what have you done while you have been a senior consultant with NERA?

A I have done a great many things: consulted with a number of utilities, done some work for a coal industry organization, worked on rate matters; and testified in several matters, one before a Federal Power Commission hearing, a Pennsylvania State hearing, and in the Philadelphia Federal District Court.

Q Do you have a list of these things you have just cited, so that we could maybe save some time?

A Well, it is not very extensive. I have only testified in three cases. I am a neophyte.

Q I mean, do you have a list of the tasks that you have carried out in behalf of NERA? You don't have a prepared one?

A No. I can tell you the three cases that I testified in, but I have never tried to make a list of the things that I have done.

Q Well, what are the three cases, sir?

A Federal Power Commission case involv- [6] ing Mississippi Power Company, in which I testified in behalf of Mississippi Power; I testified in a rate case in behalf of Philadelphia Electric Company, before the Pennsylvania State Public Service Commission; and I testified in behalf of United Nuclear, in the Philadelphia Federal District Court, in their case against Combustion Engineering.

Q What kind of a case was that?

A Antitrust. United Nuclear was seeking an injunction to prevent Combustion Engineering from exercising its rights of ownership of 23 per cent of the stock, ac-

tually seeking to get a court order to compel Combustion Engineering to divest itself of the stock.

Q Was it what is known as a Section 7 case, do you know?

A It was a Section 7 case, yes.

The Court gave a favorable decision to United Nuclear.

Q When was that case?

A I think I testified last October, and the Judge handed down his decision in—I guess it was late June, maybe May. I don't really recall [7] the exact date, but it was in the last few months.

* * * *

[9] BY MR. EISEN:

Q Anyone who operates a facility as a utility in the Midwest states of—I will extend that to Missouri, Minnesota, Wisconsin and Indiana.

A Well, I am doing some work right now for American Electric Power Company. They operate in Indiana and Ohio.

Q Are you presently doing this work for American Electric Power?

A Yes.

Q Does that involve a facility in Indiana?

A No.

Q What facility does it involve?

A It is in connection with an SEC hearing on an acquisition.

Q Not a Midwest area acquisition?

A Well, we think of it in the Midwest. It is Ohio. It is the acquisition by AEP of Columbus & Southern Ohio Electric Company.

Q What have you done in connection with this litigation to prepare for your testimony?

A Unfortunately, I just got back from three weeks away from the office, I guess it was midnight [10] two nights ago, so in the last three and a half weeks I have done nothing, or virtually nothing.

* * * *

[19] But unusual, no. I think it wouldn't be hard to find a number of plants that would be getting coal from four or five mines.

BY MR. EISEN:

Q Would it be unusual for a generating station in the Midwest area—Illinois, Indiana, Kentucky, Minnesota and Wisconsin—to be receiving coal from more than ten mines?

MR. HEDLUND: May I have that question back, please.

Q (Read by the Reporter.)

MR. HEDLUND: By that, Mr. Eisen, do you mean to confine the Midwest under those five states for the purpose of this question?

MR. EISEN: Well, I could add the states of Missouri—

BY MR. EISEN:

Q States as you have used them, and as Dr. Netschert used them in his report.

A I would be very surprised to find a plant getting coal from ten mines. There may be some. I haven't looked at every plant in the area, [20] but I would be surprised to find any getting coal from that many mines. It makes a terribly difficult administrative problem. For one thing, trying to test coal coming into the plant from ten mines would just be an awful job.

Q Would it be your opinion that they could not design a boiler to take coals from ten different mines in that area?

A Ten different mines may all have similar coal.

Q That is right.

A That is not the reason it would be unusual, primarily.

Quite apart from the possible differences in coal characteristics that might occur, the administration of ten contracts is difficult. Ten different mines would make it very difficult to take advantage of the economies of scale in transportation.

When coal comes into a power plant it gets checked for its characteristics, its Btu content, it has to be weighed. Trying to do this with coal coming in from ten different mines could create a hornet's nest in just keeping track of [21] whose coal is or is not meeting the specifications. You would get into all kinds of arguments about which coal is creating problems.

If you get difficulties with the boiler for example, and this happens very frequently, a boiler gets clogged up, the fusion temperature isn't correct. If you are getting coal from ten different mines, you would have a difficult problem trying to isolate whose coal is causing the problem so that you know to get rid of that coal or make some changes.

Getting ten suppliers for a single plant creates very difficult problems, because certainly you wouldn't want to isolate the coal piles, your storage, from ten different suppliers. It would be too expensive to maintain ten different storage piles, so it all gets mixed together and it creates problems.

Q Yes. Even when you are buying from one supplier or from one mine, you sometimes have problems—not problems, but even that one mine will have and can have different coals of different characteristics.

A It could, but at least at that point you [22] know who to go to.

Q Isn't it a fact that utilities frequently blend different coals from different sources?

A Well, you have got a lot of words characterizing it. I don't know about "frequently." But yes, utilities at a particular plant may be getting coal from two different mines or even three different mines, or four.

Q And blending it?

A Yes. They blend it.

Q And do they not also sometimes get coals from different mines and maintain separate piles?

A I don't know of any particular case, but I can think of one plant that I know of where they keep a separate coal pile for one unit of the four, because there was a series of three units built fairly similar, and then a fourth unit was built, almost as a separate plant,

with supercritical temperatures and pressures, and they had a special different kind of boiler, and there they have a separate coal pile for that one unit, but that unit is larger than the other three put together, so it is the equivalent of the whole plant.

Q Could you—

[23] A That is, you would put aside a separate coal pile for a large unit which requires a lot of coal, but if you had a small plant and had a coal pile of, oh, say 200,000 tons, it would look kind of silly, and it would be kind of silly, to have five, six, seven, eight different coal piles, one for each unit, or one for each supplier.

Q So that in general, the coals are commingled as they come in, or at least there is no effort made to keep separate piles for different generating plants?

A Oh, they definitely have separate piles for different generating plants.

Q I don't mean that. I mean, as the coal comes in, it is not segregated by source for a particular plant; it is blended together, is it not?

A I would say generally that is the case.

Q One of the references that you referred to is "Blauvelt, H. W., 'The Future of Coal as a Major Source of Energy.'"

A Yes.

Q Who is this individual?

A Blauvelt is Executive Vice-President of [24] Continental Oil.

* * * *

[25] Q It is not your testimony, I take it, that [26] the coal industry is presently in difficulty finding markets for its coal.

MR. HEDLUND: May I have the question back, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A If by that you mean the coal industry is not having difficulty disposing of its present level of production, no, it is not. Most of it is committed under long-term contract.

If you mean they are having difficulty or can expect to have difficulty expanding that production continuously and significantly year by year, yes, I think they are going to have difficulty.

The fact that Commonwealth Edison is already on line or under construction with enough nuclear capacity to account for somewhere, as I recall, between a third and forty per cent of its total capacity by the mid-1970's, is very sobering for the coal industry.

BY MR. EISEN:

Q Do you know whether or not Commonwealth Edison has any new coal plants on line?

A Oh, sure. They are building one now be- [27] cause there was a capacity problem and they couldn't count on delivery of the nuclear capacity on time, so they decided to build a coal-fired plant, but that doesn't mean they won't continue to build nuclear plants.

Q Couldn't you make that generalization about nuclear plants, that they are not ready on schedule?

MR. HEDLUND: Pardon me. May I have that question back?

Q (Read by the Reporter.)

BY THE WITNESS:

A No. I can make the generalization that those that have been delivered to date, which is, I think somewhere around two and a half million kilowatts of capacity out of the seventy-five million, roughly, on order, haven't been delivered on time, but I really can't generalize about what is going to happen to the other seventy-odd million kilowatts that are being ordered or constructed.

* * * *

[41] Q When do you expect, or do you expect, that the coal industry will die?

A I can give you a better guess about the average life span of, say, a group of people in this room, but I wouldn't venture a guess on the death of the coal industry. I don't know if it will ever die. Things happen, things change. You have to be very brash to forecast what will happen ten years from now, let alone fifty years or a hundred years from now. It is possible all kinds of things can happen.

Q Isn't it a fact that the known coal reserves are the only energy-fuel reserves in this country which we know extend beyond several decades?

A Well, facts are peculiar things. I wouldn't accept that as a fact. It is almost meaningless to talk about coal reserves extending beyond several decades.

Are you talking about coal reserves that are a thousand feet below ground and eighteen inches thick?

Q Well, yes.

A They are coal, but for all intents and purposes they are not very useful now. It would [42] raise the cost of fuel so much that it would change the whole—

* * * *

BY MR. EISEN:

[52] Q Well, what is your view of that, his statement, his title, or whatever you want to call it, or my statement, that over half U.S. generation will burn coal through 1980?

A I used to make these forecasts pretty regularly, Mr. Eisen, but I haven't looked at it to try to revise it, in light of more current information, in about three or four years.

I would say that coal probably will account for, if I had to make a forecast, roughly half the generation by 1980.

[53] But this could change. This is a fluid thing. It could change.

Q Either way?

A Either way, but I would say it is more likely to change to a lower figure than a higher figure. It is the kind of thing that can change.

Q Would one of the factors affecting that changeability be control of air pollution, discovery of practicable air pollution controls?

A Oh, there are many things that can affect it.

I wish I could do as nice a job as I saw done by a Government power official, giving the heads of coal companies a lesson in load factor.

You see, if they start putting in nuclear plants, well, at the present rate or at a more accelerated rate, these nuclear plants get loaded very heavily, and you can make a very drastic difference in the coal burn by unloading the existing coal-fired plants.

You see, even the existing plants are not a certain market for the coal industry, because by shifting the generation to the nuclear plants, you reduce the generation and thereby the coal burn of [54] the existing plants, and you can make some very drastic changes that way.

Q My question was, would one of the factors that would be considered, be the control of air pollution? Is that one of the factors?

A That is one factor.

Q And wouldn't another factor be the ability to gasify coal reserves, coal deposits.

A I don't understand what that has to do with it.

Q Well, I am asking you whether it is one of the factors which will affect your prediction, or anyone's prediction, of the extent to which coal will be utilized for a generation of electricity.

A Not at all.

Q Gasification has no bearing on this?

A I don't see how that would affect the use of coal for generation.

Do you mean go through the gasification step and then use the gas to generate electricity ?

Q Yes.

A I don't see how that has any bearing at all.

* * * *

[60] Q In this article the authors refer to the generator as being designed to utilize bituminous coal with a range of analysis of ash as 10 to 20 per cent, moisture 3 to 15 per cent, fixed carbon 35 to 55 percent, sulfur 1 to 6 per cent, BTU's 10,000 to 13,500, and grindability as 45 to 70, hardgrove.

[61] What does "hardgrove" mean? Do you know?

A It is a scale of measurement for the amount of effort required to grind the coal. It is the hardness, really.

Q These specifications, are they ordinary or usual for a modern boiler, are they unusual, or would you care to comment on them in that respect?

A I can only say that they are the specifications stated by them for that particular unit, and I wouldn't characterize it beyond that.

Q Would you say that a boiler designed to use coal with a Btu value of 10,000 to 13,500 would be common, or uncommon?

A That is a fairly wide range, but you see, that plant is being—

Building a power plant involves a lot of complex factors. That plant is being built to use the coals from that particular area. That is a depressed area; it is an area served by the Kentucky Power Company, which would be the owner of that plant; and for a lot of reasons the company serving the area tries as hard as possible to use the coal from that area in the power plant serving the area.

[62] Q Do you know of any utilities in the State of Illinois or the State of Wisconsin which could not use coals conforming to these specifications, as I have previously stated in my prior question?

A Prior to building a power plant, you can use any coals.

Q Present existing generating facilities.

A I haven't looked at the specifications of coal in any particular plants in the Midwest.

I would assume that there are probably some who can't, and some who can, but I have no way of knowing exactly on any one plant.

Q The boiler design, then, can account for wide variations in the specifications of the coal to be used?

A No. You have got that backwards.

You find out what kind of coal you are going to use, and then you design the boiler to use it.

Q Well, whichever way you want to put it, frontwards or backwards, it is a function of boiler design, is it not, to determine whether—

A No, no. Boiler design is a function of [63] the coal, and it does matter which way you state it.

Q The next reference is to "Griffin, E. M., and Profita, G. D., 'Design and Construction of the Steam Generator and Related Equipment.'"

Who are Griffin and Profita?

A I really don't know Griffin, but Profita is a mechanical engineer with the American Electric Power Service Corporation.

Incidentally, I think if you look into the reference itself, it tells you who these people are. Griffin may be with the manufacturer.

Q Well, I was going to ask you whether you knew them and considered them reliable.

A Oh, I know Profita. He was involved in the design of the steam generator and related equipment.

Griffin, I don't know. I would have to look at the article to refresh my memory. I think he is with the manufacturer, but I am not sure.

Q I would take it that you would, in a general way, since you have used these references, vouch for the reliability and trustworthiness of the persons or organizations responsible for the documentations.

[64] Well, I can't vouch for what anybody else says.

* * * *

[88] Q Do you know Harry Perry?

[89] A Yes, I do.

Q Is he with the Department of the Interior presently, do you know?

A The last I heard, he was still with them.

Q What is his reputation for knowledge and reliability in the field of coal research?

A I think it is very good. I think highly of him, personally.

Q Do you know Joseph DeCarlo?

A No. That is just a name I always see on various Bureau of Mines reports. I think it appears on that Weekly Report.

Q How about J. H. Field, Project Coordinator, Process Engineering Group, U. S. Bureau of Mines?

A No. I don't think I know him.

Q In your report you refer to long-term contracts for coal supplies, entered into by electric utilities. Could you tell us the reasons why these long-term contracts, as you state, have been entered into?

A Well, I think I stated the reasons in the report, but to repeat it:

From the utility's point of view, they want to assure the economical supply of fuel or [90] the supply of fuel

as they have provided for it and anticipate getting that fuel for the life of the plant or for a substantial portion thereof. They want to assure the quality and the price.

A power plant is a very major investment, and it is all worth nothing if the fuel isn't there.

From the coal supplier's point of view, a coal supplier is very unlikely to make the investment to open a mine unless there is assurance of a market for a very substantial share of the capacity for a reasonable period of time; that is, a period of time long enough to amortize most of the investment.

So from the point of view of both parties, it is advantageous.

Furthermore, transportation arrangements that take advantage of economies of scale, such as unit trains, very often involve the ownership by either the utility or the coal company of the cars. This is another major investment, and this, too, has to be assured, guaranteed, for a reasonable period of time.

So for many reasons it is important to [91] have a long-term contract.

If you had a sulfur problem, for example, and you went out and got a low sulfur coal, you would want to assure that you had that supply and not find yourself, a year later, searching elsewhere for low sulfur coal.

MR. HEDLUND: May I interrupt here, and go off the record.

(There was a discussion off the record, after which the taking of the deposition was resumed as follows:)

BY MR. EISEN:

Q Do you know how coal companies acquire reserves?

A They acquire them in many ways.

Q Do you know how they acquire them? I mean, do you have any knowledge or experience on—

A Yes.

Q How do they go about acquiring reserves?

A One way of doing it is to buy land, another way of doing it is to lease land, another way it to get mineral rights with royalty payments. Those are essentially the ways of getting them.

* * * *

[104] Q Do you know the cost factors which must be considered in undertaking underground mining?

A In general.

Q Could you tell us some of those cost factors, the principal ones?

A The cost of digging a hole; there is a cost of ventilating, and it is a rather high cost. Then there is a cost of all the equipment, the digging equipment, the cutting equipment, the haulage equipment. That is about it; to drill a shaft, provide access, and so on.

Q What are the principal cost factors in undertaking strip-mining operations?

MR. HEDLUND: Such being the capital cost?

MR. EISEN: Yes.

BY THE WITNESS:

A The cost of very large shovels, trucks, and the cutting equipment.

BY MR. EISEN:

Q Could you compare the cost factors of underground versus strip mining, both as to capital costs and operating costs?

A The cost of developing a mine will vary, depending on conditions. As a rule of thumb in the [105] industry, they usually refer to a figure ranging between six and ten dollars a ton to open a mine, with the deep mine usually being toward the lower end and the strip mine toward the higher end, but it is likely to range somewhere in that area.

Q Have you ever had occasion to encounter a situation where there was a question as to whether to strip-mine a particular field or to underground-mine a field?

A I, personally?

Q Well, a situation that you were associated with, where you had knowledge.

A No.

Q During the time that you were associated with American Electric Power, did they ever run into a situation where they had to decide whether to go underground or put in a strip mine?

A No. As far as I can recall, it was always clearly in mind whether they do one or the other.

Q American Electric Power, as I recall, have what is considered a fairly deep strip mine, do they not, in Ohio?

A They are developing a strip mine. They have stripped a field, and there is now another [106] seam lower down which they are going to strip. I guess they have actually started stripping.

* * * *

[110] BY THE WITNESS:

A I don't understand what you mean by that. Do you mean somebody else, other than a utility, generate electricity with coal?

BY MR. EISEN:

Q Well, I said power generation.

Will there be a demand for coal, other than for utility purposes?

A Oh. A general demand for coal for purposes other than electric power generation?

Q Well, I don't want to eliminate power generation on a smaller scale than used by utilities. That is the only reason I didn't use that delineation.

A It is my view that this will continue to be a relatively small market, with virtually no growth and possibly some decline.

Q Is there presently research and development by coal companies and others in efforts to find uses for coal other than for power generation by utilities?

A There are efforts to gasify coal, liquefy [111] coal. I wasn't talking about that when I talked about the decline in this non-utility market. But whether this market will develop is still an open question. In any event, I would think it is a good distance away.

* * * *

[121] In covering these costs per Btu's, if indeed the cost of oil per Btu in Illinois is 60 cents per million and the cost of natural gas is 35 and 40 cents, and the cost of coal is about 25 cents, would you say that those three fuels in Illinois, so far as use for utility purposes, would be competitive?

A Yes, I would.

Q What is your basis for that statement?

A Well, in the first place, you can't simply look at the price of the fuel. You also have to look at the cost of burning the fuel. So inherently, gas can cost something more than coal and still be more economic fuel; so can oil.

And then there are varying situations: It may be that any particular utility can find that by locating a power plant on Lake Michigan they can get a lower cost delivery of oil.

They are competitive in this sense, also: Utilities are putting in a lot of peaking capacity. They need capacity that can come on the line very quickly for short periods of time. A coal-fired plant is not the kind of plant you would build for that purpose, for a number of reasons, so they [122] are putting in gas-fired turbines. Now, these gas-fired turbines are making it possible for utilities not only to meet peak loads or emergencies, but also making it possible for them to shut down a lot of the older coal-fired plants that would otherwise contribute to the pollution problem, for example.

Commonwealth Edison—I forget the figure, but Commonwealth Edison is putting in a very, very substantial amount of this kind of gas turbine capacity. I think it is something over half a million kilowatts, and it is shutting down old coal-fired units. The gas is directly displacing coal, so they are competitive.

Q Other than that one example of the Commonwealth Edison installation, do you know of any others in the Midwest area, Illinois, Indiana, West Kentucky and Minnesota?

A Well, AEP is putting in an emergency unit that can travel on a truck, in the event of an emergency or for peaking. Specifically, at the moment, I would hesitate to name any others specifically, but I would be very surprised if there is any utility, of any size in [123] the area, that isn't putting in some amount of this kind of capacity.

* * * *

[141] REDIRECT EXAMINATION

BY MR. EISEN:

Q I want to ask the witness: When you use the term "reserves," what do you mean by that term, "coal reserves"?

A That is what I am talking about.

Q In the same way it was used in the document to which you just referred?

MR. HEDLUND: Well, Mr. Eisen, I might point out that it is used in a variety of senses in the report itself.

MR. EISEN: Well, I was just trying to draw on the witness' knowledge and experience.

BY MR. EISEN:

Q When you hear the term "coal reserves," what do you understand that to mean?

A I try to find out what whoever is using the term means by it.

For example, I know the 800-some-odd billion tons of coal reserves, that is often referred to, generally means a total resource. But this doesn't mean anything if you are talking about what is economically recovered at present prices or what tonnage you can recover if you permitted a 25 [142] per cent increase in cost or a 50 per cent increase in cost.

As a matter of fact, Dr. Netschert, some years ago, in a book on oil reserves, I think was one of the first to draw this distinction between ultimate resources and reserves; ultimate resources being the total of everything that you have in the ground that you might find, and reserves being defined in terms of a specific price; that is, the coal or the oil that you can recover at X dollars per ton or per barrel or an additional amount.

They do the same thing with uranium now. They talk about the reserves available at $7 a pound, the reserves that would be available at a price of $10 a pound, or the reserves that would be available at a price of $20 a pound. This is a much more meaningful kind of reserve figure.

MR. EISEN: We have no further questions.

MR. HEDLUND: We have nothing further.

We will not waive signature, but an any—Notary stipulation is acceptable to us.

MR. EISEN: Yes. That is acceptable.

AND FURTHER DEPONENT SAITH NOT.

* * * *

[3]

EXCERPTS FROM DEPOSITION OF PETER O. STEINER, TAKEN OCTOBER 7, 1969

* * * *

PETER O. STEINER,

called as a witness by the plaintiff herein, having been by me, the said Frances B. Spina as Notary Public aforesaid first duly sworn, was examined upon oral interrogatories and he did therefore depose and testify as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.
A Peter O. Steiner.
Q And what is your home address?
A 2611 Hawthorne Road, Ann Arbor, Michigan.
Q By whom are you presently employed?
A University of Michigan.
Q What school?
A I have a joint appointment in the School of Law and the College of Literature, Science and the Arts.
Q And what are you teaching in the School of Law?
A This semester I am teaching, with another member of the staff, a course in Federal Antitrust [4] Law.
Q Is that Professor Kauper?
A No. Professor Kauper is on leave. Professor Donahue is the other member of the staff.
Q What are your duties in this antitrust course?
A I am, with Professor Donahue, teaching the course.
Q What do you highlight—the economic aspects of antitrust; do you go over the cases?
A We are teaching the course jointly. My competence is as an economist, my training is an economist. His is as a lawyer. Obviously, I spend more time on the economic aspects.
Q What is the methodology? Do you have the case method in this course?

A Yes, we do.

Q And do you examine the cases both in the legal aspects and the economic aspects?

A Yes.

Q And is it your duty to comment on the economic aspects of the various cases?

A It is my privilege.

Q And do you?

[5] A I do. I try to.

Q Profesor, where did you go to college?

A I was an undergraduate at Oberlin College.

Q What was your major?

A Economics.

Q Did you graduate from Oberlin?

A Yes, I did.

Q And where did you do your graduate work?

A Harvard University.

Q When did you graduate from Harvard?

A I got a Master's Degree in 1949, and a Ph.D. in 1950.

Q Was the Master's in Economics?

A Yes, it was.

Q And the Ph.D. in Economics?

A Yes.

Q What was your thesis at Harvard?

A It was called "Workable Competition in the Radio Broadcasting Industry."

Q Other than your education at Oberlin and at Harvard, did you attend any other universities as a student, either graduate or undergraduate?

A No, I did not.

Q And you were a Teaching Fellow at Harvard [6] while you were getting your Doctorate?

A That is correct.

Q What did you teach at Harvard?

A I taught in the Elementary Accounting and the Elementary Statistics courses.

Q Would that be in the Business School?

A No.

Q In the Economics School?

A In the College.

Q You are also teaching at the present time, are you not, in the Arts College in Michigan?

A That is correct.

Q Literature, Science, and the Arts College?

A That is correct.

Q And what course are you teaching now?

A I am not teaching any course this semester. I am teaching two courses next term.

Q And what courses will those be?

A One will be a graduate course in economic theory, the other will be a sophomore course in economic statistics.

Q In what year did you get your Ph.D. from Harvard, again?

A 1950.

[7] Q And following the award of your Ph.D. from Harvard, what did you do?

A In 1949, I went to the University of California, and began teaching there.

Q At Berkeley?

A That is right.

Q And what did you teach at Berkeley?

A Well, I was there for seven years, and I taught a great variety of things, mostly economic theory, some industrial organization, some statistics.

Q Other than what generally could be referred to as economic courses, did you teach any other courses at Berkeley?

A No, I did not.

Q And you were at Berkeley from 1949 to what—1956?

A I was officially there from 1949 to 1957. I was in residence to 1956. The year 1956-1957, I was on leave at Harvard. I was still nominally on the Berkeley staff, but I did not return there.

Q What did you do at Harvard?

A I was there on a Social Science Research Council Fellowship, doing research and attending an occasional seminar.

[8] Q What did you do research on?

A That year I was working chiefly on two problems. One was peak-load pricing, and the other was—well, really it was concerned with water resources, but it was really a problem in the analysis of public expenditures and public expenditures criteria in water resources.

Q What does peak-load pricing refer to, sir?

A It refers to the fact that some industries, electric utilities, for example, may have different levels of demand for their capacity at different times of the day or different seasons of the year, and the problem is to determine what is the appropriate capacity they should have in this sort of a circumstance and the appropriate utilization of that optimal amount of capacity when you determine it. Frequently this is accomplished by variations in prices, by having lower prices for off-peak users. As you know, it is the kind of problem that comes up with respect to gas, with steady and interruptible gas; it comes up in lots of uses.

My particular concern was with the effect of the pricing scheme on the amount of capacity that was created.

[9] Q And you were at Harvard for years, then, doing this work?

A I was there the academic year 1956-1957.

Q And what did you do after that?

A I joined the faculty of the University of Wisconsin in Madison.

Q Did you join as an Assistant Professor?

A No.

Q As a full Professor?

A No.

Q As an Associate Professor?

A That is right.

Q And what did you do at Wisconsin? What did you teach there?

A I was in the Department of Economics, and I taught a variety of courses in Economics for the next eleven years.

Q Both in the undergraduate and the graduate school?

A That is correct.

Q And when did you leave Wisconsin?

A I joined the faculty at Michigan in 1958, July 1, 1958.

Q Do you mean 1968?

[10] A Thank you. I mean 1968.

Q Other than the academic career which you have just outlined, what full-time jobs have you had since graduation from college?

A I spent something over three years in the Navy during World War II.

Q Other than that, sir.

A None seriously. I spent, I think, the first three or four months after I graduated from college as an employee of Macy's in New York.

Q A summer job, in other words.

A It wasn't a summer job, but it was a job between college and being called up to active duty.

Q I see. Would that be all?

A I believe so, yes.

Q You have told us the title of your thesis, Professor. Did you write anything that was published in college or in graduate school other than your thesis?

A No.

Q Since the publication or the writing of your thesis, what have you written?

A I have written a fair number of things. I would be glad to give you a list, if you like. [11] I would be glad to mention some of the—

Q Would you give us the highlights, and would you also supply us with a list?

A I would be glad to do that.

I have written, well, three major books; one was called "The Economic Status of the Aged," second is a text book with Richard Lipsey, called "Economics," which was in two editions, and the third is "An Introduction to the Analysis of Time Series."

I have also contributed chapters to half a dozen other books, and I have written, I suppose thirty or forty articles and thirty or forty book reviews.

I think it is easier to give you a list than to read the list into the record.

Q May I see the list, please, sir.

A Yes. I may even have a more up-to-date one than that.

Q If you have a more up-to-date one, we would appreciate having it.

• • • •

[19] BY MR. CUSACK:

Q Professor Steiner, I hand you what has been marked as Steiner Deposition Exhibit 1 for identification, and I ask you, sir, to identify [20] this, please.

A I identify it in the sense that it is what it purports to be.

Q And what is that, sir?

A It is a statement by me basic biographical and bibliographical facts about me.

Q And starting on page 1, at the bottom, you have a list of publications which goes to page 5, is that correct, sir?

A That is correct.

Q And as of August, 1969, which is the date of this document, are these all the publications which you have written?

A I have not listed in here book reviews and some minor things. These are all the substantial publications that I have had during that period.

Q Thank you.

I believe, Professor, we were discussing your role as a consultant to the Bureau of the Budget in regard to budgeting.

A Yes.

Q This was, I believe, in 1959 and 1960?

A No. It turns out that the report here, which [21] appears on page 5, called "The Classification of Budget Data"—

Q That is page 5 of Steiner Deposition Exhibit 1?

A That is correct.

At that time the Budget Bureau was considering whether it should shift to a system which is sometimes called "capital budgeting" in one of a number of reforms, and I looked into their budget procedures and prepared this document.

It was published in 1962. I believe I spent about a year working on it, so it would have been 1961-1962.

More or less concurrently with that, I was a consultant to the Department of Treasury, consulting in the Office

of Tax Analysis, on the subject of oil depletion. At that time, even as now, there was a tax reform bill being discussed.

I had, as I mentioned earlier, done some work on oil and oil depletion, partly as a result of the consulting I had done for Pan American Petroleum, but partly in terms of some articles I had written which also appear here (indicating), and I was consulting for the Treasury.

[22] Q Excuse me.

This work for the Department of the Treasury, when was this, sir?

A I am not exactly sure. It was the time when the Kennedy administration presented to Congress ultimately the tax cut bill. At the time this was going on, if you recall, there was discussion of a tax reform bill as well. At the last moment the political judgment was made to defer reform and to fight for the tax cut.

That, I think, was sometime in 1962-1963, to my recollection, but the dates on that can be readily checked.

Q To whom did you report at the Department of the Treasury on this matter?

A The Office of Tax Analysis, I think was under the direction of Stanley Surrey who was an Undersecretary of Treasury. His chief Economic Assistant was Harvey Brazer, and I worked directly as a consultant for Brazer and with Surrey. The two of them were the people to whom I reported. I did a number of memoranda for them, and so on.

Q Did you reach some conclusions in regard to the oil depletion allowance?

A I think that I participated in, with the lawyers and other economists involved, coming up with a series of proposals for tax reform in this area.

Q Very generally, what were your proposals?

A That the size of the subsidy involved in the depletion allowances could be reduced for the same benefit if we undertook a number of changes, including the redefinitions of properties, changes of rules with respect to consolidation, changes in the treatment of certain classes of royalty recipients, and that perhaps we could accomplish the objectives of reform in a politically more satisfactory way than by a direct attack on the rate of depletion.

• • • •

[23] That tax reform proposal did not involve a cut in the rates, although it proposed change, I believe, in the net income limitation and in definitions of properties, the consolidation rules, and so on.

It is a document that I suppose still exists somewhere. I think largely due to the influence of the then Vice-President, Mr. Johnson, [24] this was put to one side and other things took precedence.

Q We understand.

What other consulting work have you done, sir? We can take it in order or approximately the same time.

A I think about that same time I became a consultant for Mayer, Friedlich in Chicago in conjunction with their bank merger case, a merger of Continental Illinois and Security National Bank.

Q Do you mean City National Bank?

A I am sorry. The City National Bank. Thank you.

Q And you were retained by Mayer, Friedlich as a consultant?

A That is right.

Q At this time you were at Wisconsin, I understand.

A Yes. I was at Wisconsin, and I do not remember, but again that could easily be checked, precisely when that was.

That turned out to be a major venture on their part, and on mine, until, as you know, that case was ultimately mooted by the new bank merger [25] legislation which effectively exempted that merger from attack.

* * * *

[143] Q Well, then based on that assumption and stipulation, would you agree with the statements that he makes in the paragraph which I have just read?

And please take your time, if you so desire.

[144] A He says that growth by merger. That is, I take it, what he means by—

Q External growth?

A External growth.

He is measuring here the concentration, I take it, as measured by the eight largest Midwestern producers. He is taking the growth of their production, and he is measuring that increase in production in terms of the production from acquired properties. Within those definitions,

I have no serious doubt but that his computations are correct, although I have not in fact checked them.

Q Going on, sir, to some additional statements made in your report, you state that:

> "The period of rapid change and basic challenge to individual coal producers, and coal mining as a whole, has not ended."

I assume this is still your view, sir?

A That is correct.

Q And on what do you base that opinion?

A I think that sentence must be read in the context or as an introduction to the two following sentences, each of which I think bears [145] upon it. One of these concerns the utilization of nuclear energy, which is playing an increasing role; the second is the challenge that air pollution and air pollution regulations will place upon coal producers.

With respect to nuclear energy, I think one doesn't need to look very much further than, I believe it is Dr. Netschert's Table IX, to see that nuclear energy, which, as of 1968 appears to account for approximately one per cent of capacity, appears to account for approximately 39 per cent of the planned additions to capacity.

From what I see from what is in the record at a number of places, it is very clear that nuclear energy is playing a role, and its role, if I were a coal producer or if I were the coal industry, I would regard as a source of competition that is beginning to play a role that has not played a role in past statistics in terms of in-place and operating capacity.

I think with respect to the anti-pollution effect, which represent, if I read the record correctly, a more serious threat to coal producers and to producers of other competitive fuels, that [146] the increasing concern with this problem, and the increasing application of existing ordinances and the probable introduction of new ordinances, are bound to challenge the coal industry either to effectively find low-sulfur fuels, which would be expensive, or to desulfurize the fuel, which I think the SEDRA report persuaded me was not either a quick or a cheap matter.

Q Which report was that, sir?

A The SEDRA, Seversky Environmental Dynamics Research Associates.

It was my impression, from both of those sources, that the coal industry period of competitive struggle was not over, that both of those things, the challenge of other fuels and the challenge of meeting the pollution requirements, meant it would be under continuing pressure to find ways of reducing its cost if it were to effectively compete twenty and thirty years hence, which is the period, I take it, one is talking about when one talks about the foreseeable future.

* * * *

[182] Q Professor, as the public utilities have entered into long-term contracts for the supply of coal, do you know whether they have reached further away geographically to fulfill these contracts?

A I think it is my general impression that the unit train has extended the reach, and that the long-term contract has, in some cases, led to greater distances for supplies and otherwise. But I do not have a very strong factual basis as to whether, on average, the distance of a ton of coal that is shipped has increased, and if so, by a significant amount.

It is my impression that these various things have increased the potential range of the coal companies, just as increasing utilization of the coal near them pushes them out. Indeed, part of the incentive, if you like, for some of these long-term contracts and economies may have come about because of the need to ship coal longer distances if coal is to be used.

MR. CUSACK: I would like to have a minute to consult with my colleagues.

* * * *

[185] Q And I take it that that is your view, that there are a sufficient number.

A That is correct. As I try and go on, then not only because of their number but because of the nature of the buyers with whom they deal, and their bargaining power and the availability of alternative sources of

supply, my conclusion, as we come to in Paragraph 12, is that the situation is basically competitive and that the goals of low prices, pressure on costs, pressure to improve in response to demand, still exist.

Q At what point, Professor, would you consider the concentration in the coal industry in the Midwest to be anti-competitive? At what level of concentration?

For example, why don't we glance at the schedule entitled "Production of Coal in Illinois by the Leading Companies and their Subsidiaries for the 1967 Calendar Year," or, if you will—

THE WITNESS: Well, could you help me find that?

* * * *

[187] Let's first suppose that the relevant measure of market share is production. That is something, as you know in my memorandum I suggest it seems to me that in coal where the business is future contracts may not be correct, that maybe we should be looking at uncommitted reserves or total reserves or—

But let us, for the sake of the discussion of this point, take production as the relevant measure, that is, take the figures in the Table. I can readily conceive of circumstances in which, if the four-firm concentration were as high as it is there, or the eight-firm concentration, you would begin to say you were either at or near the point where you worry about market share. If, for example, there were no other sources of supply, if there were relatively weak buyers—I don't think I want to go into now that situation.

* * * *

[191] It is the essential question, obviously, of anti-merger policy, when it is applied to specific factual situations.

Q Well, Professor, would you be alarmed if one company had 50 per cent of the Midwest production of coal?

A There are many things in this. I said to you that I am not necessarily persuaded that production is the relevant statistic.

If it turned out that one company had 50 per cent of this year's production, had no reserves, had all of its existing reserves—no reserves other than those committed

on long-term contracts, I would think that company would not be an important factor in future competition. Moreover, so far as it had acquired that market, it was already spent on these long-term contracts.

Q Professor, assume—

MR. HEDLUND: Have you finished your answer, Dr. Steiner?

THE WITNESS: I am not sure.

MR. HEDLUND: I did not mean to imply that you hadn't. Mr. Cusack jumped in.

* * * *

[192] When one talks about the coal industry, at what stage the concentration, whether in the hands of a single firm or the group of leading firms, has the effect of substantially reducing [193] competition is one that has to be determined, and it is much easier to determine that in the actual factual situation than it is in the hypothetical situation; that is, in this situation we can look: Given this degree of market concentration, has there been a tendency for the price of energy to rise, and the answer to that appears to be no; therefore, we seem to conclude at this level that this increase in concentration, this shift of the utility market so that it is very heavily involved in a relatively small number of companies, appears not to have exhibited any of the signs of anti-competitive performance and behavior that are those indications.

Now you are asking me to take a quantum jump from there to a situation that is different.

If you said, "Suppose all the coal in the United States were under the control of a single company, would you be alarmed?" And I would say, "Of course I would be alarmed." I can see all sorts of people who would have their alternatives highly limited, and who might indeed be exploited by that, and it is perfectly clear—that extreme is easy.

[194] BY MR. CUSACK:

Q Well, Professor, assume that you had one coal producer in the Midwest. Wouldn't your consumers be able to turn to oil, gas and nuclear as an alternative source of supply?

A In the long run, of course they could.

Q Then would this extent of concentration bother you?

A Yes, of course it would, because there is the existing life of companies that are committed to coal; there is very likely the too-rapid phasing out of coal in the long run and shift to other things.

The competition in the coal industry benefits the use of resources. It is a societal gain, in terms of if it leads to coal being produced at something like its appropriate cost level, if it stimulates the search for better ways to mine and produce coal, it stimulates efficiencies in these ways.

Q Professor, how could a consumer be harmed, if there was merely one producer in the Midwest, if that consumer could get alternative sources of fuel?

A Because if that consumer, let's say is [195] committed in terms of its present boiler design for the next ten years to use coal, it is, in the first place, limited in what it can do for the next ten years, and it could be hurt. It is, in the second place, if it is building a new plant, faced with only one coal producer, and let's say one other producer, and its alternatives may indeed be more narrowly limited than they ought to be.

* * * *

[217] Q Assuming coal consumers in Illinois purchased on a regular basis, and—you gave the case of a housewife—let's take one coal consumer, and let's say this coal consumer purchased coal from, say [218] half of the mines in Illinois but not the other half. Would all of the mines be in the market area, or just half of the mines?

A It would depend whether all the mines were among the practicable alternative sources of supply.

Q This is the key thing, then, the practicable alternative sources of supply?

A That is a key thing, yes.

Q Is it the crucial thing?

A The crucial thing for what?

Q For determining the section of the country.

A I thought we were talking about a market.

Q No. I am talking about section of the country.

A If my recollection serves, that is the first time that phrase has been mentioned this morning.

Q All right. Market area, relevant market area.

A May I distinguish two situations, Mr. Cusack: one in which you have a customer, let's say a coal consumer, who purchases from half of the coal producers in the State of Illinois, and [219] in which it is quite easy to distinguish that half of the coal producers from the half from which it does not buy, in terms of such factors as quality of coal, distance, location, and so on, and in which you could thus say this first set consists of those from whom it could practicably buy, in the sense of the products being close substitutes, and this other set is substantially less practicable for it to buy from; as distinct from a situation in which that same customer buys from half of the coal producers, and you say this looks to be a choice of either random assignment or convenience or so on. I cannot see any significant difference between the half from which the customer buys and that from which the customer does not buy.

I would say that one's interpretation of that evidence as to which firms the customer buys from is quite different in the two cases. In the first case I would think there would possibly be a market division that included one set and excluded the other, and in the second set it might well be that there was no sensible distinction in the market alternatives available; it is just [220] that the customer had chosen to exercise options with certain of the sellers to whom he could have turned.

* * * *

[258] BY MR. CUSACK:

Q Would you please tell us specifically—you mentioned United Electric. Do you know of any other companies or any other mergers?

A I have not evaluated any other of the mergers.

Q On what, Professor, do you base your testimony in regard to the United Electric merger? On what evidence?

A On all of it.

Q Which evidence? Whose testimony?

A Well, let me talk about what I think the evidence is, and then we can come back and say where is it that I learned that particular piece of information from.

I am persuaded, on reading this record, that United was in a position where its current strip reserves were heavily committed; where its uncommitted reserves were small.

I am persuaded, reading the record, that [259] it was unable to obtain additional strip reserves of economically minable quality, and that without such reserves it was unable to enter into future long-term utility contracts of the kind it currently has, and that it has, in the past, entered into.

I am persuaded, by the record, that United Electric Companies did not have a deep-coal capability, in terms of its management and mining personnel, so that it could have effectively operated a deep mine in a complementary fashion to its remaining strip reserves so as to, from the two sources, provide coal on a contract.

Q Are you finished with your answer?

A I am thinking. That has been a long answer. It was a long question that you asked, and I am thinking as to where—

For those reasons, its inability to get the reserves necessary to enter these contracts, it seemed to me that it was necessary for United in some way to acquire sufficient coal so that it could enter in the future, and I am persuaded that merger with a deep-coal mining company was one of the alternatives open to it, and perhaps in view [260] of the general reserve situation and the shortage of trained mining personnel, the only way open to it.

Now, you also asked about the sources.

Q Yes. What are the sources, Professor?

A Some of that information, certainly the notion with respect to reserves, and to some extent the difference between deep-mining capability, I have from Mr. Weir and Mr. Organ. It was also discussed at some length in the depositions of Mr. Nugent, Mr. Morris, I believe, and Mr. Tarzy, and I have some from the report of Dr. Netschert. I am sure there are other places as well.

This kind of issue, it seems to me, is a central issue in the lawsuit, and therefore it has been discussed by both you and Mr. Hedlund with a dozen of the witnesses on deposition.

Q Did you read Mr. Organ's deposition?

A I didn't read his deposition; I read his letter. Indeed, I may have read his deposition. I don't remember. I did not read it at the time I wrote this report.

Since writing this, I have received the depositions of the several expert witnesses, and I [261] have read, I know, the Netschert and Gerber ones, and I think I have read the Organ deposition.

* * * *

Q Is it your belief that it is, in many in- [262] stances, of identical quality?

A I don't know that, either.

I think that the coal quality is determined by the coal seam and its properties, and I am sure that some seams are strippable at some locations and are deep at other locations.

Q Professor, would you believe that it would be legal for United Electric to be acquired by Peabody?

A We are going back to the question of my deciding what is legal or illegal. It is not a posture that I enjoy, although when I am appointed to the Court I will be pleased to answer that kind of question. I hope the record will show that I was being facetious in that reply.

A I don't know. I have not looked at that acquisition, as to whether in fact the facilities of Peabody and of United—exactly where they are located.

I think it is my basic position, having looked fairly hard at this record, and as this record discusses the position of United, it seems very clear to me that absent some source of economically minable reserves the United Electric Coal Company [263] does not have much future in terms of its ability to sign supply contracts with electric suppliers.

If I recall, the uncommitted strip reserves of the United Electric Coal Companies, they were of the order of magnitude—and I wouldn't want to be plus or minus two million tons here, but the order of magnitude of nine or

ten million tons. That is, if I remember the record, something like the whole sum of its uncommitted strip reserves of minable quality. I am excluding there the Industry Field reserves, which I read the testimony to argue are not currently an economically viable, strippable, deliverable source of coal.

If that is so, all of those reserves put together are hardly enough to sign one 20-year contract for a million tons a year; they are not half large enough for that. Moreover, those reserves, as I recall, are not all in one place, although I forget exactly where they are.

If that is so, that is, if The United Electric Coal Company is not any longer, without acquiring new reserves, an active competitive factor in the future's market, then its impact competitively in that market as an independent [264] entity is not very large.

But how its acquisition by any company would be regarded competitively depends not only on its position but on the position of the acquiring company. And I don't know enough about Peabody. I know about Peabody that it is a very large company. I think acquisitions by the very largest company in the industry are always looked at, and should be looked at, more closely than by smaller companies.

I am not trying to avoid the question at all. I am saying that on the basis of my general knowledge it seems to me that one would be more likely to find an anti-competitive effect in that merger than in this one, but I don't know enough about the facts to say whether the anti-competitive effect would be so large that it would lead a Judge to find it illegal or not.

Q Well, Professor, if it is so, that United Electric is not an active competitive factor in any market, then what difference would it make who bought United Electric?

A I did not say it was not an active competitive factor in any market.

[265] I think that it has reserves, it has personnel, it has an organization, it has equipment, it is a going concern. It has, among other things, certain deep reserves, which may be of value to an acquiring company that

has the capacity to evaluate them. I am not enough of an expert to know what the quality is of its deep reserves in—I think it is Round Prairie that is its major deep field.

I think one has always to ask the question as to whether its acquisition by Company X changes X's position in its market in such a way to adversely affect competition, and I think that Peabody, being a large producer, one should look at that question. I think that Freeman, being a major producer, that clearly this case is looking at the effect of this merger on Freeman's position.

I think that we are concerned, all of us, with the effect on competition, and that is concerned with the viability and the competitive position of each of the competitors in a market.

Q Professor, in your view, in what market or markets is UEC an active competitive factor?

A It is certainly an important current producer and an important past producer in the electric [266] utilities' energy market as a source of fuel from several of its mines. It also, I am sure, has—I know; I remember. It has significant sales to other markets as well, but let me concentrate on utilities' market.

I think that the problem United faces, and, I gather from some of the deposition testimony, has recognized that it has faced for at least ten years, maybe for fifteen, is that it was not acquiring reserves at the same rate it was exhausting these reserves, and thus its future competitive position has been shrinking. It is, of course, continuing to produce on existing contracts, and it has a non-negligible—I think that if the figure I gave you from memory was approximately correct, of nine or ten million tons, that is not a negligible amount of high-quality economically minable coal, and that that will play some role in the market.

I think perhaps more important is that it has a going-concern capability, of sales personnel, of strip-mining personnel, of executives, of others, that, I gathered from, I think it was Mr. Weir's report, are in short supply, that mining [267] personnel is hard to come by, and this is clearly one of the things that The United Electric

Coal Companies have, and that that is an asset to the people who own that company.

Q What about its financial position, Professor? Would this also be an asset, in your opinion?

A Well, clearly it has reserves which it acquired advantageously, and which it is mining at a profit. Presumably, whoever owns this company has those profits, and in a market where capital is a scarce commodity and interest rates are as high as they are, this is clearly an asset of some value. I wish I had acquired United Electric Coal Company sometime ago. I would be delighted to be receiving these profits.

Q You would then consider United Electric to be a highly profitable coal producer?

Well, I don't want to put that in any words.

At what level of profitability would you consider United Electric?

A Well, I think it is quite clear, if one looks at the acquisition price by the company of its reserves, and the sale price of that coal, that it is indeed highly profitable. I think that to whom [268] those profits accrue depends on when one bought into the company, if one were a stockholder, and so on.

* * * *

[269] BY MR. CUSACK:

Q Professor, I direct your attention to page 3 of your report, under numbered paragraph 4. The sentence states:

> "The increasing predominance of the electrical utilities as purchasers of steam coal, the increase in the designed capacity of new electric generation units, and utilities' insistence on a large, reliable, and low price source of fuel over the 20 or 30-year life of a generating facility, has led inexorably to the emergence and survival of coal producers with large reserves, developing large mines which are devoted to serving a small number of customers on long-term contracts."

Professor, in your opinion have electric utilities forced mining producers to construct larger mines with larger quantities of dedicated reserves?

A Only through market pressures. If they have forced them to do so, it is only through the desire of the coal companies to retain their position in competing for the electric utilities' business.

My I just, at this time—as you read [270] that quote, I think you did not read precisely what I had written there, and I would like to correct the record.

I think at one point you said "has led," and my statement says "lead." It may not be important, but I would like to have it correctly in the record.

Q Thank you.

A You are welcome.

Q Professor, is it your opinion that the electric utilities and not mine producers have initiated the growth of larger mines with larger quantities of reserves?

A No, indeed, Mr. Cusack. It is, I think, the virtue of a market competitive system that the supply response to demand changes are accomplished through the market. That is indeed one of the beauties of competition, and why we are all devoted to free markets and competition.

If I decide that I want a color television set and lots of other people do so, in one sense you may say we force the television manufacturers to provide color television sets, but in another sense they are just responding to the opportunity to get that [271] portion of my expenditure.

Q Professor, do you know whether a coal producer would rather suply coal under a long-term contract?

A I believe on average and in general they would prefer so to produce coal, but of course whether a contract is satisfactory depends on lots of things, including the price you get for your coal. There is no general answer to that question possible.

Q I am going to give you the following hypothetical, Professor:

Assuming that a generating station will require 30 million tons of coal to supply its fuel needs for the life

of a particular generating station. In your opinion, Professor, would the utility prefer to have one mine supplying the total of 30 million tons of coal—that would be one million tons a year for thirty years—or would they prefer to have five mines supplying a total of six million tons each over the next 30-year period?

And is it not a fact that the delivered price per Btu would be the prime consideration rather than the number of mines supplying the coal?

[272] MR. HEDLUND: You have asked him two questions. To which do you want him to respond first?

MR. CUSACK: The first one, and then the second one.

MR. HEDLUND: The first one first?

MR. CUSACK: Right.

MR. HEDLUND: Do you have the question, Dr. Steiner?

THE WITNESS: Yes.

BY THE WITNESS:

A I think taking into account all of the factors that go into it, there probably would be some advantages to the utility in having a single contract with a single mine, for two reasons: One reason, I think it would probably be getting uniform quality of coal, which perhaps would be an advantage in terms of its boiler utilization; and second, I think it would be likely to be able to negotiate a more favorable price to it with a single mine than with five mines of six million each.

But clearly, as you suggest, its effective delivered energy cost is what it is interested in, for the reasons, I think—not withstanding the [273] answer to your second question, that seemed to be suggesting a negative answer to the first, and the reason I think that isn't appropriate is, it seems to be that both in terms of the uniformity of coal quality and the ability to negotiate a favorable freight rate, it might very well be advantageous to have a large-scale contract that would support a unit train. And my guess, without really knowing, is that six mines providing five million tons over thirty years would involve a variety of locations and a

variety of freight rates and would be less likely to be satisfactory.

BY MR. CUSACK:

Q Professor, assume a strip coal producer, with an annual cash flow of between five to seven million dollars a year, that has been successful in strip mining and has failed to develop new reserves, either strip or deep, to replace reserves at existing mines which have been mined, would these facts have the effect of diminishing competition in the bituminous coal industry in the area in which that coal company had been competing?

A I don't understand the question, Mr. Cusack. You said diminish. Does the cash flow diminish compe- [274] tition

* * * *

[276] Q Thank you.

Professor, the first sentence at the top of page 4 of your report, numbered paragraph 5, states:

> "The progressive disappearance of the small producer reflects the disappearance of the railroad market and the decline of the space heating market, the retail market and spot coal purchases by utilities."

Professor, do you have an opinion as to why utilities have reduced their spot coal purchases, if in fact such is the case?

A Let me pass on the question of what the volume of coal purchased by utilities on the spot market is, because I don't have those statistics in mind.

It is clear to me that the supply conditions, and that the demand conditions in other fields, have decreased the profitability of supplying coal to the spot market because the spot market largely depended on kinds of customers such as the residential consumers, and so on, who purchased coal [277] that way.

I think this was discussed at length in—was it Mr. Peterson's deposition? Was he the Chicago retail coal dealer? It was discussed at some length, and it was sometime ago that I read it, but if I recall, he discussed the shrinking of the demand side of that market.

As that demand for spot coal shrunk, the number of firms supplying it necessarily shrunk, because there was nobody to buy their coal, and if that market and that whole pattern of marketing decreases, then the potential short-run supplies that could be diverted into the utility market would necessarily decrease.

What I am saying, I think, is that that market basically existed to supply spot purchases from spot suppliers. When such a market exists, there is an opportunity, if their excess supply is building up, excess inventories, for utilities to pick up coal cheaply in the spot market. I think the utilities clearly are always interested in picking up cheap coal if they can do it, and I think there is less cheap coal available.

It is perfectly clear in the record, I [278] think, that utilities are unwilling to design boilers, locate plants, and so on, depending on a spot market, that they seem to be desirous of having an assured supply for the bulk of their requirements. But of course they are in a position, if they can use cheap energy, whether in the form of interruptible gas or spot coal, if it meets their requirements, to use it.

Q In your view, Professor, which came first: the desire of the electric utilities not to purchase spot coal, or the unavailability of the spot coal?

A I would think the unavailability. I would think that the shrinking of the spot market is readily understood in terms of the disappearance or decline of these other markets that are mentioned. I think it is related, in the sense that I think it is the only demand for spot coal, with the incidental demand of utilities for fill-in coal.

This would not be an attractive way for small companies to make a living, because the price that utilities will pay for that coal, in terms of energy units, would have to be less than the energy they can receive on long-term contract. And be- [279] cause of, among other things, several handlings, and so on, higher freight rates, the absence of bulk freight rates, it is perfectly clear that if the utilities are going to get a bargain in terms of spot coal, the producers of spot coal are not

going to have a bonanza in producing for that market.

Q Do you know whether the utilities desire to purchase a substantial amount of spot coal?

A From what I know of the utilities and of the motives of businessmen in general, I would think that if they could buy it cheaply enough, they would be willing to buy a great deal.

I think that the purchase of fuel by sophisticated fuel users is based very much on the delivered cost to them of Btu's, with, of course, the other considerations of the suitability of the fuel for their particular boilers, and so on.

Q Professor, do you know whether the disappearance of the spot coal market has been in any way due to the desire of the coal producers to sell their coal under long-term contracts?

A I think once again, Mr. Cusack, I have difficulty with that question, only because in a [280] marketed kind of economy, all the parties to it have hopes, have motives, and react to market signals, but that basically it is the market forces of supply and demand as they bear on both demanders and suppliers that leads to the results it does.

The reason coal producers, I take it, supply on long-term contracts is because it turns out they can make more money that way. They don't desire to do that for its own sake; they don't do it because there is something elegant about a long-term contract. I am sure if they could make more money selling on a spot market, they would do so. If a particular management didn't do so, that management would do less well with its companies than companies that responded to the market signals.

So that these responses seem to me to be market responses of a competitive market, and precisely the kind of allocational decision that competitive markets and free markets do so well.

Q Professor, I direct your attention to page 4 of your report, Steiner Deposition Exhibit 2, under numbered paragraph 5, the second to the last sentence, which states

[281] "Typically, the opening of a mine is geared both to a given long-term contract, a given plant location, and a previously negotiated freight rate."

Professor, which mines were opened under these conditions?

A I cannot answer that question.

I think that my information here comes heavily from the record, whether the Tarzy deposition or the Nugent deposition or discussions of Netschert and Gerber. It seems to me these facts I believe to be the case, but they are my impression of reading the record.

I cannot tell you that a particular mine was opened—I know that there are particular mines that have been opened after negotiation with a particular contract, and that mines have been opened in response to them, but I do not know the names of them or the locations of them specifically.

If it becomes important to you, I expect I could search the record and find some illustrations, but I have no knowledge other than that which is in the record.

Q Concerning the sentence on page 4, under [282] numbered paragraph 6, which begins on page 4 and ends on page 5, it is as follows:

> "For the same reasons, the comparative competitive stretch among coal producers and their prospective market positions should be measured by the quantity, quality and location of their reserves, rather than by their current or past levels of production."

In reference to this statement, Professor, I take it that in your opinion it would be impossible to measure the competitive strength of a company by examining only the quantity of its reserves, is that correct?

A Do you mean independent of their quality and location? Yes. I think that quantity alone would tell you not enough.

Q Would it be possible, in your opinion, to measure the competitive strength of a company by examining only the quality, quantity and location of its coal reserves?

A No. I think additionally we would need to know

something about its capability to translate those reserves into coal. It would obviously have to have or be able to acquire mining capability.

Q Would this be personnel capabilities and [283] financial capabilities? Would that be involved? Would that be important?

A Well, I think all of those things are important. Which would be likely to be critical constraints on its ability, I don't know.

I assume, and I think the reason that is left out of the paragraph, is that having said that these were coal producers, one assumed that they had at least some capability. But obviously, for coal to be competitive in production it must be produced; and thus, if I owned reserves, I would have to either hire someone to mine them, or I would have to acquire an organization to hire them, and that might be a formidable barrier.

So you are perfectly right, that that statement, as it stands, could be modified, and perhaps should be, to say "producers with appropriate capability should have their market positions measured by quantity, quality and location."

But I think the point of the paragraph that I am concerned with is that those three aspects are all important to quantity, quality and location of reserves and that these things collectively seem to be more important than the current or past [284] levels of production.

Q I understand.

Professor, I assume it is your view that coal reserves differ in value.

A If I understand the question, the answer is yes.

Q What do you take to be my question?

A I take it you mean that different coal reserves differ in value from one another.

Q Yes.

A Both in terms of their value per ton, and then the number of tons available, and so on.

Q Yes.

A I suppose they also differ in value from beer.

Q Hopefully.

A I smiled in that last question, Mr. Cusack, because students are fond of making statements that involve a comparative without indicating what they compare to, and as a professor, one is continually reading examinations that say X is better, without saying what it is better than.

Q I assume then, Professor, it would be impossible to determine the market power of a coal [285] producer by looking only at the quantity, quality and location of its reserves, is this correct?

A I thought we had just, in the question back, one or two, gone through and said that no, it was not possible to look just at those; we also had to look at its organizational, financial and other capability of converting those reserves into production. But if there is a new question, would you repeat it?

Q No. That is fine, Professor. Thank you.

Sir, the mere fact that a coal producer has, in the last three or four years, increased its total coal reserves from, say 300 million tons to 550 million tons, would, I take it, not be too significant unless you knew about the quality and the quantity and the location of the reserves, and something about the organization and the firm's financial capabilities. Is this a fair statement?

A No. I think that I could not evaluate the significance of that without knowing about these other things. The significance of the reserves would depend not on my knowledge but on the facts of the reserves.

Q And the facts of the organization owning [286] the reserves, I assume?

A I am now a little bit confused. I wonder if you would state that again. Either we could have the whole thing read back, or if you would state as a complete sentence the question I am now being asked.

Q Assume a coal-producing organization increased its coal reserves substantially, say perhaps doubled in a period of three or four years. This would not necessarily, in and of itself, indicate that this coal company's market position had doubled in this period of time, would it?

A No. Of course, it does not by itself definitively determine anything.

If one assumes the company was intelligently proceeding with its business of producing, one assumes that it thought it increasing its quantity of usable reserves, and this suggests one would want to look more closely to see what the effect on its competitive and market position was.

Q It is a fair statement to say, then, that if a company increased its reserves, it has done so on the assumption that these reserves would be utilized. Is that a fair statement?

[287] A Well, I am sure that at the time it acquired them, it assumed it would be useful or profitable, yes.

Q Professor, I would like to draw your attention to the first sentence under numbered paragraph 7 of your report, on page 5, where you state:

> "The growth of mine size and the share of production by large coal producers is a direct response to the intense competition for the utility business both between coal producers and among competing fuels."

Do you have any qualification to make in regard to that sentence, Professor?

A I am not sure what you have in mind. I think the sentence is, as first sentences tend to be, an introduction to the whole paragraph, and I think that to get the meaning of the sentence and its contextual basis, one would best read the whole paragraph, and I am about to do that. If then the question is, do I want to modify the view expressed in that paragraph for which that sentence is the lead in, I will be glad to answer that, if I may have just a moment to re-read it.

Q Yes, sir. Please do.

* * * *

[292] Q Professor, are you under the impression that it is impossible for a coal producer to acquire coal reserves from another coal producer?

A No. I don't think that is impossible. I think that one of the ways one acquires those reserves is to buy the companies.

Merger is clearly—when one acquires a company via merger, one acquires all of the company's assets, and among those assets may importantly be its reserves.

Q Do you know whether it is possible for a coal company to acquire merely a portion of the coal reserves of another producer?

A I would be amazed if it were not possible to purchase specific reserves.

I would say, if I might expand on that, that since reserves seem to be the life blood of a company, a producing company that sold its reserves would be in some sense limiting its future, and it would be more likely to do that by selling its whole organization then by merely selling its future and retaining its equipment and its operating personnel.

* * * *

[303] BY MR. CUSACK:

Q Directing your attention to that time, Professor, in your opinion was United Electric a [304] firm which was heading inevitably in the direction of bankruptcy, with the grave probability that failure would ensue, that is, that the trend was irreversible?

A It is not my opinion that it was heading toward bankruptcy, in a way irreversible or other.

Q And Professor, is it your opinion that at the time in question, November of 1966, there were available to United Electric no reasonable, possible distinguishable or feasible alternatives which would have permitted United Electric to remain an independent competitive factor within the bituminous coal industry?

MR. KEMPF: May I have that reread, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A May I answer that question in two parts.

It is perfectly clear that in terms of its existing contracts, as of that time or as of this time, United Electric would continue, for a substantial period of time, to be a

producer, if it did nothing more than to produce and deliver from its existing mines on its existing contracts. [305] Nothing that I say is designed to undercut that, as I think it fact.

It seems clear that without doing something, this was a company that might have appeared not on the verge of bankruptcy, but in the process of liquidation in terms of its, as I understand it, reserve position.

I do not, in general, know all of the opportunities that might have been before it to compensate for this inadequate reserve position. I read the record as having said that the option of acquiring new strip reserves was effectively closed to it; I read the record as saying acquiring deep reserves and developing a deep mining capability independently was not effectively open to it.

I do not know, and have not investigated, whether other mergers might have been as acceptable a solution to it or as feasible a solution to it as the one that was—

If I remember the record, by that time, it seems to me, 50 per cent of its stock was already owned by either Freeman or Material Service or General Dynamics, that this process of stock acquistion did not begin in 1966 but it started ten [306] years or so earlier than that.

So without knowing what all of the possibilities were, it seems to me that the possibilities of acquiring strip reserves or acquiring underground capability, appear to not have been still available.

I do recall, in the record, a discussion of a much earlier series of discussions, perhaps going back to 1954 or 1955, of a possible merger with Truax-Traer. I take it that subsequent mergers have made that possibility no longer available to it.

BY MR. CUSACK:

Q Would you please direct your attention to page 5 of your report, sir, to the statement in the middle of numbered paragraph 7, stating, and I quote:

"The fact that coal continues to supply so much of the energy requirements of the electrical utilities

reflects the success of coal producers in delivering coal at a low cost per BTU."

Other than the electric utilities, Professor, do you know of any other fuel consumers [307] in which a choice of fuel is decided primarily on the basis of delivered Btu price of fuel?

A I think any fuel user has, as one element in his consideration, the cost per unit energy delivered. I think any producer considers other characteristics as well.

MR. HEDLUND: Did you mean to say "producer"?

THE WITNESS: Excuse me. Any consumer. Thank you.

BY THE WITNESS:

A I think the electric utilities, by virtue of their very, very heavy consumption of fuel, are particularly concerned with that. I am sure that persons who use fuel for home heating are concerned with the cost per unit of energy, but they can perhaps afford to be more concerned with the convenience in handling, with the cleanliness, and with other aspects of this. I suppose that industrial users of fuel always consider the cost per Btu as one among the many things they consider.

I recall some testimony about one producer that was manufacturing its own electricity—

MR. HEDLUND: One consumer?

[308] THE WITNESS: One consumer. Excuse me.

BY THE WITNESS:

A This was perhaps St. Louis Steel. Keystone—

BY MR. CUSACK:

Q Keystone Steel and Wire Company?

A Yes. Mr. Redard, I think, testified that at some stage they stopped consuming coal to manufacture electricity, because they were persuaded it was cheaper to purchase the electricity, and there may have been other reasons in that.

So I think my answer to your question is, I assume everyone who uses coal for the purpose of producing, he pays some attention to the cost per Btu. The question as to whether that is the single, most important

consideration or merely one among many, would presumably vary according as the fuel cost is an important cost in the final product being produced.

Q Professor, is it your opinion that coal is the lowest priced year-around fuel in delivered Btu's for the generation of electricity in Illinois?

A I think that one has to answer then the question of specific locations.

* * * *

[319] I think in any industry where there is substantial competition, that is, where there are several suppliers, a buyer is in a position to have a choice among several suppliers.

I think in those industries where the buyer possesses what would be called substantial monopsony power or oligopsony power, where it is a concentrated buyer, where it is one of a relatively small number of buyers, he, the buyer, possesses a kind of bargaining power in these negotiations that may indeed be greater than in a situation where he does not possess it.

I think to take a situation, if I remember the statistics, where Commonwealth Edison is buying 17 or 19 million tons of coal a year, it is a very big coal buyer vis-a-vis virtually all of the coal producers. It's bargaining power therefore, and its ability to put pressure on those companies to sell to it at reasonable prices, is very substantial. It is much more substantial then if it were consuming a hundred thousand tons of coal a year. I would think that if faced with the same set of suppliers, I would expect to get a better price if I were buying 17 million tons a [320] year then if I were buying a few hundred thousand or even a million tons a year.

So in this sense, comparing this against an industry that does not have that kind of buying power, I would think it would be substantial.

I would think, second, that since the utilities have alternative sources of fuel, that is a bargaining weapon that they have when they go into negotiations. When they are talking about negotiating a contract with a coal producer for supplying, let us say a new facility,

the mere threat that "Well, we can design this thing so as to use nuclear power instead, if you don't make us a reasonable price on this thing," is a further source of bargaining advantage, which is not always available in other industries.

I share Mr. Hedlund's view that I am not sure what "the average industrial situation" is. This is clearly a situation where there is significant buying power, and where, moreover, the utilities not only have buying power but seem to have substantial information. They are not, in any sense, uninformed buyers. They know what they are getting, they have presumably tested the coal, [321] they know its chemical properties, they know the engineering problems it might lead to, and what the alternatives are.

I think the evidence is replete that coal buying is one of the most important activities of electric utilities, and that therefore, since it is an important and high payoff activity, high-level talent is devoted to the problem of coal buying.

BY MR. CUSACK:

Q Do you recall any testimony, from any of the depositions or otherwise, where a gas company either approached or was approached by a public utility for the purpose of the public utility using gas as an alternative to coal?

A No, I do not.

Q Would your answer be the same for oil?

A I do not remember, in anything that I read, discussions of specific approaches by either oil or gas producers to a utility.

I do remember, although precisely where, I don't know, some of the utility people saying that at the time they constructed facilities they considered alternative fuel supplies and had that [322] as part of their basic decision.

* * * *

I would think that a large automobile company negotiating with the fifth or sixth largest steel company might have more bargaining [323] power than the fourth

largest automobile company negotiating with the first or second largest steel company; that is, even within those two industries there can be, as you know, great variance in the market occupancy. Within the automobile industry there is a tremendous difference between General Motors and American Motors; within the steel industry there is a tremendous difference between U. S. Steel than with the smaller but still substantially large steel companies.

Q So would it be true, Professor, to say that in the public utility industry and in the coal producers in the Midwest there are a number of instances where public utilities are at a much less bargaining power than some of the coal producers?

A I think I agree with what you are saying. Let me restate it, to make sure that I understand it.

It is very clear that among the utilities, as well as among the coal producers, there is substantial variance in size. I think Commonwealth Edison and TVA, being two buyers, clearly are very large companies, with substantial bargaining power no matter whom they deal with. [324] There are also many smaller utilities and many smaller coal companies. If one deals with the negotiations between a relatively small utility, small now in terms of its total fuel requirements, let us say, its bargaining power vis-a-vis Peabody or Freeman may be much less than that of TVA vis-a-vis the same producers.

So that where there is variance in size of individual firms, to characterize relative bargaining powers accurately one ought to look at individual negotiating situations. To characterize it on average, and to say that utilities as a whole have substantial bargaining power, makes sense if you are comparing it to—not to steel, where it is also complicated, but to a highly unconcentrated set of purchases, in perhaps clothing manufacture, or something of that kind.

Q On page 6, under numbered paragraph 9, the second to the last sentence is as follows:

> "Moreover, some utilities possess their own coal reserves which add to their bargaining strength."

Would you please name, sir, the public utilities in the Midwest which possess their own [325] coal reserves?

A I am not sure I can name them all. In fact, I am sure I can't.

I remember that Consolidated Edison owns certain coal reserves. I believe—

MR. HEDLUND: You meant Commonwealth Edison?

THE WITNESS: Commonwealth Edison. Excuse me.

BY THE WITNESS:

A I believe Mr. Nicoson, testifying that the Indiana Public Service utility—the precise name, I apparently don't remember—I believe he testified that they had acquired, and I believe still held, coal reserves, and that they were of some value to the company in its negotiations.

I am sure there are others. I don't, offhand, remember them.

BY MR. CUSACK:

Q Professor, directing your attention to the sentence on the bottom of page 6 of your report, under numbered paragraph 10, which is:

> "In the context of this litigation, anti-merger policy should seek to preserve [326] a sufficient number of alternative sources of supply to customers to assure competitive behavior."

Professor, does the presence of several coal producers in a position to supply a particular customer, is this needed to assure competitive behavior?

THE WITNESS: I wonder if I could have that read back.

MR. CUSACK: Let me rephrase it, and make it a little more intelligible.

BY MR. CUSACK:

Q Is the presence of several coal producers, in a position to supply a particular customer, needed to assure competitive behavior?

A I am not sure how many is the number that is required. In part, this depends on the size and bargaining power of the purchaser. One would think that typically at least two or three potential suppliers would be required if the customer did not have extraordinary bargaining power.

I am not, in just the abstract, prepared to say whether the number of competitive sources of supply a particular consumer must have should [327] be three or four or five or eight. It seems clear it should be greater than one.

* * * *

[329] MR. HEDLUND: Do you intend to use his [330] book as evidence?

MR. CUSACK: We have not decided that.

BY MR. CUSACK:

Q Professor, it is my understanding that it is your position that you cannot look at the competitive impact of a merger without looking at a certain market or markets, is this correct?

A It is my position that competition occurs in markets. It is not independent of a market or set of markets. Yes.

Q And you have to then examine some sort of a market to determine the legality of a merger. Is this true?

A I think I have said several times, and I say again: I do not think it is up to me to say how you determine the legality of a merger. There are judicial procedures for that.

I think that in order to determine the competitive effect of a merger, one has to look at where the competition takes place, and where then it is affected, and that is in one or more, and I emphasize the fact that there may be many, markets.

Q Professor, what markets, in your opinion, [331] do UEC and Freeman operate in?

A I think the principal markets they operate in involve the sale of steam coal to electric utilities for the purpose of generating electricity.

Q Where, sir, particularly?

A Within this general Midwestern area.

I think that their customers, and there are numbers of them, are in some markets—not all in the same markets. It is clear that, as we were talking about earlier, the problem of determining the source of supply to particular customers has to be looked at.

I think, if I remember the record and the data in the case, and this is now going back, that Freeman is importantly, in terms of tonnage, engaged in the metallurgical coal market, which I think is a distinguishable market. I think that both Freeman and United sell a certain amount of coal to cement companies, both sell to industrial users, and I forget how it tapers out. My best recollection is that something like 60 or 70 per cent of the coal of each of those is going into electrical generation, and the rest is distributed, [332] not necessarily evenly, among other types of users.

* * * *

A I think that statement of the question almost has the situation backwards, and I am having [333] a little difficulty getting at what you are driving at.

Whether or not two companies are in effective competition for a given supplier is whether they are practicable alternative sources of supply.

If the situation is that coal producer A in your hypothetical is offering to sell coal substantially below the price of coal producer B in that area, then coal producer B apparently is not an effective supplier at that set of prices, and might indeed not be a real alternative source of supply to a customer at that location.

I can visualize a situation at which, if coal company A is in a position to deliver at one cent per Btu or a tenth of a cent per Btu below another customer, that that is a relatively small difference in costs, and that this is then a feasible alternative. One is talking then about the size of the differential, as to whether the situation is likely to change.

What I am trying to suggest is that two coal companies, let's say located at different places, and therefore with different freight [334] schedules as they move along a railroad or move toward each other, are likely to have some zone in which their delivered prices per Btu, other

things being approximately equal, are in what I think you earlier called a price range, that is negotiable, let us say, with a particular buyer. Perhaps at the mine mouth of one plant and the mine mouth of the other there is such a wide difference in the delivered prices that there is no effective possibility of them competing for particular customers. I don't know if that is clear.

What I am saying is, it is not true that there are totally separate market areas. Between any market areas there are zones of overlap of competition for which, for some user, may make those two sources of supply close enough to one another that it pays to negotiate with each of them.

* * * *

[338] In the mine A and the mine B, the cost from mine A to facility X being $4.00, and from mine B being $4.10, assuming coal is sold from mine A to X, and coal is sold from mine B to X, that even with this price differential, this is actually going on. Would this indicate to you, sir, that mines A and B were in competition for the coal purchases of X?

A It might indicate several things, and that is one of the possibilities.

It might indicate that one set of conditions had pertained in the past, and that had led to a contract with firm B, but then the conditions and rates had changed, and a new contract had been made with A. It might mean that there were differences in the quality of the coal not visible to the statistical eye, when it recorded this price, that were important to the consumer; it might mean several things.

I would say that in general, where, in terms of current transactions, two suppliers are both supplying in a given area, one would presume that those suppliers are in fact competing in that [339] area.

* * * *

[344] I don't think that in the facts in this case we are at the point where this market structure and the size of this company is by itself so strong an indication that I would be satisfied to look at that and nothing else.

I think that this conclusion was based on looking at the whole picture, and that of course included some attention to market structure.

Q The next question I would like to discuss with you, Professor, is on page 8 of your report, and it is the following sentence:

> "Third, because of differences in the location of its mines, in the quality of its coals and in the nature of its transportation routes, Freeman and UEC have long been predominantly complementary rather than competitive producers."

Would you tell us, sir, what you mean by the term "predominantly complementary producers"?

A Let me first state what I mean by "complementary," and then we can come back, if you like, to "predominently."

It seems to me that producers are com- [345] plementary if coal from one is used to supplement coal from the other rather than to compete with it.

Remembering the record, and I probably remember it imperfectly, it seems to me there were a number of illustrations of that kind. One I recall, that when the United coal from the Mary Moore Mine ran out, it had an uncompleted contract with a utility, Vermilion Power, perhaps, and Freeman coal was shipped—I hesitate to say on my memory just from where, but Freeman coal was shipped to complete that contract which United was unable to complete from its original mine. I would consider that to be a complementary use.

I guess I would regard the shipments from United's Fidelity Mine to TVA on a Freeman contract, which were discussed at length, I think by Mr. Tarzy, and perhaps in other places as well, as a complementary usage; complementary in two senses: This was coal that was supplied on a Freeman contract that would not have been perhaps used by itself or contracted for by itself. It was also complementary in the sense—I think that was coal that, in the summer months, would have gone up the Mississippi River to Wisconsin [346] or Minnesota stations, and because of the river being closed, Mr. Tarzy, I

believe, testified they could keep the mine open by shipping it to a TVA station on the Freeman contracts.

Another complementary use concerned the possibilities of using dust from one mine, with screenings from another, to get a mixture that burned effectively. I think that in the record there was some discussion of using some dust from the Southern Illinois mines of Freeman, I think the Orient Mine, with the Fidelity screenings, in providing a mixture that was usable by—was that Union Electric Company in St. Louis? Again, my remembering of the details—

All of those seem to me to be essentially complementary uses, where basically a contract either relied on coal from one or the other, and some coal was shipped from the other company because it was possible to use on a fill-in basis in such a way as to increase the efficiency of the total operation; or a case where the coals from the two sources had to be mixed to make an effective blend.

I think there were other cases as well, [347] but those stick in my mind. It struck me, as I read it, as the sorts of efficiencies that might be found in a merger of the operations of these two companies.

Q Professor, if United Electric was able to supply the Tennessee Valley Authority, from its Fidelity Mine, with 213,000 tons of coal in 1967, with 254,000 tons of coal in 1966, and with 263,000 tons of coal in 1965 under a Freeman contract, why would not United Electric be able to supply this independently of Freeman?

A I think I recall in testimony, I may be mistaken, that Mr. Tarzy, and perhaps Mr. Nugent as well, testified that they could not do so, that TVA was not interested in contracting for Belleville coal except in conjunction with the contract from the Southern Illinois mine. But again, if my recollection of that is wrong, then the record will show it.

I think the fact is, they did not have a contract with TVA on their own at any time, but I may be mistaken on that. But that is my recollection.

Q Professor, if United Electric and Freeman [348] had been independent at the time of these shipments to

TVA under the Freeman contract, in your judgment would it have been possible for United Electric and Freeman to put in a joint bid, assuming the companies were separate?

A Economically, of course it would have been possible. I don't know what the either administrative or managerial aspects or the legal aspects are of that kind of a joint arrangement.

Q Professor, I would like to show you a chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points—1967."

A I think I may have a copy of that. Is that this chart (indicating)?

Q Yes, sir. The revised one, for 1967.

A All right.

Q I ask you to glance at this chart and direct your attention to it, and I ask you, sir:

Other than your testimony in regard to the TVA matter, and I believe you mentioned the Union Electric sales, what other sales by Freeman and United Electric here, as set forth in this chart, which is for 1967, be what you would consider to [349] be complementary sales?

A I think if we may, we had best go through the chart and divide them, and let me start by saying that I think that one has to pay attention to the facility as well as to the company. I would not regard as common sales, sales from the two firms to different facilities of the same firm.

Q Why don't we take it on facilities first.

A Fine. It seems to me then, if we start with this thing, the Caterpillar Tractor case, which is listed first, appears to be sales to different facilities, so it is not a common—

Excuse me, sir. One question on the Caterpillar.

What if Caterpillar can direct the shipments of coal to its various plants?

A I am not sure what you are asking me. I think that you must tell me more.

Is Caterpillar buying the coal at mine mouth and taking delivery there on contracts?

Q Yes. Let's assume that.

A If they are buying coal at mine mouth, and in fact characteristically mix the locations of the coal from the two mines, this would clearly [350] seem to me a case of where they regarded the two mines as substitute sources of supply that in fact were interchangeable. I have no reason to think that that is the fact with these shipments that are here involved.

Q May we go to the next one, sir.

A Yes. The next one is a Commonwealth Edison shipment. I don't know the facts of this, but suppose that that is a shipment to a common facility.

Q Yes, sir.

A And I have no reason to think it is complementary, though it may very well be a competitive shipment to that facility.

The next one is listed, Central Illinois Light Company, and appears to be—

Q Those are different facilities, sir.

A Different facilities. Right.

The Meredosia Plant is the same facility.

Central Illinois Public Service. That, when I looked at the map, looked to me like one of these places where indeed it might well be that this Meredosia Plant was on the boundary. I believe it was on the Illinois River, south of the Banner [351] Mine, and could receive down-river coal there, and it was a fairly short rail haul from the Crown Mine. That is my recollection without looking at the map.

The Meredosia Plant, then, looks to me as if it was indeed a competitive shipment, in the sense that that plant could be reached either by the Cuba-Buckheart—

Q Or Banner, sir.

A Cuba-Buckheart or Banner. That is correct. There was a substantial 160,000 tons of coal there, and there was substantial coal from Springfield.

Q And what about the Grand Tower Plant, sir, of Central Illinois Public Service?

A Well, there the quantity of coal coming up from Fidelity seems so small as almost to be de minimis. I suppose I would want to know more about that, as to

whether 16,000 tons of coal was a significant shipment. Do you have the data for other years? Is that a significant source?

Y Yes, your Honor.

A Thank you very much.

(There was a short interruption, after [352] which the taking of the deposition was resumed as follows:)

BY MR. CUSACK:

Q Professor, the 1965 schedule shows that the Fidelity Mine sold 15,000 tons of coal to the Grand Tower Plant, while the Orient No. 4 Mine sold 102,000, or actually 103,000 tons to Grand Tower, and the 1966 statistic shows that the Fidelity Mine shipped 17,000 tons of coal to Grand Tower, and the Orient No. 4 Mine shipped 100,000 tons, and the Orient No. 3 Mine shipped a little less than 17,000 tons.

A I think my question there, and it is only a question, is the kind of shipments that are by and large involved to these plants, that 16,000, 17,000 or 15,000 tons sounds like a small amount, and I truly would want to know what accounted for this rather small volume. Was this special coal, with special characteristics?

If you told me that two mines, one supplied 200,000 tons a year and another supplied 15,000 tons, was that an important area of competitive supply, it would seem to me not, unless the smaller shipment, shipment from the small mine, could readily be expanded.

[353] You understand that—

Q Yes. The smaller shipment has been relatively stable, though, has it not?

A Well, that leads me to suspect that perhaps it is used for some special purpose or has some special chemical characteristics or is mixed, or something of that kind.

I am simply saying that it is something that I would want to inquire further about, and I don't know.

Q Should we go to the next one, sir? It is Commonwealth Edison Company.

A Commonwealth Edison again, the River Stations, there is very clearly large shipment from both firms.

I think I mentioned that before, that that is a large tonnage. It probably ought to be interpreted in terms of the total purchases of Commonwealth Edison.

Q Would these tonnages be in competition, or would they be complementary, in your view?

A As far as I know, they are competitive shipments.

Q All right. The next one, Professor, is [354] Dairyland Power Cooperative, the shipments to the Alma Plant, the Fidelity Mine shipping a little over 35,000 tons, and Freeman shipping 77,994 tons.

Would you consider this tonnage to be complementary, or in competition?

A Well, I don't have any reason to think it is complementary.

Which mine is that from Freeman? Do you know?

Q We do not know, sir.

A Do you know which area? Was it from one of the Orient mines, presumably?

Q We really don't know. Perhaps Mr. Hedlund could tell us.

MR. HEDLUND: We have not checked your figures here, Mr. Cusack. This is, of course, your document, and we will do so. More than that, I cannot say at this point.

MR. CUSACK: Thank you. I understand.

MR. HEDLUND: I know neither whether the figures are accurate, nor whether they are accurate from which mines of Freeman, if from Freeman's mines that tonnage comes.

[355] But presumably, since a representative of the Dairyland Power Cooperative is going to be present to testify at trial, he can clear up any ambiguities still present.

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q The next one is the E. J. Stoneman Plant of Dairyland Power, 7,600 tons from United Electric and 26,900 tons from Freeman.

How did you view this tonnage, Professor?

A Well, again, I don't know that it is complementary.

I assume it is competitive. It is not an enormous volume, but let's suppose it is competitive.

Q The next, Professor, would be Foote Minerals Plant at Keokuk, Iowa, 24,731 tons by United Electric, and 30,881 tons by Freeman.

What would your view be on that?

A I assume that is competitive.

Q You have already testified on the Tennessee Valley Authority matter, which is on the bottom of that page.

A Right.

Q Do you have any other comments to make on [356] the Union Electric sales?

A No. I am just really—here is where I am uncertain. I remember, I think it was Mr. Nugent's deposition, his discussing the competitive situation of the Southern Illinois vis-a-vis the Belleville Coal, and if I recollect, he used this Union Electric Company as an illustration of the fact that the only reason they were competitive was that they were using dust from Southern Illinois with screenings. My memory may be way off on that, but that is my recollection, that that was the illustration, and if it is, I would think those were primarily complementary, in the term as I was using it.

Q Professor, assuming that the illustration is correct, and I am not completely clear in my own mind on it. I mean, you may well have stated it correctly according to Mr. Nugent's deposition.

Assuming that United Electric's screenings were sold to Union Electric, to identical facilities in which Freeman sold dust to these facilities, and assuming these screenings are pulverized before being used by the generating stations of [357] Union Electric, would this indicate to you that the coal, in its final use, is in competition?

A The impression I was under was that the dust was not usable without being mixed with other coal.

Now you are telling me that that assumption is not correct? You are asking me to assume something else?

Q Yes. I asked you to assume that the screenings are pulverized into a dust.

A Put another way, is an implication of that that this plant could be run entirely by dust?

Q Yes. And that these screenings end up to be dust.
A Yes.
Q They may be dust at the plant where it is consumed, as opposed to the dust coming out of the Freeman tipple.
A I think on those facts, I would conclude that they were competitors, not complementary. That was not my understanding of the facts, as Mr. Nugent testified to them.
Q Yes. The question was based on my assump- [358] tion.
A Yes.
Q The next, Professor, is the Wisconsin Public Service Company facility at Green Bay, Wisconsin, the J. P. Pulliam Plant, 131,700 tons from the Fidelity Mine of United Electric, and 123,000 tons from the Orient No. 4 Mine.
A Right.
Q How would you view this, sir?
A Well, I have a dim memory here, and this may be ridiculous, of some coal that was going to Green Bay that was brought to Chicago docks and then mixed to meet certain chemical properties, and I don't know if this is the case of that or not. If it is, I would think there would be a complementarity involved, but otherwise I would think it would be competitive, and I simply do not remember whether this was the illustration where, in order to use—

If I recall, the Wisconsin Public Service Company was interested in high Btu coal, and had been, for a long time, using primarily Eastern coal, and about this time it shifted to using perhaps 40 or 50 per cent Illinois coal and [359] 40 or 50 per cent Eastern coal, but that the Belleville coal was not of high enough Btu, the Fidelity coal, and therefore it could only be used if it were mixed with Southern Illinois coal. In that case, I would think it was distinctly complementary.

As I now talk about it, it seems to be that the facts there were that the only was in which the United Electric Fidelity coal could be used in that boiler was in an intermixed form.

Q Would you say, Professor, that the mixing of coal, say the mixing of a lower Btu coal with a higher Btu coal, would take these two types of coal out of being in competition?

A No. I would say that if one is talking about making a long-term contract for the supply of coal to service a given facility, and if I were the public utility buyer, I would want to assure myself of the fuel supply I needed. And thus, if I were going to negotiate, let's say for Fidelity coal, I would have to simultaneously negotiate for some higher Btu coal to mix with it, and for the arrangements for mixing facilities, whether at the mine or at the dock or at the plant would affect [360] this. And I would think, in the mind of the purchaser, this would be a complementary acquisition of coal, if my assumption is correct that the Fidelity coal could not be used by itself in the boilers as they then had them. And for that reason, while it would be possible to negotiate this separately with different companies, I think it would probably be a good deal easier to negotiate it with a single company that could contract to provide, and presumably guarantee to provide, not only the volume of coal but the volume of coal in appropriate mixture so it would service the boiler.

You understand on this, my knowledge is derivative. I am not really a boiler engineer, and this is the impression I have from reading the record.

Q Professor, if the Wisconsin Public Service Company, Pulliam Plant, was being altered to take all Midwestern coals, to the exclusion of Eastern coals, would these shipments by United Electric and Freeman go from the complementary category to the competitive category?

MR. HEDLUND: Do you mean by that question, [361] Mr. Cusack, in the phrase "all the Midwestern coals," each and every one, regardless of Btu content?

MR. CUSACK: Yes.

BY THE WITNESS:

A I think we are talking about two different things. We are talking about these shipments which were made to a given facility, and that is one thing we can talk about. The other is, we can talk about if they were de-

signing a new facility, in the consideration of the design for that facility could they imagine designing a facility that would take lower Btu as well as higher Btu coal. And it is clear, as I think I have suggested earlier, that in the design stage, in the negotiation stage, Wisconsin Public Service would consider, and could consider as alternatives, high Btu coal, low Btu coal, gas, oil, atomic power, any one of a number of things. I think most anything is possible.

What I do not know is whether the economics of that situation are such that they would in fact find these two coals to be close substitutes on a delivered cost basis. I think that takes me beyond my factual understanding. [362] I think, more generally, that any facility could be designed to utilize any coal if it paid to do so. I think the record shows that. The question as to whether things are effective substitutes depends on the cost in supply picture.

Q Professor, would you please glance, just for a moment, at the schedule entitled "Percent of Sales of Each Company to Identical Customer Facilities by The United Electric Coal Companies and Freeman Coal Mining Corporation for the Years 1965-1967."

(There was a short interruption, after which the taking of the deposition was resumed as follows:)

BY MR. CUSACK:

Q Based on this chart, sir, can you conclude that United Electric and Freeman were in competition?

A I think I can't tell you enough from these figures. Percentages are always interesting.

One thing it does not tell me is whether the shipments to common customers were complementary or competitive, the kind of exercise we have [363] just been through, and I suppose that if I were concerned with a competitive overlap to common customers, I would want to take out what were the predominantly complementary shipments. By themselves, I don't think I can do that.

Obviously, a substantial volume of the coal is not complementary, but I don't know just how much of it, at this point. I have not done that arithmetic.

Q Thank you, sir.
MR. CUSACK: May we confer for a second.

(Thereupon a short recess was taken, after which the taking of the deposition was resumed as follows:)

BY MR. CUSACK:

Q Professor, how do you measure accurately the quantity, quality and location of reserves held by coal producers when trying to assess competitive viability?
A I think you do some work.
I think, to put the matter this way, if I were trying to sell some coal reserves that I had, to some coal producer, coal mining company, they would pay attention to the quality of that, and [364] I assume they would do the appropriate drilling necessary to find out how much coal there was, what its chemical properties were, and so on. I would assume the transportation people would look at the kind of transportation facilities that existed, and try and figure out how they could ship that coal to either known or expected or probable customers, what kind of a rate they could get, and then make an estimate of their profit possibilities. Included in this, of course, would be a discussion of the technical or other problems in mining the coal.
I think what I am saying is that for any particular coal field, just as coal companies are in the business of buying coal acreage, coal companies or coal appraisers should be in the position of making estimates of the values of these. I don't think that is an insuperable measurement problem, but I certainly don't have the competence to do it myself, if that is what you are asking me.
Q I show you a Defendants' Exhibit entitled "Coal Reserves of Companies in Illinois, Indiana and Western Kentucky—1968."

Is it fair to say, Professor, that you [365] believe that what you have just outlined would have to be done in order to meaningfully determine the relevancy of this exhibit?

MR. HEDLUND: You are asking the relevancy in terms of what?

MR. CUSACK: The competitive relevancy. Thank you, Mr. Hedlund.

BY THE WITNESS:

A Well, I think there might be some information in the exhibit as it stands.

I think that it is possible that the relative reserve holdings give a ranking or a percentage share, that it might well be that if these reserves are distributed over similar areas and have the similar likelihoods of having thick seams or thin seams, and so on, that there might be substantial index value in this. I think that to put a precise dollar figure on these reserves, of any of them, one would have to do appraisals.

I think if one wants to compare Island Creek, which here shows something like a billion tons, with United Electric which shows 121, that looks like eight or nine times as many reserves, crudely measured. Maybe that is an index of the [366] difference in value if you appraised them, though I wouldn't be sure if you appraised them that it wouldn't turn out to be only six times as great or as much as twenty times as great. With a margin of error, I think there is probably information in them.

I suppose, if I remember the kind of exhibit the Government used in ranking coal companies by production, that there might be more information in terms of competitive viability in crude reserve figures than in crude production figures, and counsel of perfection would say, "Let's have an appraiser estimate the economic value of all of these things," but I am not sure that that is necessary to form a judgment about important magnitudes.

It seems to me reasonably clear from these figures that Peabody has a lot of coal, that this Houston Coal Company doesn't have very much, and I don't think any appraisal would change that opinion.

BY MR. CUSACK:

Q Professor, does this chart indicate to you that coal reserves are unavailable?

[367] A In the sense of coal reserves additional to these?

Q Yes.

A I don't have any idea whether, beyond these 12 billion tons here listed, there are other reserves of equivalent quality.

I suppose the one suggestion in this that makes me think that reserves of this magnitude are not readily available is the fact that a lot of companies appear to have sunk a lot of money into holding them, and I know something about the cost of money, and so do we all. If one is going to tie up money—as we were talking about earlier—in reserves that one is not going to use for some years, one presumes it is because there is a scarcity of those reserves, in the sense that it is valuable enough to have the rights to mine them in the future than to tie money up in them now.

But I don't know from this how much people paid for these reserves, and whether they paid premiums above the value of the land for other purposes.

Q Professor, would you say that on the [368] basis of this exhibit the Bell & Zoller Coal Company had substantially more reserves than United Electric?

A Well, certainly on these crude figures, it seems to be between four and five times as much.

Am I reading the right lines? Is this 550, roughly?

Q Yes.

A Against 121.

Q Would it be of interest, in determining the significance of this exhibit, if Bell & Zoller had increased its coal reserves from 300 million tons in 1965 or 1966 to 550 million tons in 1968 at a cost of approximately one million dollars?

A I am not sure what the question is. Would it be of interest to whom, for what purpose?

Q Would it be of interest to you in evaluating the importance of the coal reserves as set out in this exhibit?

A Are you telling me that there are 200 million tons of coal acquired for one million dollars?

• • • •

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

[Served December 4, 1968]

[Filed December 4, 1968]

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

STIPULATION

IT IS HEREBY AGREED AND STIPULATED by and between parties that Mr. C. C. Smith, Business Manager—Kentucky Department of Mines and Minerals, if called in this case to testify, would testify as follows:

1. The Commonwealth of Kentucky has enacted statutes governing the licensing and operation of coal mines in the Commonwealth of Kentucky.

2. The Kentucky Department of Mines and Minerals is designated by Kentucky Revised Statutes, Section 351.020(2), as the agency charged with administering all laws of the Commonwealth of Kentucky relating to mines, including coal mines.

3. The Commissioner of the Department of Mines and Minerals is designated by Kentucky Revised Statutes, Section 351.020(1), as head of the Kentucky Department of Mines and Minerals.

4. Kentucky Revised Statutes, Section 351.070(5) directs the Commissioner of the Kentucky Department of Mines and Minerals to collect statistics relating to coal mining in Kentucky and to make an annual report of such statistics.

5. The Kentucky Revised Statutes contain, among others, the following requirements for coal owners, operators or lessees:

(a) Section 351.175 entitled *Provisions concerning license to operate mine*, states:

(1) Within 45 days after January 1, 1953, and of each year thereafter, the owner, operator, or lessee of each mine shall procure from the Department a license to operate such a mine, and such license shall not be transferrable. Any owner, operator, or lessee who assumes control of a mine, opens a mine or re-opens an abandoned mine during any calendar year shall procure such license before mining operations are begun.

* * * *

(3) Requests for such license shall be made to the Department, and such requests shall be accompanied by a post office money order or cashier's check drawn in favor of the State Treasurer in the amount of fifteen dollars for each mine. When the annual report of the operator and the annual mine map, as required by KRS 351.170 and 352.450 are properly submitted, to the Department, the license shall be issued. The chief or his accredited agents shall have the authority to extend the time for the filing of the map.

(4) Any owner, operator or lessee operating a mine and who fails to obtain his license as required by this section shall be guilty of a misdemeanor and shall be fined not less than twenty-five nor more than two hundred dollars at the discretion of the court. Each day the mine is operated without a license constitutes a separate offense.

(b) Section 351.170 entitled *Reports of owner, lessee or superintendent*, states:

The owner, lessee or superintendent of each commercial coal mine shall give at the end of each month and at the end of each calendar year accurate

information, on blanks furnished by the chief, as to the number of accidents that have occurred, the number of persons employed, the tons of coal mined and any other related information that the chief requests.

(c) Section 351.990 entitled *Penalties*, states:

(4) Any coal operator who violates any of the provisions of KRS 351.170 shall be fined not less than twenty-five nor more than two hundred dollars.

6. Pursuant to the stautory provisions set forth in paragraph 5(b), the Business Manager of the Kentucky Department of Mines and Minerals, or others under his supervision, regularly sends to each commercial coal mine owner, operator or lessee in Kentucky an annual report form requesting, among other things, such statistical information as the Commissioner of the Department of Mines and Minerals is obligated by law to obtain, and any other related information that the Commissioner might request for purposes of compiling the data published annually in the Coal Section of the Annual Report of the Kentucky Department of Mines and Minerals.

7. Since 1957, the Kentucky Department of Mines and Minerals has used four different annual report forms in the solicitation of the information referred to in paragraph 5(b). While each report form contained a different variety of information requested, each did request information as to annual production statistics.

8. Since 1957, the Annual Report have also varied in that they have sometimes listed production statistics by individual mines, by county and by mining district, and in some cases, by county and mining district alone. In all years, a total production figure has been reported for the West Kentucky Coal Mining District, as defined annually in the Annual Reports.

9. The mechanics of compilation of the information contained in the Annual Reports of the Kentucky Department of Mines and Minerals is as follows. The annual report forms referred to in paragraph 5(b) are sent by the Kentucky Department of Mines and Minerals to the operators of commercial coal mines in the Com-

monwealth of Kentucky. The owner, lessee or superintendent of each such commercial coal mine who fills out the form then returns the annual report form to the Kentucky Department of Mines and Minerals. The information contained in these reports is then transcribed into work papers by clerical staff under the supervision of the Business Manager. The work papers are then transcribed into manuscript form, proofread, sent to the printer, returned in galleys, proofread, and sent back for final printing. At each stage of the compilation process, from the filling out of the annual report forms by operators to the final printing of the Annual Report, C. C. Smith would testify to the best of his knowledge that the compilation process is accurate subject to the possibility of normal clerical error inherent in such a process.

10. Mr. C. C. Smith cannot of his own knowledge testify to the accuracy, or inaccuracy, of the information required to be provided the Department on the annual report forms by the coal operators of the Commonwealth of Kentucky. In addition, neither Mr. C. C. Smith, nor other representatives of the Kentucky Department of Mines and Minerals are required by law, or make it their practice, to independently verify the accuracy, or inaccuracy, of the information provided the Department on the annual report forms by the coal operators of the Commonwealth of Kentucky.

11. Neither "tons mined" as used in Kentucky Revised Statutes, Section 351.170, nor "Total Annual Production" as used on the current annual report form are anywhere defined in the Laws Governing the Mining of Coal and Clay, Kentucky Revised Statutes, Chapters 351-352. C. C. Smith would testify that coal operators would interpret the above terms to request one of the following: (1) the total tonnage of coal removed from the ground, (2) the total tonnage of coal removed from the ground which coal is also ultimately processed, (3) the total tonnage of coal removed from the ground which coal is processed and remains after processing, or (4) the total tonnage of coal removed from the ground which coal is sold to consumers.

12. The terms "owner," "lessee," and "superintendent," the parties responsible for the giving of information requested by the annual report form under Section 351.170 of the Kentucky Revised Statutes, are nowhere defined in Laws Governing the Mining of Coal and Clay, Kentucky Revised Statutes, Chapters 351-352. This section permits any of these persons to be responsible for the filling out of the annual report form.

13. Although copies of the Annual Reports are distributed to those coal mine operators requesting such Reports, C. C. Smith cannot of his own knowledge testify to the nature and extent of the use, if any, which is, or might be made, of the Annual Reports by the coal operators of the Commonwealth of Kentucky.

14. The Annual Reports as published by the Kentucky Department of Mines and Minerals show the following tonnages reported by underground, strip, or augur methods, as tons mined, by commercial companies within the West Kentucky District:

Year	Total
1957	30,365,081
1958	28,277,469
1959	30,337,072
1960	30,403,749
1961	30,609,229
1962	31,660,499
1963	35,718,613
1964	38,031,910
1965	39,878,940
1966	41,982,473
1967	45,613,806

The West Kentucky Mining District, as annually defined in the Annual Reports, consists of the following counties: Breckenridge, Butler, Caldwell, Carlisle, Christian, Crittendon, Davies, Edmonson, Graves, Grayson,

Hancock, Henderson, Hopkins, McLean, Muhlenberg, Ohio, Union, and Webster.

If no coal is mined in one or more of the aforesaid counties in a particular year, no tonnage figures are reported from companies in such counties. In such instances the Annual Report omits the names of such counties in listing the counties reporting tonnage from the West Kentucky Mining District.

15. The published figures set forth in paragraph 14 were compiled under the supervision of the Business Manager of the Kentucky Department of Mines and Minerals from information supplied it pursuant to the statutory provisions set forth in paragraph 5(b) by the owner, lessee, or superintendent of the commercial coal mines within those counties annually defined by the Annual Reports to comprise the West Kentucky Mining District, and in some instances where the annual report forms were either not returned or incomplete, upon production figures estimated by representatives of the Kentucky Department of Mines and Minerals.

Dated: December 4, 1968

/s/ Ruben L. Hedlund
RUBEN L. HEDLUND
Attorney for Defendants
Kirkland, Ellis, Hodson, Chaffetz & Masters
2400 Prudential Plaza
Chicago, Illinois 60601

/s/ John T. Cusack
JOHN T. CUSACK
Attorney, Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604
353-6975

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632
Filed Jul 10, 1969

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

STIPULATED TESTIMONY

J. R. Sinclair, Assistant to the General Counsel, The Dow Chemical Company, Midland, Michigan, if called in this case to testify, would testify as follows:

(a) The letters to T. J. Tarzy, dated October 24, 1966, and to John T. Cusack, dated May 9, 1968, attached hereto and identified as Dow Deposition Exhibits 1 and 2 respectively, were prepared by employees of the Dow Chemical Company and the information set forth therein is true and accurate.

(b) Paragraph 4 of the letter to John T. Cusack, dated July 2, 1968, attached hereto and identified as Dow Deposition Exhibit 3, was prepared by employees of the Dow Chemical Company and the information set forth in paragraph 4 is true and accurate.

(c) The purchase agreement #2729, dated March 18, 1966, attached hereto and identified as Dow Deposition Exhibit 4, is a true and accurate copy of a duly executed contract between The Dow Chemical Company and The United Electric Coal Companies.

Dated:
July 9, 1969

/s/ Donald G. Kempf, Jr.
Attorney for Defendants

/s/ Ronald R. Futterman
Attorney for Plaintiff

DOW DEP. EX. 1

191

October 24, 1966
Mr. T. J. Tarzy
Vice President
The United Electric Coal Companies
307 N. Michigan Ave.
Chicago 1, Illinois

Dear Tom:

This will confirm the discussion during our visit with Mr. R. B. Hampson in Ludington, Michigan on October 14. Mr. Roy Parker, Power Superintendent, explained the difficulties that he had been experiencing during the summer in stockpiling United Electric's steam coal.

Primarily, his problem was one of extinguishing continual fires in his uncompacted storage piles, and this was aggravated by the sizing of the coal (1½ x 0), high moisture content, and high sulfur content. In firing the coal in his boilers, he had a hard time trying to hold loads on his units because of the surges of coal that would hit the boilers that had most of the volatile burned off, and he was trying to hold the boilers on line with char.

The sizing of the last cargo of coal in early October which was 1¼ x ¼ looked better, but Dick said that in making this double screened size it slowed down the preparation plant and they would rather not ship it. It was agreed that on the remaining two cargoes, one cargo would be cancelled, and the other cargo would be 1½ x 0 coal to be shipped the last part of October for early November arrival. This will wind up the 1966 lake season and the last year of the existing ten-year contract between our companies.

Mr. Roy Parker also stated that with the projected loads he would need to carry on his old units, Dow management has agreed that a higher grade BTU coal should be considered until such time that a new unit can be installed which would utilize a lower grade coal.

Referring to contract agreement No. 108 dated August 29, 1956 as amended August 10, 1961, this will serve as our notice of intention to terminate the contract as of the shipment of Cargo 109, the last cargo of the 1966 lake season.

Sincerely yours,

/s/ Robert F. Bassinger
ROBERT F. BASINGER
Corporate Purchasing
fns

cc: J. Corey, Ludington
R. Parker, Ludington
G. Walter, Ludington
Contract file
file

DOW DEP. EX. 2

[DOW Emblem] THE DOW CHEMICAL COMPANY

May 9, 1968

General Office Building
2030 Abbott Road Center
Midland, Michigan 40640

John T. Cusack, Esq.
Midwest Office, Antitrust Division
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois

Re: United States v. General Dynamics Corporation, et al., Civil Action No. 67 C 1632 (N.D. Ill.)

Dear Mr. Cusack:

As promised in my letter of April 24, 1968, the following is the data requested by your letter of April 15, 1968:

1. List below in 2. you will find the entire fuel purchases for The Dow Chemical Company (Ludington, Michigan) plant for the years 1964 through 1967. Consumption has been broken down into areas of power plant and lime kiln production. Total tonnage for both power plant and lime kiln production was consumed in pulverized fuel boilers.

The alternative fuel for the power plant was number 6 fuel oil used strictly on a stand by basis and only in case of an unscheduled pulverizer outage at the power plant. The annual use for the years 1964 through 1967 of fuel oil was approximately 800,000 gallons per year. The price was $.08 per gallon, F.O.B. Ludington and the purchases were from Naph-Sol of Cleveland, Ohio. Natural gas was used as a stand by fuel at the lime kiln plant. However, the volume was negligible and nominal. This stand by fuel was purchased from Michigan Consolidated Gas Company at the price of $.44 per 1,000 cubic feet.

2. The following is the summary table of the entire coal purchases for the Ludington plant for the years 1964 through 1967. A word of explanation as to the table:

a. The figures in the column "Dollar Value" under the power plant and lime kiln, are F.O.B. Ludington Michigan, figures (rail and transportation charges to Ludington included).

b. Under the column "Mine" Dow does not have a record of the actual mine from which certain purchases came, but only the name of the agent-supplier, in certain instances.

In these cases an asterisk has been placed before the name to indicate that it is an agent-supplier name rather than the mine name. All others are mine names. This mine name information can be obtained by contacting the supplier's agent, if you feel it is necessary.

Steam Coal (Power Plant)

Year	Shipper	Mine	Tonnage	Dollar Value
1964	United Electric	Banner	99,269.00	
		Buckheart	17,913.45	
			117,182.45	$832,850.76
1965	United Electric	Banner	70,384.00	$504,662.73
1966	United Electric	Banner	63,897.00	$469,707.83
1967	Pickands Mather	*Baughman	91,899	$781,056.52
		*Doverspike		
		*C. L. Amos		
		*Gem Coal		
	Pittston	Compass	12,386.30	$112,781.24
	Clinchfield	Mars		

Lime Kiln Coal

Year	Shipper	Mine	Tonnage	Dollar Value
1964	Fuel Sales	Wise Coal	16,599.55	$146,804.76
	Ind. Fuel Sales	Kelsa #2	16,333.45	$143,739.26
		*Blk. Diamond		
	M&O Coal Co.	*J. M. Jackson	223.55	
		Knox Creek	12,315.90	
		Joan Mine	4,043.30	
			16,582.75	$144,968.06
	Ohio Southern	*A. T. Massey	32,701.30	$281,551.65

Year	Shipper	Mine	Tonnage	Dollar Value
1965	Fuel Sales	*Wise Coal	25,142.80	$219,965.09
	Grundy Fuel	*Wellmore	25,944.00	$221,510.42
	Ind. Fuel Sales	D.J.B. Mine	4,672.30	
		Wolfpen	1,235.25	
		Levisa River	1,993.85	
		Blk. Diamond	18,563.85	
			26,465.25	$233,301.62
	M&O Coal	Booth Coal	1,941.35	
		Fox Mine	287.25	
		Piedmont	267.60	
		Conley	4,923.30	
		Rich Creek	1,217.70	
	M&O Coal	*Ind. Fuel Sales	156.60	
		Knox Creek	12,736.70	
		*Logan & Kanawha	53.70	
		*A. T. Massey	1,424.95	
		Peerless Eagle	1,541.00	
		Joan Mine	1,351.80	
			25,901.95	$218,336.99
	Ohio Southern	*Black Star	26,291.70	$225,422.99
		*A. T. Massey		
		*Neeley & Gibson		
1966	Black Star Carbon Fuel	Henry Clay	14,407.50	$129,427.64
		Blue Crystal	9,299.25	$ 89,248.36
		#9		
	Gem Coal Co.	Nampa Mine	4,441.65	
		Old Gauley	4,584.00	
		Conley Mine	3,765.05	
		Hull Mine	2,740.35	
			15,531.05	$140,893.09
	Grundy Fuel	Wellmore	17,654.70	
		Home Creek	3,042.95	
		Southwestern, Va.	60.30	
			20,757.95	$193,614.33
	Pickands Mather	*Berwind Fuel	24,542.05	$228,082.30
		*A. T. Massey		
		*Pittston		
		Clinchfield		
		Bull Creek		

Year	Shipper	Mine	Tonnage	Dollar Value
1967	Carbon Fuel	#9 Blue Crystal	11,733.95	$116,983.08
	Gem Coal	Terry Eagle	6,059.80	
		Conley Mine	1,630.55	
		Ottawa	139.80	
		Esco	1,185.25	
		Old Gauley	1,335.30	
		Card Mine	2,118.15	
		D.J.B. Mine	2,451.15	
			15,920.80	$140,893.09
	Grundy	*Booth Coal	22,386.80	$211,725.12
	Pickands Mather	*Lester Coal Pikeville	14,630.25	$141,997.15

I have been informed that Dow has no studies or estimates as to the feasibility of immediate conversion from coal to another energy source.

If further explanation is needed on any of the above, we will be happy to comply upon request.

Sincerely yours,

/s/ Walter D. Bradley
WALTER D. BRADLEY
Attorney

DOW DEP. EX. 3

[DOW Emblem] THE DOW CHEMICAL COMPANY

July 2, 1968

General Office Building
2030 Abbott Road Center
Midland, Michigan 40640

John T. Cusack, Esq.
Midwest Office, Antitrust Division
Department of Justice
Room 2554 United States Courthouse
Chicago, Illinois 60604

Re: United States v. General Dynamics Corporation, et al., Civil Action No. 67 C 1632 (N.D. Illinois)

Dear Mr. Cusack:

• • • •

4. Our discontinuance of coal purchases from The United Electric Coal Companies was a result of an up-grading of coal specifications at our Ludington, Michigan, location. Attached is a letter dated October 24, 1966, from Mr. R. F. Basinger to Mr. T. J. Tarzy of The United Electric Coal Companies setting out our reasons for the discontinuance.

Very truly yours,

/s/ J. R. Sinclair
J. R. SINCLAIR
Assistant to the General Counsel

DOW DEP. EX. 4

THE DOW CHEMICAL COMPANY

Purchase Agreement No. 2729

Date March 18, 1966

Period 1966 Lake Season

The Dow Chemical Company agrees to buy and seller agrees to sell the following material(s) under the terms and conditions herein specified.

Seller: The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Attention: Mr. Thomas J. Tarzy

Using Locations: Ludington—Steam Coal

Material, Quantity and Specifications: 70,000 Net Tons (approx.) of washed 1½ in. x 0 in. coal, with a 25 percent maximum ¼ in. x 0 in. carbon from sellers No. 2 Seam Banner Mine at Banner, Illinois. To be delivered during the 1966 lake shipping season via all water route and to be delivered uniformly over the shipping season.

Price and Package: Price to be $0.3012 per M BTU all on an "as received" basis; F.O.B. our docks at Ludington, Michigan, as sampled and analyzed by Commercial Testing and Engineering Company at lake transfer point in South Chicago.

Shipping Point and Freight:

Payment Terms: Net 20th Prox.

Shipping and Billing Instructions: Lake barge F.O.B. our docks.

This agreement does not authorize delivery or payment for any material. Individual purchase orders or purchase orders with releases will be issued by the using locations for specific quantities and delivery dates. Invoices should

be sent in accordance with instructions on the purchase orders.

General Terms: This agreement is subject to the General Terms and Conditions set forth on the reverse of this sheet.

Special Conditions: Shipments of coal to be via standard barge to a South Chicago lake-front dock and there transferred to a lake barge equipped with unloading facilities of your selection, for delivery to Ludington, Michigan. Notify G. W. Walter by wire or phone, date of each shipment from South Chicago at least 7 days prior to each shipment.

Accepted:

/s/ Thomas J. Tarzy
Authorized Signature
Vice Pres.
Title

THE DOW CHEMICAL COMPANY

/s/ Robert F. Basinger
Authorized Signature

ROBERT F. BASINGER
Title
Fuel Buyer
Corporate Purchasing

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

STIPULATION

Mr. George H. Shipley, President, The Carter Oil Company, Houston, Texas, if called to testify in this case, would testify as follows:

(a) Prior to becoming president of The Carter Oil Company, he was general manager of the Coal and Shale Oil Department of Humble Oil and Refining Company.

(b) Carter Oil Company is a wholly owned subsidiary of Humble Oil and Refining Company, the principal operating subsidiary in the United States of Standard Oil Company (New Jersey).

(c) He has had an active part in the overall responsibility of acquiring Humble's coal reserves and in managing Humble's entry into the business of mining and sale of coal.

(d) By the end of 1968, Humble had invested approximately $20,000,000 in acquiring coal reserves in Wyoming, Colorado, Montana, North Dakota and Illinois, and Humble and Carter have been spending approximately $11,000,000 annually on activity relating to coal. Of this amount, approximately one-half pertains to activities related to Illinois coal reserves.

(e) Humble's acquisition of coal reserves was prompted by its long range need for supplemental sources of hydrocarbon raw materials, and Humble would not have been interested in acquiring coal reserves solely for the

purpose of becoming a supplier of coal to utility and industrial markets. However, Humble intends to be a long-term supplier of coal to Illinois utilities and perhaps others.

(f) Humble and Carter have acquired, directly or through trustees, coal rights in several hundred thousand acres in Illinois. The first acquisition of coal reserves in Illinois was made in November of 1965, and the bulk of the Illinois reserves were acquired during 1966.

(g) Monterey Coal Company, a subsidiary of Carter Oil Company, began construction of a coal mine in 1969 near Carlinville, Illinois, in Macoupin County. This mine will be an underground mine, having a slope for removal of coal and a shaft for ingress and egress of personnel. The total cost of this mine will be between $10 and $20 million, which does not include the cost of acquiring coal reserves. This mine presently has coal reserves to support a producing rate of approximately 3,000,000 tons of coal per year for between 20 to 30 years. In 1969 Carter entered into a long-term contract to supply, beginning in late 1970, coal to Commonwealth Edison Company. By the early or middle 1970's, approximately 3,000,000 tons of coal per year will be supplied to the power generating units of Commonwealth. Coal will be delivered to Commonwealth at the mine. This contract was assigned by Carter to the Monterey Coal Company. Monterey may have other customers for coal from this mine. In the acquisition of the Illinois coal reserves, Humble used information from many sources, including, among others, the Illinois State Geological Survey, and used such information in drilling for coal.

(h) Humble's decision to acquire coal reserves was made in 1965. The decision to operate a coal mine was made in 1968.

(i) None of the coal reserves acquired in Illinois by Humble or Carter are suitable for strip mining. Humble was looking for coal reserves in blocks of a minimum of approximately 100,000,000 tons each for future development of hydrocarbon raw materials. Upon investigation, Humble concluded that strippable coal reserves were not available in blocks of a minimum of approximately 100,-

000,000 tons. To justify opening a new mine Humble requires enough coal reserves to profitably support a mine life of between 20 to 30 years for underground mining. Coal reserves of the mine near Carlinville are at a depth of approximately 300 feet or more. Other reserves acquired in Illinois range in depth from 300 to 1,000 feet.

(j) Humble has no prior coal mining experience. Monterey is hiring competent coal executives and personnel to staff its coal mining operations. The new Illinois mine will employ more than 300 people.

Dated: July 10, 1969

/s/ Donald G. Kempf, Jr.
Attorney for Defendants

/s/ John T. Cusack
Attorney for Plaintiff

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION ET AL., DEFENDANTS

STIPULATED TESTIMONY OF GEORGE B. KNECHT

George B. Knecht, Purchasing Agent of the Standard Lime and Refractories Company, division of Martin Marietta Corporation, Baltimore, Maryland, if called in this case to testify, will testify as follows:

(a) Standard Lime and Refractories Company operates a facility in McCook, Illinois, which manufactures two products at the present time, dead burned dolomite and dolomitic lime. Dead burned dolmite is used by steel makers as a lining material for open hearth furnaces. Dolomitic lime is used as a fluxing agent in the steel making processes during the conversion of iron ore to slag.

(b) The McCook plant operation should be considered part of the metallurgical industry since both of the plant products are used by the steel industry.

(c) The steel industry requires that both dead burned dolomite and dolomitic lime meet a specific sulfur content.

(d) Coal with a sulfur content of greater than 2.3% cannot be used by Standard Lime and Refractories Company at its McCook, Illinois facility at the present time. Based upon conversations with coal producers and the

information contained in the Keystone Coal Buyers Manual, it was determined that The United Electric Coal Companies did not at the present time have sufficient low sulfur coal (less than 2.3%) to meet the McCook facility requirements and has never been contacted to supply this facility with coal.

(e) The letters addressed to him from the Capitol Fuel Company (dated September 22, 1966), Old Ben Coal Corporation (dated September 23, 1966), Peabody Coal Company (dated September 27, 1966), Sahara Coal Company, Inc. (dated November 18, 1966), Blue Diamond Coal Company (dated February 9, 1967), Freeman Coal Mining Corporation (dated March 1, 1967), Bell & Zoller Coal Company (dated March 14, 1967), and Pittston Clinchfield Coal Sales Corporation (not dated), all of which are attached hereto and identified as Knecht Deposition Exhibits 1 through 8, respectively, were received by him in the ordinary course of business in response to inquiries directed to the authors of said letters regarding the possible sale of coal to Standard Lime and Refractories Company.

(f) The schedule entitled "COAL PURCHASES", attached hereto and identified as Knecht Deposition Exhibit 9, was prepared by him during the ordinary course of business and the information set forth therein is true and accurate.

(g) The document marked Knecht Deposition Exhibit 10 is a true and accurate copy of a contract entered into between Freeman Coal Mining Corporation and Standard Lime and Refractories Company on March 1, 1967.

(h) There are many lime products produced by the same basic process as used in the McCook plant that need not adhere to a specific sulfur content.

(i) He is of the opinion that ownership by General Dynamics of both The United Electric Coal Companies and Freeman Coal Mining Corporation has had no adverse effect on Standard Lime and Refractories Company.

(j) Since he came with Standard Lime in 1946 oil or gas has never been as economical as coal to fuel the

McCook plant kilns and therefore neither fuel has been used for the purposes for which coal is used at this plant.

Dated: September 3, 1969

/s/ Donald G. Kempf, Jr.
DONALD G. KEMPF
Kirkland, Ellis, Hodson, Chaffetz & Masters
Prudential Plaza
Chicago, Illinois 60601
Attorney for Defendants

/s/ John T. Cusack
JOHN T. CUSACK
Attorney, Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604
353-6975

KNECHT DEP. EX. 1

THE CAPITOL FUEL COMPANY

[SEAL]

Telephone
621-8200

LEADER BUILDING

CLEVELAND, OHIO 44114

September 22, 1966

Standard Lime & Refractories
Mr. George B. Knecht, Purchasing Agent
2000 First National Bank Building
Baltimore, Maryland

Dear Mr. Knecht:

We are very pleased to learn that you plan to start lime production at your McCook, Illinois plant in January, 1967.

We are very much interested in supplying the 25,000 tons of Alma seam coal you expect to consume during 1967. We shall keep in touch with you and make a written offer about November 1st.

We have checked a freight rate of $5.11 per net ton to McCook, Illinois.

With kindest regards.

Very truly yours,

THE CAPITOL FUEL COMPANY

/s/
President

KNECHT DEP. EX. 2

OLD BEN COAL CORPORATION

[SEAL]

10 South Riverside Plaza, Chicago, Illinois 60608,
DEARBURN 2-2360

September 28, 1966

Mr. George B. Knecht, Purchasing Agent
Standard Lime and Refractories Company
2000 First National Bank Building
Baltimore, Maryland 21208

Dear George:

I was most pleased to receive yours of September 19 indicating some interest in our 1½" industrial screenings on which we quoted you earlier in the month.

Now, in line with your request for larger sized coal in the winter months for easier handling, we are pleased to quote you the following:

3 x 1 size	—	$5.25
1½ x 10 mesh	—	4.85

You can expect the quality in the above two sizes to be equivalent to that quoted you on industrial screenings. As indicated to you in Baltimore, the reason for the price differential is that in the large midwestern mines, which are geared to volume loading, it is quite costly to screen coal and also the resulting sizes must be disposed of.

Hoping this is the information that you desired and looking forward to the opportunity of serving you, I remain.

Yours very truly,

/s/ William P. Darst
WILLIAM P. DARST
Assistant Vice President, Sales

WPD:rc

KNECHT DEP. EX. 3

PEABODY COAL COMPANY
332 South Michigan Avenue
Chicago, Illinois 60604

Area Code 312
Telephone 427-6450

September 27, 1966

Mr. G. B. Knecht
Purchasing Agent
Standard Lime & Refractories Co.
Baltimore, Maryland 21233

Dear Mr. Knecht:

In reply to your recent inquiry, none of our Midwestern coals can meet the 1% sulfur and 4.55 ash limitations designated by you.

In the Indiana fields our Old Glory Brazil Block seam coal on an as-received basis averages about 15% moisture, 6½% ash, and 1.4 sulphur. Chieftain #7 seam about 15% moisture, 8.29 ash, and 1.2 sulfur. These coals originate on the NYC and Milwaukee Railroads and move on a $2.41 rate for 2,500-ton volume shipments, $2.93 in 1,000-ton increments, and $3.43 in single carlots.

Our Northern Illinois Mine near Braidwood in Kankakee and Will Countys has a centrifuged and heat-dried carbon averaging 15% moisture, 6.6 ash, and 2.3 sulphur. Freight rate $1.57 for 2,500 tons, $2.09 for 1,000 tons, and $2.59 for single cars.

Our good Utility Southern Illinois screenings average 8% moisture, 8.3 ash, and 2.4 sulphur. All of these coals will meet the 36% to 40% volatile limitation.

Perhaps you can arrange trial shipments for each or all of the above coals and get actual operating data at your

McCook, Illinois plant. Mine prices for the various coals can be arranged for at that time.

Your further consideration shall be appreciated.

Yours very truly,

/s/ L. B. Girard
L. B. GIRARD
Vice President-Sales

LBG:ek

[SEAL]

KNECHT DEP. EX. 4

SAHARA COAL COMPANY, Inc.
59 East Van Buren Street
Chicago • 60605

HARRY EGGERT
Sales Manager
STEWART BYRNE
Asst. Sales Manager
Domestic Sales
HOWARD HERDER
Asst. Sales Manager
Industrial Sales

November 18, 1966

Mr. G. B. Knecht
Standard Lime & Refractories Co.
2000 First National Bank Building
Baltimore 3, Maryland

Dear Mr. Knecht:

Re: McCook, Illinois Plant

We wrote you on September 22 with preliminary information on our No. 5 Seam Saline County, Southern Illinois coal. We also told you we had a sample in the laboratory for ultimate analysis. We are attaching Commercial Testing & Engineering Company's report No. CH-342018 which is a proximate and ultimate analysis.

After you have studied this analysis and if it meets your requirements we will be glad to give you further information and also submit our F.O.B. mine price. We would also be glad to call at your McCook plant for a further discussion if you think it desirable.

Yours very truly,

/s/ Howard Herder
HOWARD HERDER
Assistant Sales Manager
Industrial Sales

HH:jw

KNECHT DEP. EX. 5

BLUE DIAMOND COAL COMPANY
P. O. Box 10050
Knoxville, Tennessee 37919
Area Code 615 — Phone 500-0511

[SEAL]

REX L. ROUSH
Industrial Sales Mgr.

February 9, 1967

Mr. George B. Knecht, Purchasing Agent
Standard Lime and Refractories Company
1900 First National Bank Building
Light and Redwood Streets
Baltimore, Maryland 21202

Re: *McCook, Illinois Plant*

Dear Mr. Knecht:

Have your plans at this plant progressed to the extent that you now know whether or not you will be needing a quality coal such as Leatherwood Washed and dried Nut and Slack? If so, we would have available for prompt shipment a sizeable tonnage that could be earmarked for you, to assure you of continuity of supply for many months to come.

It would be a pleasure hearing from you. The price structure here would be the same as at the Woodville, Ohio plant and that is $5.00 for 25% fines, and $4.85 for 35%.

Sincerely yours,

/s/ Rex Roush
Industrial Sales Manager

RLR:jc

CC: Mr. Olin Knott, Pyro Engineer

KNECHT DEP. EX. 6

[SEAL]

FREEMAN COAL MINING CORPORATION
A Division of General Dynamics Corporation

March 1, 1967

Mr. G. B. Knecht, Purchasing Agent
Standard Lime & Refractories
2000 First National Bank Bldg.
Baltimore, Maryland 21208

Dear Mr. Knecht:

Thank you for your recent telephone call suggesting we furnish some specific thoughts on a formal contract protecting the coal requirements of your McCook, Illinois plant. In this connection, we would like to make the following proposal.

For either a three or five year contract, we offer Orient No. 5 Mine 1½" x 10 Mesh Washed Screenings at $4.60 per net ton mines, and for any months you may specify Orient No. 5 Mine 3" x 1" Washed Nut at $4.85 per net ton mines. This is the coal presently being supplied. It appears to be well suited for your present purpose because of its strength which must be reflected in added production economy. Sulphur in this coal is higher than Orient No. 3, but still reasonable. Specifics on this coal were outlined in Mr. B. R. Gebhart's letter dated September 22, 1966.

In the event the McCook Plant converts to metallurgical type lime production and sulphur in the coal becomes a factor, the proposed contract would offer Orient No. 3 coal on an and/or basis. This would provide you with a coal in the range of 1.1% sulphur. Price on this coal will be the same as quoted on No. 5 Mine coal. All prices are subject to applicable taxes and wage and hour provisions as outlined in our standard form contract. I am attaching contract forms filled in as proposed in my letter with the exception of duration. This you may complete or we will if all else meets with your approval.

I feel sure you are aware of the present day coal market through your procurement activities in other plants. With this in mind, I strongly recommend the protection a contract can give, not only price but supply. Thank you again for your interest in this matter as well as for all the past tonnage we have shipped your McCook Plant. It is our sincere hope that our fine relationship will continue for many years.

Yours very truly,

/s/ G. A. Roberts
G. A. ROBERTS
Sales Manager

GAR:sw

KNECHT DEP. EX. 7

[SEAL]

BELL & ZOLLER
COAL COMPANY

200 South La Salle St., Chicago, Ill. 60604, Central 6-4222

March 14, 1967

Mr. George B. Knecht, Purchasing Agent
Standard Lime & Refractories Division
of Martin-Marietta Corporation
2000 National Bank Building
Baltimore, Maryland 21203

Dear M. Knecht:

Attached is our data sheet covering a quotation of 15,000 tons of ZEIGLER Superwashed 1½" x 23 Mesh Heat Dried Screenings with the sulphur requirement of the McCook Plant. We have revised the price quoted in June 1966, from $4.45 per net ton, f.o.b. mine to $4.60 per net ton, f.o.b. mine, which reflects the market change during this period.

Thank you very much for your interest.

Yours truly,

/s/ S. M. Rogers
S. M. ROGERS
Vice President

SMRogers/gs

Enclosure

Date: March 14, 1967

ZEIGLER

Shipper:	Bell & Zoller Coal Company 208 South LaSalle Street Chicago, Illinois 60604
Shipping Point:	Zeigler Mine, Illinois
Originating Railroad	IC-MOP-C&BI-CB&Q
Name of Mine:	Zeigler #4
Location:	Zeigler Mine, Williamson County, Illinois
Type of Mine:	Slope
Mine Capacity:	6,000 tons per day
Seam:	No. 6
Amount of tonnage offered:	Maximum of 15,000 tons
Size of Coal:	Superwashed 1" or 1½" x 28 Mesh Heat Dried Screenings
Price per net ton, f.o.b. mine:	$4.60
Present published freight rate:	$3.80—Single car rate. $3.30—Volume car rate-minimum of 1,000 ton

ANALYSIS:	As Received	Dry
Moisture	8.70	
Volatile	33.45	36.64
Carbon	51.55	56.45
Ash	6.30	6.90
Total	100.00	100.00
Sulphur	1.20	1.30
B.t.u.	12,350	13,527
Ash Fushion	2350°	
Grindability	63	

SCREEN ANALYSIS (1" x 28 Mesh)	
1" x ½"	37%
½" x ¼"	38
¼" x 28 M	25
Total	100%

The above offer is subject to the same conditions as those stipulated in our contract, especially the one with respect to the wage agreement. It is also subject to any applicable federal, state or local taxes.

KNECHT DEP. EX. 8

[SEAL]

PITTSTON CLINCHFIELD COAL SALES CORP.
17 Battery Place, New York, N.Y. 10004
Telephone (212) 944-4200

S. R. PURSGLOVE
Vice President

Mr. George B. Knecht
Standard Lime & Refractories Co.
2000 First National Bank Bldg.
Baltimore, Maryland 21203

Dear M. Knecht:

Enclosed are mine data sheets for our Kentland and Spruce Fork Mines. The Kentland-Elkhorn Coal Corp. is now a wholly owned subsidiary of our company. The Kentland Mine produces a washed coal and Spruce Fork Mine a raw coal.

As I mentioned to you on the telephone, the Kentland Mine is now almost 100% involved in the metallurgical market and is priced accordingly. Low vein mining, a large proportion of high ash Bone production and high washing costs make this a high cost operation and necessitated our putting the coal in the higher priced metallurgical market for the mine to operate at all.

Your operating people might be interested in the possibility of using the raw coal from the Spruce Fork Mine. Spruce Fork meets your specifications except for the ash and volatile matter.

In any event we offer all this coal, subject to prior sale, for your use in the amount of 25,000 tons for the calendar year beginning January 1, 1967, at the following prices, f.o.b. mine:

		Per Net Ton
Kentland Mine:	Washed Coal 1¼" x ¼"	$6.25
	Washed Coal 1¼" N/S	$6.25
Spruce Fork Mine:	Cr. M/R	$4.40

The freight rate from both mines to your plant at McCook, Illinois is $5.11 per net ton on a single car basis and $4.82 per net ton when shipped in 2,000 ton quantities.

On the telephone you mentioned an interest in Illinois coal. We combine with a low sulphur coal mined by Old Ben Coal Corp., 10 South Riverside Plaza, Chicago, Illinois, on some metallurgical business.

This coal has characteristics very similar to those given in your specifications. I mention this in the event you have any interest because of the lower freight rates.

Thank you for your inquiry.

Yours truly,

/s/ S. R. Pursglove
S. R. PURSGLOVE
Vice President

enc.

KNECHT DEP. EX. 9

COAL PURCHASES

1963		56,960 tons
1964		67,045 "
1965		59,690 "
1966		51,854 "
1967—Orient #3		25,462.55
	Orient #5	21,812.99
1968—Orient #3		23,492.15 (from 1/2/68 to 6/1/68)

Object to: Obtain a dependable source of low sulphur coal (around 1% sulphur) of a sizing 3" x 1" during winter season, 4 to 5 winter months and 1¼" x 10 mesh during summer months.

Estimate 25,000 ton requirement of low sulphur annually.

Freeman Coal Mining Corp.			Frt.	F.O.B. McCook
Orient #5 mine	1¼" x 10 mesh	$4.60 N.T. F.O.B. mine	+ $3.30x	$ 7.9
	3" x 1" washed nut	4.85 N.T. F.O.B. mine	+ 3.30x	8.15
Orient #3 mine	1¼" x 10 mesh	4.60 N.T. F.O.B. mine	+ 3.30x	7.90
(low sulphur)	3" x 1" washed nut	4.85 N.T.	+ 3.30x	8.15

x Freight rate 1000 ton trainloads

See attached letter of March 1, 1967

Old Ben Corporation

Illinois #6 Seam	1¼" x 10 mesh	4.85 N.T.	+ 3.30	8.15
	3" x 1" size	5.25 N.T.	+ 3.30	8.55

Price both low sulphur and over same—per phone Mr. Darst on 3/13/67

See attached letter of September 23, 1966

Bell & Zoller Coal Co.

	1¼" x 28 mesh	4.60 N.T. F.O.B. mine	+ 3.30	7.90

Cannot furnish 3" x 1" size

Also sold out for year—per phone 3/14/68

Attached is letter of March 14, 1967.

		Frt.	F.O.B. McCook
Sahara Coal Co.			
	Sulphur range too high for lime production.		
	No tonnage available.		
Peabody Coal Co.			
	No low sulphur coals available.		
	Other coals—moisture content too high.		
Pittston Clinchfield Coal Sales			
	Kentland		
	1¼" x 1/4	6.25 N.T. + $4.82	$11.07
	Spruce Fork	4.40 N.T. + 4.82	9.22
Blue Diamond Coal Co.			
	Leatherwood	5.00 N.T. + 4.82	9.82
The Capitol Fuel Co.			
	Alma	4.85 N.T. + 4.82	9.67
Consolidation Coal Co.			
	Sold out—possibly later	6.00/N.T. Frt. Rate	
General Coal Co.			
	None available.		
Youghiogheny & Ohio Coal Co.			
	1¼" x 10 mesh—not available.		
Berwind White Coal Co.			
	Nothing available.		

Ltr Ltr 24 TC

320 WEST WASHINGTON STREET CHICAGO 6, ILLINOIS

1703

AGREEMENT, entered into this 1st day of March, 19 67, between FREEMAN COAL MINING CORPORATION, a Division of General Dynamics Corporation, of Chicago, Illinois, (hereinafter referred to as "Seller"), and Standard Lime & Refractories of Baltimore, Maryland (hereinafter referred to as "Buyer").

The Seller hereby agrees to sell and deliver, and the Buyer agrees to purchase and accept, coal of the kind and quality, at the price and on the terms and conditions as hereinafter set forth:

QUANTITY AND GRADE OF COAL: Approximately 50,000 tons per year
Orient No. 3 fine and/or Orient No. 5 fine 3" x 1" Washed Nut and/or 1½" x 10 Mesh Washed Screenings.

RATE OF SHIPMENT: To be made in approximately equal monthly quantities, commencing April 1, 1967 and ending March 31, 1972

PRICE: 4.85 - 3" x 1" Nut
$ 4.60 - 1½x10 M. per net ton of 2,000 lbs. f.o.b. Mines from which coal is to be shipped.

TRANSPORTATION AND EQUIPMENT: The Seller will load the coal into open railroad cars at such Mines, if such cars are there for that purpose, and consign to Standard Lime & Refractories, McCook, Illinois

but the Seller shall be under no obligation to supply railroad cars, and readiness by it to deliver said Coal at such Mines shall constitute performance of this contract by it.

TERMS OF PAYMENT: Cash or Chicago Exchange by the tenth of the month following the month of shipment.

STIPULATIONS:

(a) All deliveries are subject to delays caused by strikes, lockouts or other labor troubles, embargoes, accidents, or unavoidable interruptions in operation of mines from which coal is to be shipped, or other causes beyond control of Seller. In the event of any of the above contingencies or if at any time for any cause total mine output falls below sum total of deliveries called for by all of its contracts, Seller may pro-rate deliveries in fair proportion among all contracts and orders previously accepted. If delivery for any month, or part thereof, is prevented or reduced by any contingency mentioned above, Seller shall be wholly released from all liability for the unfilled portion of such month's delivery, and, at Seller's election, such unfilled portion may be delivered during the succeeding months or the total amount of coal herein contracted for may be reduced by the amount of such unfilled portion.

(b) In case of strikes, fires, accidents, or for any other cause or reason beyond the control of the Buyer, which wholly or in any material part stop the operations of the Buyer, shipments contracted for shall be suspended or partially suspended, as in Seller's sole judgment and discretion the case may require upon written or telegraphic notice to Seller within twenty-four hours after such occurrence of the exact nature, extent and probable duration thereof; any and all coal theretofore loaded in cars consigned to Buyer or in transit upon receipt by Seller of such notice will be taken and paid for by Buyer, as well as any coal delivered by Seller to Buyer prior to receipt by Seller of such notice.

(c) Such interruption of deliveries, as mentioned herein, shall not invalidate the remainder of this contract, but on the removal of the cause of the interruption, delivery shall be continued at the specified rate; PROVIDED that deficiencies caused by the interruption shall not be made up by the Seller unless Seller so elects.

(d) The purchase price of the coal specified herein is based upon the present cost of mining and of labor at such mines, and the price herein shall advance or decline correspondingly with any increase or decrease in the present cost of labor or other costs of production of the coal shipped hereunder.

(e) In the event that any State, Municipal or Federal excise, stamp, severance, sales, occupation, use or other tax, assessment, license fee or other charge shall be levied, assessed, or charged on or for the mining, severance, production, removal, preparation, sale, occupation of selling, use, shipment, consignment or billing of said coal, or on the instruments or documents evidencing the same, or on the proceeds thereof, or on the Seller on account of the mining, severance, production, removal, preparation, sale, shipment or consignment of said coal, or in the event Seller shall contribute to any established or to be established welfare fund, hospitalization program, pension plan, or like or similar expenditure, whether imposed by operation of law or by management and labor agreement, or otherwise, then in any such event the price hereinbefore mentioned shall increase to an amount sufficient to cover said tax, assessment, license fee, contribution or other charge.

(f) If Buyer fails to make any payment as it becomes due hereunder, or fails to accept coal as specified herein, or if Buyer breaches any of the terms or conditions of this agreement, Seller may, at its option, without notice, suspend further deliveries hereunder and cancel this agreement without being liable for any claims or damages whatsoever, or Seller, may at its option treat this contract for any or all undelivered coal as broken by Buyer, who shall be liable for all damages incident thereto, without any further tender, delivery, or act by Seller; failure to exercise any such option in any instance shall not be considered as a waiver of such option in regard to subsequent defaults. If in the judgment of the Seller the financial responsibility of the Buyer shall at any time become impaired and written notice be given by the Seller to the Buyer, the Seller shall have the right to suspend further shipments until adequate security for payment hereunder is furnished by Buyer.

(g) The Buyer will pay all freight and other transportationcharges, together with any transportation tax thereon, on said coal, unless otherwise expressly stated herein, and the railroad scale weights at the usual point of weighing are to be accepted as correct and are to govern the settlement in the case of all rail deliveries. A certificate of the Scale Master shall be conclusive evidence of the weight of coal delivered to the Buyer.

(h) There are no understandings or agreements relative to this contract or its subject-matter not fully expressed herein, and no agent or salesman has any authority to obligate the Seller by any terms, stipulations or conditions not herein expressed. There may be no modification of this agreement, except in writing, signed by the parties hereto.

(i) This agreement shall be construed in accordance with and governed by the laws of the State of Illinois. Should any part, term, or provision of this agreement be invalid under the laws of any state, political subdivision thereof, or jurisdiction where used, the validity of the remaining parts, terms or provisions shall not be affected thereby.

868

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed in duplicate by their respective officers duly authorized the day and year first above written.

Seller: FREEMAN COAL MINING CORPORATION
A DIVISION OF GENERAL DYNAMICS CORPORATION

By

Buyer: STANDARD LIME & REFRACTORIES

By

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

[Received Sep. 18, 1969, Elbert A. Wagner, Jr. Clerk, United States District Court]

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION, ET AL., DEFENDANTS

STIPULATED TESTIMONY

David G. Hemminger, Attorney, The Proctor and Gamble Company, Cincinnati, Ohio, if called in this case to testify, would testify as follows:

(a) Prior to 1969, the St. Louis, Missouri manufacturing facility of the Proctor and Gamble Company consumed approximately 15,000 tons of coal per year to produce electrical power and heating.

(b) The St. Louis facility has been converted from coal burning to gas burning as a result of the St. Louis air pollution ordinance restricting the sulfur content of coal burned to less than 1%. The St. Louis facility had been burning coal with a sulfur content of 5%.

(c) The company continues to burn coal at its Chicago, Illinois facility.

Dated: September 17, 1969

/s/ Donald G. Kempf
KIRKLAND, ELLIS, HODSON,
CHAFFETZ & MASTERS
Prudential Plaza
Chicago, Illinois 60601
Attorney for defendants

/s/ John T. Cusack
JOHN T. CUSACK
Attorney, Department of Justice
Room 2634 U.S. Courthouse
353-6975

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1682

[Received Sep. 18, 1969, Elbert A. Wagner, Jr. Clerk, United States District Court]

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION ET AL., DEFENDANTS

STIPULATED TESTIMONY

John Sant, Attorney, McDonnell Douglas Corporation, St. Louis, Missouri, if called in this case to testify, will testify as follows:

(a) The St. Louis, Missouri based facility of McDonnell Douglas Corporation converted its power and heating system from coal to gas in 1967.

(b) The principal reason for this conversion was the adoption of state and local air pollution regulations which, among other provisions, required coal consumers in the city of St. Louis to use only low sulphur coal (less than 1.0%) and also required extensive filtration to reduce particulate emission.

(c) McDonnell Douglas Corporation concluded that gas was economically preferable to coal due to the high cost of low sulphur coal and the additional expense involved in installing and maintaining filtering equipment for particulate removal.

(d) During the time that coal was burned at the St. Louis facility, a gas heating and power system was maintained and always was available for emergency use.

(e) In the years ending June 30, 1966 and June 30, 1967, the St. Louis facility consumed 19,000 and 11,000 tons of coal, respectively.

(f) All of the consumed coal at the St. Louis facility from July 1, 1965 to June 30, 1967 was purchased from coal producers located in Franklin County, Illinois.

Dated: September 17, 1969

/s/ Donald G. Kempf
KIRKLAND, ELLIS, HODSON,
CHAFFETZ & MASTERS
Prudential Plaza
Chicago, Illinois 60601

Attorney for defendants

/s/ John T. Cusack
JOHN T. CUSACK

Attorney, Department of Justice

Room 2634 U.S. Courthouse
353-6975

EXCERPTS FROM TRANSCRIPT OF PROCEEDINGS BEFORE HON. EDWIN A. ROBSON, UNITED STATES DISTRICT JUDGE FOR THE NORTHERN DISTRICT OF ILLINOIS, EASTERN DIVISION, ON OCTOBER 3, 1969

* * * *

[10] THE COURT: All right. Go ahead, Mr. Sarbaugh.

MR. SARBAUGH: What we are after, as much as the designation of assets, is who is going to buy it and what is he going to do with it, and until we see what someone who is expert in the coal industry tells us what he will do with whatever the assets are, whether they be merely Industry and Round Prairie or more, we cannot make that kind of decision because we have a responsibility not to consent to something that is not going to restore competition. That is the purpose of the case.

Now, as to the Zeigler matter, I do want to say that I have some sympathy with the defendants on the Zeigler matter. It was a borderline company in terms of one that we approved, and I approved it, but I knew when we did it that it was a borderline company, but you have to find acceptable purchasers in these divestiture cases, and we have had some very bad luck in finding them.

Here is a company that has only three [11] million in production a year, with General Dynamics having thirteen million and with Peabody having twenty-three million, and it is a little company, it has no General Dynamics or Kennecott behind it, it has lost money, it is interested in staying in the coal business, so as a possible better alternative than the one of having either General Dynamics or Kennecott owning one of these matters, we thought a company that ranked seventh in Illinois and ninth or tenth in the Eastern Interior Coal Province was better than the status quo.

Now, as to reserves, I am aware that Zeigler has a few hundred million tons of claimed reserves. I am also aware that they have been able to pick these up in 1966 to 1968 at the same time that United Electric was not able to pick up reserves.

MR. CHAFFETZ: Underground?

MR. HEDLUND: All deep reserves.

MR. SARBAUGH: It is all deep reserves. When I referred to three million in connection with Zeigler, I was referring to three million tons of production in Illinois.

MR. HEDLUND: Your Honor, I would like to reply, if I may, to what Mr. Sarbaugh has just brought up, and [12] I think this might be helpful.

THE COURT: Go right ahead.

MR. HEDLUND: Zeigler has a total production of 3,900,000 tons, of which about 3,000,000 tons is in Illinois, as Mr. Sarbaugh says.

The combination of Zeigler and Midland would have 10,000,000 tons in comparison to UEC-Freeman's 1967 production of 13,000,000 tons.

However, in Zeigler's case, they have closed two mines in the past three years, not because these mines ran out of coal, but because of operating problems or because of a non-profit situation.

The point here is that this 10,000,000 ton production is an elusive thing. It could easily go up to 14,000,000 or 15,000,000. Their resource base is substantially larger than that of Freeman-UEC. Zeigler-Midland is 678,000,000 tons of coal and UEC-Freeman is 605,000,000 tons. That includes the Industry and Round Prairie Field that we included in our offer.

Midland is a strip only, United Electric is a strip only. Zeigler is a deep only, Freeman is a deep only. It is a natural partnership.

We can well understand how you could approve [13] that, because I do not think a Midland-Zeigler combination affects competition for the very same reasons that a United Electric-Freeman merger does not affect competition. The comparison is startling, and it was with that in mind that we had concern about our initial offer.

We fail to see, really, how you can maintain one position in one case, and in a simultaneous proceeding do exactly the opposite.

Now, the essential thing is that Midland-Zeigler, when combined, would be the second largest coal producer in Illinois and the second largest coal producer in the Midwest. That is what Freeman-UEC presently is. So what

is your objective? You do not like this second largest producer, so you are going to replace it with something else?

Now, in addition, about Zeigler being a marginal company, Zeigler has made money every year for the past eleven years. Quoting from their last annual report, it says in part, "We can only say that the whole organization is determined to make 1969 a banner year."

Their last six month report says, or rather, for the first six months of 1969, "Other income amounted [14] to $171,000 compared to"—no, that is not it. I meant to refer to the last paragraph, which says:

> "Operating results of the Zeigler No. 4 mine improved appreciably during the second quarter. Indications are the improved operating conditions at this mine, as well as at all other properties, will continue in the months ahead and satisfactory earnings for the balance of 1969 are anticipated."

I think the Court can understand the questions that our client can ask, namely, "They are trying to dismantle us at a very belated point in time, and at the same time they are approving another combination that would be the same."

* * * *

MR. EISEN: You can see why your offer to us was really not an offer at all, because you say, and we are inclined to agree with you, that as of today they are not commercially valuable, so this is what you are offering to sell.

* * * *

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION ET AL., DEFENDANTS

MOTION OF FRANK F. KOLBE TO BE EXCUSED FROM TESTIMONY AT TRIAL

FRANK F. KOLBE, by his attorney, JOHN PAUL STEVENS, moves the Court for the entry of an order excusing him from testifying at the trial of the above cause. In support of said motion, KOLBE says:

1. In October 1968, KOLBE appeared voluntarily to testify in deposition proceedings in this cause. Because of his age and the then condition of his health, it was agreed between the parties that the deposition testimony would be limited to half-day sessions; that he testified during approximately four half-day sessions in response to questions propounded by the Government and that he testified during eight or nine half-day sessions in response to questions propounded by the defendants. The deposition transcript is approximately 1,000 pages long.

2. Subsequent to October, 1968, the condition of KOLBE's health has substantially deteriorated and he has been advised by his physician, Dr. Richard B. Capps, that his health might be further impaired to a serious extent if he were required to testify as a witness in open court for extended periods of time.

3. To the best of his recollection, he has no knowledge of any material facts relating to the above litigation which were not discussed fully during the course of his deposition, and he in good faith believes that additional testimony by him would be of no material benefit to the Court.

4. Shortly after the conclusion of his deposition he read over the transcript of his testimony and, except for the corrections which were forwarded to counsel for the Government, he is satisfied that the testimony then given was in accord with his best recollection.

5. In view of his age and infirmity, as set forth in the letter of Richard B. Capps, M.D., addressed to John Paul Stevens under date of March 2, 1970, which is attached hereto as Exhibit A, and in view of the fact that he has already testified at great length for the convenience of both parties, KOLBE respectfully submits that exceptional circumstances exist which make it desirable and appropriate, in the interest of justice, to permit him to be excused from giving further testimony in the cause.

6. Unless either party can make a compelling showing as to the necessity of his personal attendance at the trial, no valid reason exists for further imposing on a third party witness subject to the infirmities set forth in Exhibit A.

WHEREFORE, KOLBE respectfully prays that an appropriate order be entered by the Court excusing him from further testifying in this case.

/s/ John Paul Stevens
JOHN PAUL STEVENS
Attorney for
Frank F. Kolbe

ROTHSCHILD, STEVENS, BARRY & MYERS
105 South La Salle Street
Chicago, Illinois 60603
FR. 2-2345

Received a copy of the foregoing Notice and Motion of Frank F. Kolbe referred to therein before 4:00 o'clock P.M. this 3rd day of March, 1970.

JOHN THOMAS CUSACK
Attorney for Plaintiff

Received a copy of the foregoing Notice and Motion of Frank F. Kolbe referred to therein before 4:00 o'clock P.M. this 3rd day of March, 1970.

REUBEN L. HEDLUND
DONALD G. KEMPF
Attorneys for Defendants

By _____

EXHIBIT A.

Richard B. Capps, M.D.
Philip N. Jones, M.D.
Andrew Thomson, M.D.
Howard J. Rosenblate, M.D.
1725 West Harrison
Chicago, Illinois 60612
738-2966

March 2, 1970

Mr. John Paul Stevens
105 South LaSalle—Room 603
Chicago, Illinois

Dear Mr. Stevens:

At your request I am writing you in regard to Mr. Frank F. Kolbe who may be asked to testify as a witness in a case to be tried in the Federal Court. I am a practicing physician in the city of Chicago who is certified as a specialist in internal medicine and also the subspecialty of cardiovascular disease. Mr. Kolbe has been a patient of mine since 1954. He enjoyed reasonably good health considering his age until December of 1967 when he developed diabetes and bouts of auricular fibrillation, an irregularity of the heart beat. In the fall of 1968 he began to fail and in November of that year was found to have a cancer of the colon. This was operated and removed on the 23rd of November 1968.

In early February of 1969 he developed acute serum hepatitis as a result of transfusions received at surgery. This necessitated a chair and bed existence for a number of months followed by marked restriction of physical activity. The hepatitis persisted until October of 1969. In the meantime his auricular fibrillation is now present most of the time so that he has had to be digitalized and requires diuretics because of low grade congestive heart failure. During the last four or five months he has made considerable improvement but still tires very easily and requires much extra rest. He is now up and around and has even been able to attend a few short meetings and make a few short trips.

In view of the fact that Mr. Kolbe would have to be on the witness stand for a number of days if he did serve as a witness in this trial, I would strongly recommend that he be excused from serving because of medical reasons. I believe it is clear that it would put a great strain on him which would be highly undesirable.

Sincerely yours,

/s/ R. B. Capps
RICHARD B. CAPPS, M.D.

RBC:s

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

[Filed Oct. 27, 1970]

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION ET AL., DEFENDANTS

DEFENDANTS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
RICHARD H. IRVING, III
Attorneys for Defendants

Kirkland, Ellis, Hodson,
Chaffetz & Masters
2900 Prudential Plaza
Chicago, Illinois 60601

TABLE OF CONTENTS

	Finding	Page
I. JURISDICTION	1	1
II. NATURE OF THE EVIDENCE	9	3
Officers, Directors & Employees of Defendants	10	3
Executives of Other Coal Producers	19	6
Consumer Executives	23	7
Nuclear, Gas & Oil Officials	28	10
Executives From Amalgamated Industries	30	10
Government Officials & Other Executives	31	11
Air Pollution Witnesses	32	11
Other Witnesses	34	12
Statistical Foundation	36	12
Expert Witnesses & Reports	37	13
Documentary Evidence	44	18
Data Supplied in Response to Questionnaire	46	19
III. BACKGROUND OF THE DEFENDANTS	49	20
A. GENERAL DYNAMICS CORPORATION	49	20
B. FREEMAN COAL MINING CORPORATION	54	21
C. THE UNITED ELECTRIC COAL COMPANIES	67	25
History & Mines	67	25
UEC's Coal Reserves	79	28
UEC's Critical Reserve Position	84	31
UEC's Lack of Deep Mining Experience	100	37
Prior UEC Merger & Acquisition Attempts	116	44
IV. BACKGROUND OF THE ACQUISITION	124	47
V. BACKGROUND ON THE COAL INDUSTRY	138	53

	Finding	Page
Changes in the Demand for Coal	139	53
Emergence of Utility Demand as the Principal Market for Coal	146	55
Changes in the Production of Coal	152	58
Changes in the Structure of the Coal Industry	159	60
VI. BACKGROUND AND DESCRIPTION OF THE UTILITY INDUSTRY, THE PRINCIPAL MARKET FOR COAL	167	64
How Utilities Purchase Coal	170	65
Decline of the Spot Market for Coal	180	69
Competition for Utility Contracts	182	70
Bargaining Power of Utilities	188	73
VII. INTERFUEL COMPETITION	192	75
A. COAL IS FACED WITH INTENSE COMPETITION FROM OTHER FUELS	192	75
Competition from Gas & Oil	202	78
Industrial Consumers	205	79
Utility Consumers	211	81
Competition from Nuclear Energy	221	84
Other Alternate Power Sources	237	90
Multi-Energy Companies	242	92
B. AIR POLLUTION RESTRICTIONS WILL INTENSIFY THE COMPETITION COAL FACES FROM OTHER FUELS	246	94
Enactment of Air Pollution Laws	246	94
Abatement Techniques & Their Effect on Coal	254	96
Precipitators	255	97
Sulphur Oxide Control Devices	259	98
The expense and Experimental Nature of Air Pollution Control Devices Will Adversely Affect Coal Consumption	271	104
C. SUMMARY	281	109
VIII. MIDWEST COAL DISTRIBUTION PATTERNS	283	111
A. TRANSPORTATION FACTORS DETERMINE WHERE COAL MINES CAN COMPETE	283	111

	Finding	Page
Freight Rate Districts	286	112
B. COAL QUALITY CHARACTERISTICS ARE ALSO A DETERMINING FACTOR	289	113
C. COMMONWEALTH EDISON COMPANY IS A UNIQUE COAL PURCHASER	297	116
D. METROPOLITAN CHICAGO INTERSTATE AIR QUALITY CONTROL REGION IS ALSO A UNIQUE COAL MARKET	303	118
E. THE FREIGHT RATE DISTRICTS IN WHICH THE MINES OF UEC AND FREEMAN ARE LOCATED HAVE DISTINCT DISTRIBUTION PATTERNS	309	120
Fulton-Peoria Freight Rate District	314	122
Springfield Freight Rate District	321	124
Belleville Freight Rate District	328	125
Southern Illinois Freight Rate District	335	128
F. SUMMARY	342	130
IX. FREEMAN AND UEC HAVE LONG BEEN PREDOMINANTLY COMPLEMENTARY RATHER THAN COMPETITIVE PRODUCERS	346	133
X. THE GOVERNMENT'S CASE IS BASED UPON MISCONCEPTIONS OF THE REALITIES OF THE COAL INDUSTRY	361	140
A. INTERFUEL COMPETITION CANNOT BE IGNORED	361	140
B. DISTRIBUTION PATTERNS OF COAL ARE NOT DETERMINED BY ARTIFICIAL CONSIDERATIONS	364	141
C. THE GOVERNMENT'S STATISTICS ARE MISLEADING	374	145
Production Figures are an Inadequate and Inaccurate Measure of Market Strength	374	145
The Inadequacy of Production Figures as a Measure of Market Strength is Compounded by Grouping Them in Unrealistic Markets	378	147

	Finding	Page
The Government's Statistics Show No Real Concentration Trend	381	148
XI. THE EFFECT OF THE COMMON OWNERSHIP OF UNITED ELECTRIC AND FREEMAN HAS NOT BEEN, AND WILL NOT BE, SUBSTANTIALLY TO LESSEN COMPETITION IN ANY LINE OF COMMERCE IN ANY SECTION OF THE COUNTRY	386	151
A. UEC DOES NOT HAVE THE UNCOMMITTED RESERVES WHICH A COAL COMPANY REQUIRES IN ORDER TO COMPETE	386	151
B. UEC'S STRIP RESERVES AT THE INDUSTRY FIELD AND OTHER SCATTERED MIDWEST STRIP RESERVE HOLDINGS HAVE NO COMPETITIVE PROMISE	391	153
The Industry Field	391	153
Other Miscellaneous Midwest Strip Reserves	397	155
C. COMMERCIALLY RECOVERABLE STRIP RESERVES IN THE MIDWEST ARE NOT AVAILABLE FOR ACQUISITION	398	156
D. STANDING ALONE, UEC WOULD BE UNABLE SUCCESSFULLY TO UNDERTAKE DEEP MINING	412	161
UEC's Strip Mining Experience Would Be of No Benefit	413	161
An Independent UEC Would Not Likely Attempt Deep Mining	421	164
UEC's Deep Reserves Are Not Presently Mineable	428	167
E. KNOWLEDGEABLE INDUSTRY WITNESSES CONFIRMED THAT THE UEC-FREEMAN AFFILIATION POSES NO THREAT TO COMPETITION	431	169
The Evidence From Other Coal Producers	434	170
The Evidence From Coal Consumers	437	171

	Finding	Page
F. THE UEC-FREEMAN AFFILIATION HAS LED TO SIGNIFICANT COMPETITIVE BENEFITS	442	174
G. THE IMPLICATIONS INHERENT IN THE GOVERNMENT'S APPROVAL—"WITHOUT RESERVATION"—OF A PROPOSED ZEIGLER-MIDLAND COMBINATION	449	177
H. SUMMARY	457	181

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION ET AL., DEFENDANTS

FINDINGS OF FACT

I. JURISDICTION *

1. Defendant General Dynamics Corporation ("General Dynamics" or "GD") is a corporation organized and existing under the laws of the State of Delaware, with its headquarters located in New York, New York. *Admitted by plaintiff, DPTF* 1.

2. Defendant The United Electric Coal Companies ("United Electric," "United" or "UEC") is a corporation organized and existing under the laws of the State of Delaware, with its headquarters located in Chicago, Illinois. *Admitted by plaintiff, DPTF* 2.

3. Defendant Freeman Coal Mining Corporation ("Freeman") is a corporation organized and existing under the laws of the State of Illinois, with its headquarters located in Chicago, Illinois. *Admitted by plaintiff, DPTF* 3.

4. Defendants Freeman and UEC are wholly owned subsidiaries of defendant General Dynamics. *Admitted by plaintiff, DPTF* 4.

---

* The following abbreviations are used: DPTF for Defendants' Pre-Trial Findings; GPTF for Government Pre-Trial Findings; GF for Government's Proposed Findings; DX and GX to denote exhibits; Dep. and Tr. to denote deposition and trial transcript references.

5. Defendants General Dynamics, Freeman and UEC are engaged in commerce within the meaning of Section 7 of the Clayton Act, 15 U.S.C. § 18. *Admitted by plaintiff, DPTF* 5.

6. This action is filed under Section 15 of the Act of Congress of October 15, 1914 (15 U.S.C. § 25), as amended, commonly known as the Clayton Act, in order to prevent and restrain the alleged violation by the defendants of Section 7 of the Clayton Act (15 U.S.C. § 18). *Admitted by plaintiff, DPTF* 6.

7. Each of the defendants is found and transacts business within the Northern District of Illinois, Eastern Division. *Admitted by plaintiff, DPTF* 7.

8. This Court has jurisdiction of the subject matter of this action and of the parties thereto. *Admitted by plaintiff, DPTF* 8.

II. NATURE OF THE EVIDENCE

9. As is detailed in the findings below, the record in this case consists of more than 7,500 pages of trial transcript and deposition testimony,* and more than 800 trial and deposition exhibits, containing in excess of 10,000 pages.

Officers, Directors and Employees of Defendants

10. Frank Nugent, Group Vice-President of General Dynamics and President of both Freeman and UEC, was deposed by the Government and testified for defendants at trial. Mr. Nugent joined Freeman in the early 1920's and, with the exception of the period between January 1, 1968 and April 1, 1969, has been the company's president since the mid 1950's. Mr. Nugent also became chairman of UEC's Executive Committee in 1959, and, again with the exception of the period between January 1, 1968 and April 1, 1969, has served as president of UEC since 1966. *Nugent Dep.* 3, 44; *Nugent Tr.* 1830.

---

* All depositions, whether taken by plaintiff or defendants, have been received in evidence. *Tr.* 144-44A, 2272.

11. John M. Morris, presently serving UEC in a consulting capacity, was deposed by the Government and testified for defendants at trial. Mr. Morris joined UEC's sales staff in the 1920's. He became Sales Vice-President and a Director in 1954. Mr. Morris was made President of UEC in 1959 and served in that capacity until his retirement in 1966. *Morris Dep.* 5-7; *Morris Tr.* 152, 153.

12. Two former outside directors of UEC testified for defendants at trial. John D. Ames, a partner in the investment banking firm of Bacon, Whipple & Company, was placed on UEC's board in 1948 by Frank Kolbe, UEC's president, and remained a director until 1966 when UEC became a wholly owned subsidiary of General Dynamics. Reuben Thorsen, a limited partner and former chairman of the investment banking firm of Paine, Webber, Jackson & Curtis, was elected to UEC's board in 1959. At that time, one of his firm's clients, Incorporated Investors, a large Boston-based investment trust, held approximately 10 percent of UEC's stock. *Ames Tr.* 1693-94; *Kolbe Dep.* 32; *Thorsen Tr.* 582-84.

13. Thomas J. Tarzy, UEC's Vice President of Western Operations, was deposed by the Government. Mr. Tarzy joined UEC in 1952 as sales manager, and served as the company's Sales Vice President from 1959 until he assumed his present position in December of 1966. He also served as a director from 1964 through 1966. *Tarzy Dep.* 3, 8-9, 23.

14. Robert H. Inman, Vice President of Operations, Resources Group, General Dynamics, became a field engineer for UEC in 1948 and was the company's Vice President of Operations from December 1965 until April of 1968, when he left UEC to undertake his present responsibilities. Mr. Inman's deposition was taken by the Government. *Inman Dep.* 5, 8, 11-12.

15. Depositions were taken by the Government of two of General Dynamics corporate officers, John P. Maguire, Secretary, and Harold K. Pedersen, Treasurer. *Maguire Dep.* 3; *Pedersen Dep.* 3.

16. Thomas A. Latimer, UEC's Manager of Lands, has been engaged in securing coal lands for UEC since 1939. He was deposed by the Government and was called by

defendants at trial in order to establish a foundation for DX 60D. This is a chart entitled "United Electric Coal Companies, Possible Reserve Acquisitions at Existing Mines," the admissibility of which the Government agreed to upon the completion of its cross-examination of Mr. Latimer. *Latimer Dep.* 5-10; *Latimer Tr.* 1341-43.

17. Burl C. Jensen is a geologist employed by UEC since 1963. He was deposed by the Government. *Jensen Dep.* 5-6.

18. Frank F. Kolbe served as UEC's President and chief executive officer from 1939 until the fall of 1959. At that time, John Morris became President of UEC and the Board created the post of Chairman for Mr. Kolbe. UEC's Board of Directors was also realigned and Frank Nugent —President of Freeman—became chairman of UEC's Executive Committee. Within a few years Mr. Kolbe sold his UEC stock and resigned as Chairman and Director. Mr. Kolbe remained in reasonably good health until the fall of 1967. In the fall of 1968, he began to fail, and, shortly before he was operated on for cancer, his deposition was taken by the Government. While there had been considerable improvement in Mr. Kolbe's health in the months before trial, and the Government had indicated its intention to call him at trial, Mr. Kolbe's physician recommended that he not testify. Pursuant to agreements reached between the parties, Mr. Kolbe's request to be excused was granted by the Court. *Kolbe Dep.* 9-10; *GX* 200, *pp.* 4003-08; *Motion of Frank F. Kolbe To Be Excused From Testifying At Trial, with attached Letter; Defendants' Reply To Motion of Frank F. Kolbe To Be Excused From Testifying At Trial.*

Executives of Other Coal Producers

19. Testimony was taken from executives of seven other coal producers. Nicholas T. Camicia, President of The Pittston Company, one of the country's largest coal companies—with an annual production of 23 to 24 million tons, principally from deep mines—was called by defendants at trial to testify with respect to UEC's prospects for entry into deep mining. Before becoming president of Pittston in April of 1969, Mr. Camicia served as

president of both UEC and Freeman, during which time his deposition was taken by the Government. *Camicia Tr.* 1382-85.

20. Two other coal executives appeared at trial. Hollie Hopper, Vice President of Operations of the Ayrshire Coal Company Division of American Metal Climax, Inc., was called as a rebuttal witness by the government, and Samuel F. Sherwood, President of Calvert-Youngblood Coal Company, and President of Stonefort Coal Mining Company at the time it was acquired by Peabody Coal Company, testified on behalf of defendants. *Hopper Tr.* 1864-65; *Sherwood Tr.* 1448-49.

21. Before trial, defendants took the depositions of the chief executives of three smaller coal producers, Clarence V. Beck, President of Little Dog Coal Company; William D. Stiehl, President of Belle Valley Coal Company; and Leon King, President of Barbara Kay Coal Company. *Beck Dep.* 2; *Stiehl Dep.* 3; *King Dep.* 4.

22. By agreement of the parties, a stipulation was entered concerning the testimony of George H. Shipley, President of Carter Oil Company, a wholly owned subsidiary of Humble Oil and Refining Company, the principal domestic operating subsidiary of Standard Oil Company (New Jersey). The stipulation details Humble's coal reserve exploration and acquisition activities and its plans for the opening of a deep coal mine near Carlinville, Illinois. *Shipley Stip.* 1-5.

Consumer Executives

23. Testimony was taken by defendants from a representative cross-section of midwest energy consumers. These executives were from large, medium-sized and small utilities, a rural electric cooperative, federal electric authority, retail coal dealer, and industrial concerns, and came from every midwest state which the Government alleges to be of significance in this case. The utility executives represented companies which, taken together, consume more than 60 percent of all coal sold to utilities in the midwest. *DX* 85, *Table XXX.*

24. These consumer witnesses were responsible high-level executives with extensive experience in the pur-

chasing of their companies' energy requirements, and were able to give testimony concerning virtually every issue in the case.

25. At trial, defendants called Gordon R. Corey, Chairman, Finance Committee, *Commonwealth Edison Company*, Chicago, Illinois; E. C. Hill, Former Chief of Coal Procurement, *Tennessee Valley Authority*, Chattanooga, Tennessee; Victor H. Wood, Superintendent of Fuel Procurement, *Northern States Power Company*, Minneapolis, Minnesota; A. H. Davis, President, *Central Illinois Light Company, Peoria*, Illinois; Norman Moser, Chief Engineer, *Dairyland Power Cooperative*, LaCrosse, Wisconsin; Robert W. Steele, President, *Interstate Power Company*, Dubuque, Iowa; and Louis R. Tomey, Superintendent of Supply Service, *Union Electric Company*, St. Louis, Missouri. *Corey Tr.* 1580; *Hill Tr.* 1071; *Wood Tr.* 598; *Davis Tr.* 686; *Moser Tr.* 1508; *Steele Tr.* 930; *Tomey Tr.* 321.

26. Prior to trial, defendants deposed Bernard W. Schotters, President, *Indianapolis Power and Light Company*, Indianapolis, Indiana; Gordon J. Morrison, Superintendent of Steam Plants, *Wisconsin Public Service Company*, Green Bay, Wisconsin; LeRoy M. Abrahamson, Manager of Power Production, *Wisconsin Power and Light Company*, Madison, Wisconsin; Fred E. Nicosin, Vice-President of Power, *Public Service Company of Indiana*, Plainfield, Indiana; Thomas M. Ward, Vice-President, Secretary and Treasurer, *Ohio Valley Electric Corporation*, and its subsidiary *Indiana-Kentucky Electric Corporation*, Columbus, Ohio; Harry B. Gaunt, Purchasing Director, *Kentucky Utilities Company;* Reuben A. Redard, Vice-President, Purchases, *Keystone Steel and Wire Company*, Peoria, Illinois; and Hugh E. Petersen, President, *J. W. Petersen Coal and Oil Company*, Retail *Coal Dealer*, Chicago, Illinois. *Schotters Dep.* 4; *Morrison Dep.* 4; *Abrahamson Dep.* 4-5; *Nicosin Dep.* 6-8; *Ward Dep.* 4; *Gaunt Dep* 3; *Redard Dep* 5; *Petersen Dep.* 4.

27. Stipulations were entered with respect to the testimony of four consumer witnesses, George B. Knecht, Purchasing Agent, *Standard Lime and Refractories Com-*

pany, Baltimore, Maryland; J. R. Sinclair, Assistant to the General Counsel, *Dow Chemical Company*, Midland Michigan; John Sant, Attorney, *McDonnell-Douglas Corporation*, St. Louis, Missouri; and David G. Hemminger, Attorney, *Proctor and Gamble Company*, Cincinnati, Ohio. *Knecht Stip.* 6; *Sinclair Stip.* 1; *Sant Stip.* 1; *Hemminger Stip.* 1.

Nuclear, Gas and Oil Officials

28. At trial, Ernest B. Tremmel, Director of Industrial Participation of the *United States Atomic Energy Commission*, and George Gamble, an independent consultant working primarily with *Gulf General Atomic Company*, testified for defendants with respect to past, present and future developments in the use of nuclear energy for the generation of electricity. Mr. Gamble is a director of Union Electric Company in St. Louis, and was formerly the company's executive vice-president. He also testified with respect to certain other issues in the case. *Tremmel Tr.* 770-74; *Gamble Tr.* 1232-35.

29. Before trial, defendants deposed Harold S. Walker, Director of Public Affairs of the *American Gas Association*, and Winford C. Peterson, President of the *National Oil Fuel Institute*, with respect to the past, present, and likely future use of gas and oil as alternative fuels to coal. *Walker Dep.* 3; *Peterson Dep.* 3.

Executives From Amalgamated Industries

30. Two executives from Amalgamated Industries,* B. H. Sloane, Vice President, and Philip W. Dorrance, Division General Manager, were deposed by defendants with respect to the reserve acquisition efforts undertaken by UEC on behalf of Amalgamated. *Sloane Dep.* 4; *Dorrance Dep.* 3.

Government Officials and Other Executives

31. Jack A. Simon, Principal Geologist, *Illinois State Geological Survey* ("IGS"), testified at trial for both parties concerning Illinois strip coal reserves. Among

* In order to protect trade secrets, this pseudonym is used throughout.

other functions, the IGS compiles estimates on the quantity of coal to be found in the ground in Illinois. Mr. Simon was deposed in advance of trial by the Government. *Simon Dep.* 3-4.

Air Pollution Witnesses

32. William J. Stanley, Director of Air Pollution Control, *City of Chicago;* John S. Moore, Engineer, Bureau of Air Pollution, *State of Illinois;* and John T. Middleton, Commissioner, National Air Pollution Control Administration, *United States Department of Health Education and Welfare,* were deposed by defendants with respect to the air pollution regulations being formulated and enacted at the local, state, and national level and enforcement activities designed to assure compliance therewith. *Stanley Dep.* 3; *Moor Dep.* 3; *Middleton Dep* 2.

33. Thomas L. Craig, Manager of Pollution Control, *Wellman-Lord Company;* Robert H. Quig, Engineer, Utility Operations, *Chemical Construction Corporation;* and Daric N. Miller, Manager of Electrical Production, *Kansas Power and Light Company,* were called at trial as rebuttal witnesses by the Government to testify concerning equipment for controlling sulphur oxides emitted during the burning of coal. *Craig Tr.* 2035; *Quig Tr.* 2173-74; *Miller Tr.* 1723.

Other Witnesses

34. Richard Drollinger, Director of Engineering of *Harnischfeger Corporation,* testified at trial for defendants with respect to strip mining technology and equipment. *Drollinger* Tr. 1151-57.

35. Defendants deposed three *Government Services Administration* employees who work in the United States Courthouse and Federal Building in which this suit was tried. Aldo P. Brazzale, Supervising Mechanical Engineer, testified with respect to the impact of air pollution regulations on fuel consumption and the decision to convert the boilers in the Courthouse from coal to a combination of gas and oil. John P. Nix, Building Management Officer, and Josephine C. Burton, Fuel Procurement Agent, testified with respect to the Government's practice of purchasing only coals whose characteristics meet specifications set by the Government in light of the design re-

quirements of its boilers. *Brazzale Dep.* 4; *Nix Dep.* 5; *Burton Dep.* 4.

Statistical Foundation

36. In order to lay a foundation for admission into evidence of certain statistical information, the Government deposed Joseph C. Tabor, Chief Clerk, Illinois Department of Mines and Minerals; Joseph J. Gallagher, Supervising Industry Economist, Bureau of Mines, United States Department of the Interior; Charles W. Stadell, Executive Vice-President, Midwest Coal Producers Institute, Inc.; Martha Terleke, Corporate Secretary and Assistant Treasurer, Midwest Coal Producers Institute, Inc.; William Kurtz, Manager, Division of Economic Coal Statistics, National Coal Association. In addition, the testimony of C. C. Smith, Business Manager, Kentucky Department of Mines and Minerals, was stipulated to by the parties. *Tabor Dep.* 3; *Gallagher Dep.* 3; *Stadell Dep.* 4-5; *Terleke Dep.* 4-5; *and Kurtz Dep.* 3-5; *Smith Stip.* 1.

Expert Witnesses and Reports

37. *John E. Organ* is a geologist whose principal occupation since 1932 has been the exploration or acquisition for others of coal lands and mining rights. He holds a Master's Degree in Geology from George Washington University. He has been responsible for the development of numerous midwest strip coal fields and has made on-side investigations in virtually every coal producing county in Illinois, Indiana and West Kentucky. Mr. Organ prepared a Report (*DX* 88) concerning the availability of economically mineable strip reserves in the midwest. Mr. Organ's qualifications and Report were cross-examined through deposition by the Government in advance of trial. *Organ Dep.* 3-4;

38. *Paul Weir Company* has served for thirty-one years as mining engineers and geology consultants for the Federal Government, coal producers, railroads, electric utilities, mineral ore firms and financial institutions. They were acknowledged by one of the Government's own witnesses to be one of the most widely known and highly regarded mining engineering companies in the world.

A Report (*DX* 87) was prepared by Paul Weir Company on the availability of economically mineable strip reserves in the midwest. The Report discusses in detail the strip mining potential of UEC's Industry Field and other fields investigated by UEC in the past and contended by the Government to be economically mineable. Finally, the Report analyzes UEC's ability as an independent operating company to engage in deep mining. Prior to trial, John P. Weir, Executive Vice President of Paul Weir Company, was deposed by the Government, and cross-examined with respect to the above mentioned Report. *Weir Dep.* 3; *Weir Dep. Ex.* 19; *Hopper Tr.* 1894.

39. *S. Smith Griswold*, President of Seversky Environmental Dynamics Research Associates (SEDRA) prepared a Report entitled "Impact of Sulphur Oxide Regulations On Midwest Coal Markets" (*DX* 89). The Report discusses the regulatory patterns of air pollution control in midwestern states and cities, their impact upon coal consumption, and the developmental status of emission control technology.

Mr. Griswold was one of the nation's first air pollution control officials. From 1954 through 1965, he was the Chief Air Pollution Control Officer for Los Angeles County. During that time, his department established the first air monitoring system and conducted basic research on the cause and abatement of air pollution. Significantly, his Department operated on a budget in the 1950's that was greater than that being spent by all other pollution control offices in the country combined, including that of the Federal Government.

Mr. Griswold served as Assistant Director of the National Air Pollution Control Administration (NAPCA) from the time of the inception of the federal air pollution control program in 1965 until 1968, when Mr. Griswold and a number of NAPCA staff members left Government service to form SEDRA. He was responsible for all matters of enforcement while with NAPCA, and also supervised the original study of sulphur oxide levels conducted by the Federal Government.

Since that time, this firm has done research in the field of air pollution for federal, state and local agencies,

for electric utilities and for industrial firms. Mr. Griswold has frequently consulted with the Antitrust Division of the U.S. Department of Justice as a prospective witness in pending litigation—even after his retention by the defendants here.

At one time or another, Mr. Griswold has contacted and studied every air pollution control agency in the United States and has consulted on every item of federal air pollution legislation from the first congressional enactment on the subject to the present. He holds a Master's Degree in Government Administration from Stanford University.

Prior to trial, the Government deposed Mr. Griswold and cross-examined him concerning the above described Report. *Griswold Dep.* 3-11, 13-14, 21-22, 35-36, 211-13, 261.

40. *Dr. Bruce C. Netschert*, Director of the Washington Office, National Economic Research Associates, prepared a Report and accompanying statistical analysis entitled "Interfuel Competition and Changes in the Coal Industry Since World War II" (*DX* 85). Dr. Netschert holds a Bachelor's Degree in Geology and a Ph.D. Degree in Economics from Cornell University. He has served on Presidential Commissions relating to national policy for energy and mineral resources, and through his work with the Bureau of Mines, The Office of Defense Mobilization and the Central Intelligence Agency, Dr. Netschert has directed various programs concerned with the availability and use of energy.

Since 1961, as NERA Director, Dr. Netschert has undertaken extensive research on the national, regional and local supply and demand of energy resources. He has served as consultant for the Federal Power Commission and has testified before a variety of Congressional committees. Dr. Netschert is the author of five books and numerous articles on subjects relating to energy and power.

Dr. Netschert was deposed by the Government prior to trial and cross-examined about his Report and statistical analysis. *Netschert Dep.* 3-6, 7-8; *DX* 85 *and appended "Vita and Bibliography"*.

41. *Abraham Gerber*, Senior Consultant with National Economic Research Associates, prepared a Report entitled "Structure and Geography of the Electric Utility Market for Coal" (*DX* 86). Mr. Gerber has served as special assistant to President Philip Sporn of American Electric Power, the nation's largest investor-owned utility system and one of its largest coal consumers. In this capacity, he participated in fuel procurement and combustion decisions, and directed research on the development of nuclear energy and other fuel resources.

Mr. Gerber has held positions in the Presidential Cabinet Committee on Energy, the Subcommittee on Energy and Raw Materials Resources and the Office of Coal Research of the Department of the Interior. Gerber also served as technical advisor to both the FPC National Power Survey and the Interdepartmental Energy Study of the Federal Government.

Mr. Gerber has taught graduate seminars on nuclear power at M.I.T., and authored numerous articles dealing with electric utilities, boiler design, coal characteristics and the impact of air pollution upon energy economics.

Mr. Gerber was deposed by the Government prior to trial and Cross-examined on his Report. *Gerber Dep.* 3-6, 9; *DX* 86 *and resume attached thereto.*

42. Two expert economists gave testimony at trial. *Dr. Peter O. Steiner* was called by defendants. Dr. Steiner holds a joint appointment to the University of Michigan School of Law and the College of Literature, Science and the Arts, and teaches courses in economic theory, statistics and antitrust economics. He received his Bachelor's Degree from Oberlin College and both his Master's and Doctorate in Economics from Harvard University. He has done research for the U.S. Bureau of the Budget and for the Treasury Department. He also served on President Nixon's Task Force on Productivity and Competition. Dr. Steiner has written numerous articles, book reviews and book chapters. He is co-author of *Economics*, a basic economic textbook that is being used by over 140 colleges and universities.

Dr. Steiner spent over a year familiarizing himself with the record and documents and analyzing the data

in this case. In addition to his testimony at trial, Dr. Steiner's deposition was taken by the Government prior to trial. An expert Report (*Steiner Dep. Ex.* 2) prepared by Dr. Steiner, and cross-examined by the Government during his deposition, is in evidence. *Steiner Tr.* 2098-2101; *Steiner Dep.* 8-11, 20-24; *Steiner Dep. Exs.* 1, 2.

Mr. James Folsom, a staff economist at the Federal Trade Commission, appeared as a rebuttal witness on behalf of Plaintiff. Mr. Folsom received his Bachelor's Degree from the University of Georgia, and attended graduate school there and at Vanderbilt University. Since 1964, Mr. Folsom has been employed by the FTC's Division of Economic Evidence. He has contributed to one published article (as a co-author) and to one FTC Staff Report. Mr. Folsom began his work on this case about two months prior to the trial. *Folsom Tr.* 2451, 2453; *GX* 140.

43. In assessing the weight to be given the Reports and testimony of defendants' expert witnesses, it is significant that all of them, except John Organ, have been employed and relied upon by the Government itself in the recent past.

Documentary Evidence

44. Extensive documentary evidence was introduced by both the Government and defendants, including statistical compilations, letters received from third parties during the course of discovery, articles appearing in trade journals, newspapers, and other publications, documents from the files of both the Government and defendants, and reports compiled by various public and private commissions.

45. With the exception of documents ruled inadmissible by the Court upon motion at trial, all deposition exhibits were received in evidence. *Tr.* 145.

Data Supplied in Response to Questionnaires

46. Upon order of the Court, Subpoena Questionnaires in a form agreed to by the parties were directed to coal producers and consumers throughout the midwest. Information was requested with respect to a wide variety

of production and consumption practices. The results of these surveys constitute, in effect, a coal census with respect to such matters as coal characteristics, coal distribution patterns, coal reserves, interfuel competition, and characteristics and capabilities of strip and deep mines and coal companies in the midwest. The comprehensive nature of the Subpoena Questionnaire survey can be seen from the fact that information was received with respect to 76,581,000 of the 77,310,200 tons of coal which the Government alleges, on the basis of data prepared by the National Coal Association, to have been consumed by utilities in the midwest. *DX* 49A, 54; *GX* 61.

47. Prior to the issuance of the Court's Subpoena Questionnaire, the Government sent out questionnaires of its own design to midwest coal producers, seeking information with respect to their past acquisitions, and with respect to coal sales, by destination, for certain years.

48. Statistical summaries were prepared on the basis of information supplied in response to both the Government's questionnaire and that sent out under subpoena. The parties agreed that, while none of the underlying data received in response to any of the questionnaires was required to be introduced into evidence, all parties would be free to make reference to such data both at trial and subsequently. *Tr.* 951-52; *DX* 49A, 49-56, 58-59; *GX* 32-33, 52, 54-61, 74, 86-91.

III. BACKGROUND OF THE DEFENDANTS

A. *GENERAL DYNAMICS CORPORATION*

49. General Dynamics is a diversified corporation selling to government services and agencies, and industrial and commercial customers. Over 85 percent of General Dynamics' annual sales are to government services and agencies, principally of aircraft, space, communications, and marine products. General Dynamics' sales to industrial and commercial consumers include commercial communication equipment, building materials, coal, lime and machinery. *Admitted by plaintiff, DPTF* 9.

50. In 1959, General Dynamics acquired Material Service Corporation ("MSC") as part of its attempt to diversify into commercial, non-defense business. *Nugent Tr.* 1842; *Maguire Dep. Ex.* 1, *p.* 1. MSC was at that time a midwest producer and supplier of building materials, concrete, coal and limestone, and owned all of the stock of Freeman and 34 percent of UEC's outstanding stock. *Admitted by plaintiff, DPTF* 10.

51. At the time of the GD-MSC merger, General Dynamics was also seeking diversification through development of commerial products stemming from such programs as the company's Convair 880/990 jet transports; Canadair's commercial turbo-prop CL-44 and CL-540 aircraft; General Atomic's nuclear research maritime and power reactors; Liquid Carbonic's industrial gases; and Stromberg-Carlson's telephone and high fidelity sound equipment. *Maguire Dep. Ex.* 1, *p.* 1.

52. By the time of the trial of this action, however, these diversification ventures had been discontinued or sold, with the exception of Stromberg-Carlson's communication equipment business. *Nugent Tr.* 1842-45. In the early 1960's General Dynamics' Convair Division phased out its commercial jet transport production program. During 1967, GD sold General Atomic to Gulf Oil Corporation, and in 1969, as a result of an adverse decision in *United States* v. *General Dynamics Corp.*, 258 F.Supp. 36 (S.D.N.Y. 1966), it sold Liquid Carbonic to Houston Natural Gas Corporation, *GF* § *IV*, ¶ 1 *at pp.* 5-6.

53. General Dynamics is not presently engaged in any aspect of either the electric utility or fuel industries other than the production of coal. *GX* 138.

B. *FREEMAN COAL MINING CORPORATION*

54. Freeman began as a coal sales company headquartered in Chicago. It was acquired by the Burton Coal Co. in 1922, the same year it acquired its first mine, the Bobby Dick, located in Williamson County, Illinois. *Nugent Tr.* 1829; *Nugent Dep.* 4; *Nugent Dep. Ex.* 38.

55. Throughout its history, Freeman's mining operations have been centered in Illinois in Jefferson, Franklin

and Williamson Counties in the Southern Illinois Freight Rate District.* In addition, it has operated the Crown Mine in the Springfield Freight Rate District in central Illinois. *Nugent Dep.* 4-9; *Nugent Dep. Ex.* 38.

56. In 1942, MSC acquired Freeman and the assets of Burton Coal Co., both of which companies were in bankruptcy. *Nugent Dep.* 14.

57. On December 31, 1954, Empire Building Corporation which, like MCS, was controlled by the Henry Crown family, acquired the stock of the Chicago, Wilmington & Franklin Coal Company ("CW&F"). *Nugent Tr.* 1831-32; *DX* 48.

58. After the acquisition of CW&F stock by Empire Building Corporation, Freeman operated the mines of CW&F and sold the coal which they produced. From 1955 forward, CW&F and Freeman were, for all practical purposes, one coal company. *Nugent Tr.* 1832-33.

59. The name and the location of each mine of Freeman, the estimated coal reserves in tons dedicated to each mine, and the other coal reserves owned in fee, under lease or optioned by Freeman, all of which are located in Illinois, as of December 31, 1968, were as follows:

* Freight Rate Districts are discussed below in Findings 286-88.

DEDICATED TO EXISTING MINES		OTHER COAL RESERVES	
Mine Location	Estimated Coal Reserves (Deep)	Counties in Illinois	Estimated Coal Reserves (Deep)
Crown Mine—Located adjacent to Farmersville, Montgomery County, Illinois	20,719,552	Macoupin	55,456,800
		Christian	11,642,400
		Montgomery	141,084,992
Orient No. 3 Mine—Located near Waltonville, Jefferson County, Illinois	33,582,320	Sangamon	11,760,000
		Williamson	16,498,272
Orient No. 4 Mine—Located near Marion, Williamson County, Illinois	5,315,408	Jefferson	97,961,664
Orient No. 5 Mine—Located near Waltonville, Jefferson County, Illinois	55,730,400		
Total Tons Dedicated to Existing Mines	149,333,280		
Total Tons Other Reserves			334,354,218
Total Tons All Reserves			483,887,408

GPTF § IV, ¶ 12 at pp. 8-9.

60. The Orient mines of Freeman are located in the Southern Freight Rate District and the Crown Mine is located in the Springfield Freight Rate District. Nugent *Dep.* 109; *Nugent Dep. Ex.* 38.

61. Among 37 coal producers in the Midwest, Freeman ranks 8th in terms of coal reserves in Illinois, Indiana and West Kentucky, but controls less than 4% of the

total midwest reserves controlled by these companies in 1968. Of the 9 "leading" * Illinois coal producers that reported their coal reserves, Freeman ranks 6th in reserve holdings. Of the 11 "leading" producers in the three state area, Freeman ranks 7th in reserve holdings. *DX* 61; *GX* 72, 85.

62. Of the more than 2 billion tons of coal reserves dedicated to existing mines in Illinois, Indiana and West Kentucky as of 1968, Freeman controls 149,333,280 tons or 6.5 percent. *DX* 62.

63. While Freeman's reserves in central Illinois are of relatively low BTU value and have a sulphur content of over 3 percent, substantially all of the reserves and production at Freeman's Orient mines are high quality, high BTU coal with a sulphur content of less than 2.5 percent, and ranging as low as 1 percent. Approximately one-half of Freeman's other reserves in Williamson and Jefferson County have a sulphur content of less than 1.5 percent. *Nugent Tr.* 1855-58; *Freeman Subpoena Questionnaire Response, Forms* 225.

64. Approximately 8 percent of Freeman's production is sold for metallurgical purposes, and an additional 10 to 11 percent is dust.* *Nugent Tr.* 1925, 1976.

65. All of Freeman's mines are deep shaft operations, and, aside from its relationship with UEC, Freeman has never operated any strip mines and has no experience or expertise in strip mining. *Freeman Subpoena Questionnaire Response, Form* 225; *Camicia Dep.* 52.

66. None of Freeman's mines or coal reserves are located in a Freight Rate District in which UEC operates a mine or controls reserves. *Nugent Dep. Ex.* 38; *Weir Dep. Ex.* 1; *DX* 60; *UEC and Freeman Questionnaire Responses.*

---

* The Government, in its statistical exhibits, has designated certain midwest coal producers as "leading producers." *See, e.g., GX* 79, 85.

* Dust is defined and discussed below, at Findings 351-54.

C. *THE UNITED ELECTRIC COAL COMPANIES*

History and Mines

67. United Electric was formed in 1919 as a consolidation of several coal properties located in the vicinity of Danville, Illinois. *GF* § *V*, ¶ 1 *at p.* 11. By 1929, it had expanded its operations to include the Cuba and Freeburg mines in Illinois and the Farmersburg mine in Indiana. *GX* 14, *pp.* 4, 12.

68. In 1930, as part of the attempt to gain financing for the opening of the Fidelity mine at DuQuoin, Illinois, UEC proposed to acquire the properties of the Electric Shovel Coal Corporation, which had three strip mines in Indiana; the resulting combination would have been the largest stripping operation in the United States. *GX* 17, *pp.* 3-4. This failed to materialize,* however, and UEC was subsequently forced to enter into an agreement with its creditors which gave substantial management rights to a Creditors' Committee. UEC operated under this agreement until 1938, and for the following five years, bank loan agreements continued to restrict capital expenditures and dividends. Thus, it was not until 1943 that UEC was "entirely free in managing its own affairs." * *Kolbe Dep. Ex.* 17, 46, *p.* 6; *Kolbe Dep.* 522.

69. As of July 31, 1939, UEC operated four strip mines in Illinois—Fidelity, Freeburg, Cuba and Buckheart—producing a total of 2,078,696 tons. Its mines were centered in the Fulton-Peoria Freight Rate District and the Belleville Freight Rate District. *Kolbe Dep. Ex.* 42, *p.* 2.

---

* Electric Shovel subsequently became Ayrshire Collieries. *Organ Dep.* 132.

* UEC's president during this period, Mr. Kolbe, credited himself with having put UEC's financial house in order, and claimed to have secured a loan for UEC in 1941 at such low interest rates that a banker could only classify him as a "humdinger." The record, however, shows that, in order to secure its 1941 loan, UEC was forced to pay interest at twice the then prime interest rate. *Compare Kolbe Dep.* 13-15 *with Kolbe Dep. Ex.* 45, *p.* 6, *n.* 2 *and DX* 218.

70. By 1948, United Electric's production had increased to 3,700,264 tons from six mines, including the Solar Mine opened in 1945 in Schuyler County, Illinois and the Buffalo Creek Mine in Madisonville, Kentucky. Its coal reserves stood at 81,362,499 tons, and the company claimed to be the largest strip coal mining company in Illinois. *Kolbe Dep. Ex.* 52, *pp.* 4-6.

71. The Solar and Freeburg mines were closed in 1949. *Kolbe Dep. Ex.* 53, *p.* 5.

72. In 1952, UEC opened the Skyline mines in Eastern Kentucky. This was a contour stripping operation leased from Island Creek Coal Company, which also served as exclusive sales agent for the mine. *Kolbe Dep. Ex.* 55, *p.* 5; *Morris Tr.* 260-261. The mine never produced the amount of coal expected, and it was closed in 1955 as a "disastrous failure." *Kolbe Dep.* 408; *Kolbe Dep. Ex.* 1, *p.* 4; *Morris Tr.* 263; *Camicia Dep.* 47.

73. In 1955, UEC opened the Mary Moore mine, a stripping operation near Danville, Vermillion County, Illinois. *GF § V, ¶ 2(e) at p.* 13.

74. In 1959, the Buffalo Creek mine was closed because it was not worthwhile to bring in bigger equipment that could have handled the higher overburden * being encountered. Moving in large stripping equipment was considered particularly inadvisable in view of the uncertain future of the homeheating coal market which the mine served. *Kolbe Dep.* 909; *Kolbe Dep. Ex.* 5, *p.* 7.

75. The Mary Moore mine was closed in 1965 upon the exhaustion of strippable reserves. *GF § V, ¶ 2(e) at p.* 13.

76. UEC presently operates only 4 strip mines, all in Illinois. The Cuba mine located in Fulton County was opened in 1924; the Fidelity mine in Perry County in 1928; the Buckheart mine in Fulton County in 1937; and the Banner mine in Fulton and Peoria Counties in 1960. *Kolbe Dep. Ex.* 43, *p.* 3; *GF § V, ¶ 1 at pp.* 11-12.

77. The Cuba, Buckheart and Banner mines are in the Fulton-Peoria Freight Rate District; the Fidelity

* Overburden is the soil and other material which rests on top of the coal seam.

mine is in the Belleville Freight Rate District. *Nugent Dep. Ex.* 38; *Weir Dep. Ex.* 1.

78. UEC produces no dust and no metallurgical coal, and has no production or reserves with a sulphur content of less than 2.5%. *UEC Subpoena Questionnaire Response, Forms* 225; *Morris Tr.* 480, 515; *Petersen Dep.* 10-11; *Steiner Tr.* 2257; *Simon Tr.* 37-38; *GX* 210, *exhibits* 13*a and* 17*a*.

UEC's Coal Reserves

79. UEC's midwest coal reserves owned, optioned or leased, may be divided into four categories: (1) strip reserves dedicated to UEC's four existing mines (52,033,304 tons); (2) undeveloped strip reserves at the Industry Field in Illinois (12,550,457 tons); (3) undeveloped deep reserves in the Round Prairie Field (44,251,574 tons); and (4) miscellaneous strip and deep reserves in Illinois at various locations (9,202,158 tons).* *DX* 60*A*.

(A) *Reserves Dedicated to Existing Mines.***

(1) At the Cuba Mine, UEC has 1,206,260 tons remaining, with a possible, but doubtful, acquisition of an additional 300,000 tons. This mine will probably cease production in 1970. *DX* 60*D*; *Nugent Tr.* 1860-1862; *Davis Tr.* 731.

(2) At the Buckheart Mine, 27,379,963 tons remain; there is the possibility of acquiring an additional 1,500,000 tons, although 500,000 tons is not presently available for purchase and the acquisition of the balance is extremely doubtful. These reserves, which include North Canton, have been sold to Central Illinois Light Company under a long term contract. *DX* 35; *DX* 60*D*; *Davis Tr.* 702, 732.

---

* UEC also controls reserves in Oklahoma and Colorado. By agreement of the parties, these reserves are not relevant to the issues in the litigation. *See DX* 60*A*, 47; *Tr.* 416.

** As is detailed in Findings 391-97, 428, these are UEC's only mineable reserves.

(3) At the Banner Mine, there remain 5,081,691 tons and there is a possibility of acquiring an additional 100,000 tons. This mine will probably cease production within 5 years or so. *DX 60D*; *Tarzy Dep.* 120-21.

(4) At the Fidelity Mine, 18,365,390 tons remain, with the possible acquisition of something less than 1,790,000 tons. *DX 60D.*

(B) *Undeveloped Strip Reserves at The Industry Field.* This field is located near the town of Industry, Illinois and lies across the McDonough-Schuyler county line. Initial acquisitions were made in this field prior to 1948. It consists of 12,550,457 tons of strip coal. *Inman Dep.* 188; *DX 60A.*

(C) *Undeveloped Deep Reserves at The Round Prairie Field.* This field is located in the Perry and Washington counties of the Belleville Freight Rate District in Illinois, and consists of 44,251,574 tons of deep coal. *Morris Tr.* 172; *DX 60A.*

(D) *Miscellaneous Illinois Strip and Deep Reserves Owned or Leased.* These reserves, totaling 9,202,158 tons, are in four locations: (1) 344,842 tons of strip coal in Fulton County near East Liverpool, controlled by the company since prior to July 31, 1958 as an "isolated" parcel; (2) 1,714,710 tons of strip coal in Perry County referred to as the "Gayle Field" and controlled by the company since prior to July 31, 1958; (3) 1,795,360 tons of deep coal in Vermillion County, Illinois at the site of the Mary Moore mine, closed in 1965; and (4) at the Fidelity mine, 5,347,246 tons of deep coal which UEC was required to purchase in order to obtain strip reserves from Union Collieries in 1958. *Morris Tr.* 222; *Morris Dep.* 309-310; *DX 60B, 60C.*

80. UEC has no reserves in the midwest other than those located in Illinois. *GF § VI, ¶ 11 at p.* 17.

81. Among 37 coal producers in the midwest, UEC ranks 11th in terms of coal reserves in Illinois, Indiana and Western Kentucky, but controls less than 1% of the total midwest reserves controlled by these companies in

1968. Of the 9 "leading" * Illinois producers that reported their reserves, UEC ranked 8th in reserve holdings. Of the 11 "leading" producers in the three state area, UEC ranked 10th in reserve holdings. *DX* 61; *GX* 72, 85.

82. Of the more than 2 billion tons of coal reserves dedicated to existing mines in Illinois, Indiana and West Kentucky in 1968, UEC controlled 52,033,304 tons or approximately 2½%. *DX* 60*A*, 62.

83. None of UEC's mines or coal reserves are located in a Freight Rate District in which Freeman operates a mine or controls reserves. *Nugent Dep. Ex.* 38; *Weir Dep. Ex.* 1; *DX* 60; *UEC and Freeman Subpoena Questionnaire Responses.*

UEC's Critical Reserve Position

84. Prior to 1955, UEC had examined more than 200 fields of coal reserves, but only 7 had been taken up in whole or in part; some of the best were dropped without investigation; UEC had not had a "real" land department, and its competitors had far better prospecting organizations. The company had not built properly for its future. *Kolbe Dep. Ex, Y, p.* 3; *Morris Tr.* 183-186; *Latimer Dep.* 8, 405-419; *Nugent Dep.* 411.

85. In its reserve program up to 1959, UEC committed "serious errors," lost heavily to competitors in Fulton County and lacked aggressiveness. *Kolbe Dep. Ex. N*; *DX* 13; *Inman Dep.* 105.

86. In 1955, UEC had a total of between 85 and 90 million tons of reserves. In comparison, Truax-Traer Coal Company that year had a total of approximately 314,000,000 tons of reserves. *Kolbe Dep. Ex. C, "Re-Cap" following p. II-4*; *GX* 23; *Kolbe Dep. Ex. D, "Re-Cap" following p. II-3.*

87. By 1960, Peabody Coal Company, Truax-Traer, Ayrshire Collieries, Southwestern and Midland Electric Coal Co. (all predominantly or exclusively strip mine companies), had reserves substantially greater than UEC.

* The Government, in its statistical exhibits, has designated certain midwest coal producers as "leading producers." *See, e.g., GX* 72, 85.

Kolbe Dep. Ex. O, p. 3; 79th Coal Report of Illinois 1960, Kolbe Dep. Ex. 26.

88. UEC's lack of reserves was well-known in the marketplace. The president of one midwest utility which had been purchasing coal from UEC for over a quarter of a century testified that "a number of years ago I reviewed with our operating people, our production people, the problem that we saw on the horizon, which was the diminishing reserves situation with United Electric." *Steele Tr.* 942; *see also Steele Tr.* 997; *Wood Tr.* 608-10, 678-79; *Davis Tr.* 702, 756-57; *Moser Tr.* 1521; *Abrahamson Dep.* 52; *Morris Dep.* 32-33; *DX* 77.

89. In the late 1950's, UEC began having trouble with its utility customers because of its reserve position. Some of its customers advised UEC that, in view of its lack of reserves, they could no longer consider UEC as a potential competitor for their business in the future. *Id.*; *see also Morris Tr.* 190-91, 436-40; *Morris Dep.* 32-33, 55-62; *DX* 112, *p.* 8. More than a year and a half before this action was filed, a contract extension proposed by UEC to one of its customers was returned unsigned with the observation that such an extension "would be meaningless in view of the limited Fulton County reserves that are controlled by your Company." *DX* 26.

90. Further recognition of UEC's reserve shortage prior to the filing of the Complaint may be seen in a note from Irving Crown to Frank Nugent in 1963 that UEC was reaching the end of the line on reserves, comments made at a Board of Directors Meeting of General Dynamics on September 30, 1966 to the effect that UEC had limited coal reserves and was having trouble in obtaining and keeping long-term contracts, and the statement in GD's "Invitation for Tenders" dated October 7, 1966 with respect to the limited life of UEC's existing strip mining reserves. *DX* 23; *Nugent Tr.* 1849-50; *DX* 112; *Nugent Dep. Ex.* 35, *p.* 3.

91. Frank Kolbe, UEC's former president, defended the company's coal reserve policy during his tenure on the basis that the Company had other uses for its money, and that, in any event, coal was a roller-coaster business in which many people went broke. *Kolbe Dep.* 231-232.

As he said, "You don't indulge in the expansion. It is quite a venture, this expansion of the coal industry." *Kolbe Dep.* 734-735. "We did not care to tie up money that would not be—for coal fields that might never be mined, and certainly would not be mined for a long time in the future." *Kolbe Dep.* 189, 300-302. However, even had UEC been stronger financially, Kolbe testified that he would have had the company develop heat transference systems to recover oil from shale and attempt open-pit mining of gold.* *Kolbe Dep.* 237-239.

92. Beginning in the fall of 1959 when John Morris became President of UEC and Frank Nugent became Chairman of its Executive Committee, and continuing to date, UEC made a vigorous effort to purchase additional strip coal reserves. *Ames Tr.* 1699; *Thorson Tr.* 591-92, 903; *Nugent Dep.* 412-15; *Nugent Tr.* 1940-1942; *Morris Tr.* 536; *Inman Dep.* 222; *Camicia Tr.* 1386, 1399, 1439-41; *Camicia Dep.* 161-164, 196-199; *Hopper Tr.* 1883, 1886; *DX* 113, *p.* 4080, 4086, 4138, 4196.

93. After control of UEC had been gained by Material Service/Freeman, in 1959, the fact that UEC should somehow obtain additional reserves was discussed by UEC Directors at regular intervals and it was made clear to UEC's management that all of the money necessary would be made available for the acquisition of reserves. *Nugent Dep.* 420, *DX* 113, *pp.* 4080, 4086, 4138, 4196. Mr. Camicia testified that, while he was president of UEC, he had a "blank check" from General Dynamics to acquire whatever strippable reserves UEC could possibly find. *Camicia Tr.* 1399. Similarly, Mr. Inman, who

---

* It was only upon prompting by Government counsel that Mr. Kolbe even mentioned coal reserves:

Q What about coal reserves?

A We would have acquired those coal reserves North of Canton, coal reserves over here in Vermillion County had they still been available, and also those in—we would have drilled much more extensively out in—

Q Industry?

A Industry, sure. The world, the sky's the limit. *Kolbe Dep.* 239.

had been UEC's Vice President of Operations, stated that he had an "open book" with respect to the expenditure of funds on the acquisition of coal reserves. *Inman Dep.* 205; *see also Morris Tr.* 536.

94. Subsequent to 1959, UEC's personnel were given extremely wide latitude in their search for additional strip reserves. They were not limited to the acquisition of reserves with a potential of immediate commercial development, but were instructed to acquire any reserves which might prove capable of being recovered profitably at any time in the foreseeable future. *Nugent Dep.* 421-22. As Mr. Camicia related at trial: "I didn't even put any reservations on it. I just said find some coal that could be stripped, and then I would decide whether it was worth buying or not. Anything that can be stripped, just so it is black." *Camicia Tr.* 1440.

95. Accordingly, UEC investigated many potential strip coal areas including the area south of the Industry field, the Augusta field, the Meredosia-Mount Sterling area, the Ripley-Mount Sterling area, the Meredosia area, the Spring Lake Township area, the Salt Fork field, the Sepo field, the Roodhouse field, the Belle Rive field, the Ottawa field and the Toulon field in Illinois; Gibson Clay, Fountain, Vermillion, Vigo and Spencer counties in Indiana; Butler, Davies, Hopkins, Muhlenberg, Webster, Lawrence and Breckinridge counties, Kentucky; and others in the three-state area. *Admitted by plaintiff, DPTF* 125.

96. These efforts were not successful, however, in acquiring new fields of strip coal reserves in the midwest. None of these fields were found to contain economically mineable coal. *Nugent Dep.* 436.

97. Subsequent to 1959, however, additions to UEC's reserves at existing mines were made at a faster pace than was true prior to the election of the Freeman-MSC representatives to UEC's Board. Thus, between August 1, 1949, and July 31, 1959, UEC produced a total of 35,591,999 tons of coal from its mines, but during this ten year period acquired only 350,000 tons more than it produced, or a total of 35,941,999 tons. In contrast, in little more than half the time—between August 1, 1959

and December 31, 1965—UEC produced a total of 27,976,011 tons, and acquired 15,400,000 tons of strip reserves more than it produced, or a total of 43,376,011. *GX* 23.

98. On all the evidence, it is clear that UEC's lack of strip reserves is in no way attributable to the acquisition of its stock by MSC and General Dynamics.

99. In view of the unavailability of economically mineable strip reserves in the west, UEC has undertaken exploration activities in the west. *DX* 29, 31; *Nugent Dep. Ex.* 35, *p.* 3; *Inman Dep.* 160; *Jensen Dep.* 6; *Tarzy Dep.* 390-91.

UEC's Lack of Deep Mining Experience

100. Since at least 1930, and continuing to date, UEC has had neither the equipment, personnel nor expertise required for successful entry into deep mining. *Morris Dep.* 77, 194-197, 218; *Morris Tr.* 159; *Camicia Tr.* 1392; *Camicia Dep.* 194; *Inman Dep.* 14-15, 29, 158, 171-74; *Tarzy Dep.* 110; *Ames Tr.* 1698, 1708; *Thorson Tr.* 588, 892.

101. Until 1959, in communications with stockholders, landowners and others in the industry, UEC held itself out as strictly a strip mining organization. The company stated in its 1956 Annual Report that for 38 years it had been engaged in the single business of mining coal by the strip or open pit method. *Kolbe Dep. Ex.* 2, *p.* 7. Periodically through the years, Frank Kolbe proclaimed that "underground mining is not our business" or the like. *DX* 1, 6, 8, 220, 221, 222; *Kolbe Dep. Ex. W; Kolbe Dep. Ex. X; Kolbe Dep. Ex.* 12-13; *Kolbe Dep.* 448-450. Kolbe never expressed any real interest in deep mining * and, as of 1955, top management of the com-

* Kolbe's lack of interest in deep mining is further demonstrated by his initial failure to decall during his deposition whether UEC had acquired the Round Prairie deep coal field, and his subsequent erroneous testimony that it must have been acquired when John Morris, rather than he, was president of UEC. *Kolbe Dep.* 200, 203. More than 20,000,000 tons had been acquired in this field while Kolbe was president. *DX* 60*B*.

pany had none.** *Morris Tr.* 159-65, 196-97; *Ames Tr.* 1697-98; *Inman Dep.* 180-81; *Tarzy Dep.* 108-113.

102. While Kolbe's deposition testimony on behalf of the Government was not completely consistent with his earlier writings, he did recognize that deep mining was "a very difficult job," a "tough business" and that "any organization would have to very, very careful going into the underground mining business." *Kolbe Dep.* 128, 130, 298. Kolbe explained why "we never did anything much" about underground properties:

> "We always needed more equipment and we needed money for various things. To have gone into something completely new would have absorbed that money. We didn't have it. . . . [T]hese deep mines, as I say, would involve a measure of creativity on my part that I was not able at that time, I felt, to deliver, and I did not care to go into a business which I felt needed so much creativity as that deep coal would. . . ." *Kolbe Dep.* 133-135.

103. UEC's two attempts in the 1950's to engage in drift mining were short-lived and unsuccessful.* A drift operation was begun in June of 1952 at the Buffalo Creek mine in West Kentucky. *Kolbe Dep. Ex.* 55, *p.* 5. The attempt "failed miserably," however, and the operation was closed in 1954. *Kolbe Dep. Ex.* 57, *p.* 6; *Morris Dep.* 197; *Tarzy Dep.* 267-68. The losses involved were substantial, and Kolbe admitted the company had been wrong in going into this operation, "which I might recall to you is a common happening in the deep coal industry." *Kolbe Dep.* 400-402.

** Only UEC's land man, Mr. Latimer, because of his longstanding recognition of UEC's critical reserve shortage and its lack on an aggressive acquisition program, showed any interest in deep coal reserves at the time. *Morris Dep. Ex.* 47; *Latimer Dep.* 59.

* A drift operation is the easiest method of deep mining. It consists merely of mining into an already exposed level seam of coal. Since the side of the coal seam is exposed and accessible, none of the difficulties involved in the construction of shafts, hoists, and the like are present. *Camicia Tr.* 1388-89.

104. In 1957 UEC purchased an experimental deep mining machine for use in a second attempt at drift mining at Buffalo Creek. The machine never worked and was junked. *Kolbe Dep.* 420-25; *DX* 1.

105. Under questioning by the Government as to what he might do *now* if he were running United Electric, Mr. Kolbe testified as follows:

> "A. I would look into the deep coal. I must say that I would be a little hesitant. I would be very, very careful about it, because I don't believe, for instance, that Freeman makes any substantial amount of money.
>
> "I think they are probably good operators. If people like that can't make money, why do you rush into a business like that?
>
> "Old Ben, which I think is a very well-run company, last year earned 35 cents a ton before taxes. That's no sort of profit to make. . . .
>
> "I would have had ideas, as a matter of fact, on different ways of deep coal mining. just like I did in strip coal mining. I might have revolutionized the whole thing."
>
> "Q. [By Mr. Cusack] As you did with the Wheel Excavator and with Unimite on stripping? *
>
> "A. Yes, yes, drills and one thing and another."
>
> "Q. All right."
>
> "A. I also was instrumental in getting the deep coal field into metallurgical coal. I mean, all of these things." *Kolbe Dep.* 207-208.

106. Prior to July 31, 1958, UEC had never acquired deep coal reserves not contiguous to strip acreage at existing mines. At July 31, 1958, UEC controlled only

---

* While Kolbe originally claimed to have invented Unimite and to have secured $20,000 in connection with it from DuPont, he was forced to admit during cross-examination that it was patented by someone else, and that UEC was required to pay royalties in order to continue using it. *Compare Kolbe Dep. Ex.* 2, *p.* 9; *Kolbe Dep.* 60-63, 83-84 *with Kolbe Dep.* 654-664; *Kolbe Dep. Ex. S and T.* In any event, use of Unimite was subsequently discontinued because of its dangerous ingredients. As Mr. Kolbe put it, "they banged a car of it into another car and it went bang." *Kolbe Dep.* 665.

a total of 17,710,000 tons of deep reserves adjacent to existing strip operations at the Mary Moore, Buffalo Creek or Fidelity mines. Five million tons of these deep reserves had been acquired between August 1, 1957 and July 31, 1958 from Union Collieries (Union Electric Company) in order to obtain contiguous strip reserves. *GX* 23; *DX* 60*B*; *Morris Tr.* 221-22; *Morris Dep.* 309-310.

Acquisition of the Round Prairie Field and Assistance from Freeman

107. Shortly after July 31, 1958, UEC began to acquire deep coal reserves in the Round Prairie field in Perry County, Illinois, *Morris Tr.* 170-172; *DX* 5. These acquisitions, at least in their initial stage, were an outgrowth of an undertaking by UEC for one of its customers two years earlier. *Inman Dep.* 164.

108. In 1956, UEC attempted to interest Amalgamated Industries, a company which had been a UEC customer for many years, in its reserves at the Fidelity mine as a fuel supply for a new plant. Amalgamated turned the proposition down because the life of the Fidelity reserves was not sufficient. *Kolbe Dep.* 672, 685-86. Instead, Amalgamated requested UEC to acquire deep coal reserves for it in the Beaucoup Field, Perry County, Illinois. *Dorrance Dep.* 7; *Morris Tr.* 168; *Inman Dep.* 139. Under the terms of the agreement reached, UEC was not to have "any right, title or interest to its own use or benefit" in the coal reserves it agreed to acquire for Amalgamated, unless the options were "dropped" by Amalgamated. *Kolbe Dep. Ex.* 61, *paragraphs* 4, 9.

109. UEC would not have acquired reserves on its own in the Beaucoup Field. *Inman Dep.* 156-57; *Ames Tr.* 1708; *Kolbe Dep.* 189. *Cf. Folsom Tr.* 2578.

110. Because of Amalgamated's interest in the Beaucoup Field, UEC began acquiring deep coal reserves for itself in the contiguous Round Prairie Field after July, 1958. *Inman Dep.* 164; *Sloane Dep.* 43-44; *Morris Tr.* 170-72; *DX* 5. By this time, John Morris and Frank Nugent were engaged in discussions and correspondence pertaining to deep mining possibilities. *Nugent Tr.* 1836-

87; *Morris Tr.* 169; *DX* 4; *Morris Dep. Ex.* 38. As Mr. Morris testified:

> "A. When we had any underground coal that looked like it had any possibilities, I discussed it with them [Freeman] as to whether or not we should make any move on it, to try and get it.
>
> "Usually Frank [Nugent] knew all about the field and knew what the possibilities were, and our prime interest was, of course, to try and find strip coal, but we did run across underground coal in our efforts, and when I did, I always talked to him about it.
>
> ". . . .
>
> "We had no underground people who knew anything about underground mining. We had no organization. We had no equipment readily available at all, and they [Freeman] did." *Morris Dep.* 76-77.

111. It was not until 1960, *after* Freeman representatives had joined the Board of UEC, that UEC first mentioned to Amalgamated the possibility that UEC might develop the Beaucoup or Round Prairie acreage. *Dorrance Dep.* 28-29, 34-35. Amalgamated was told, however, that the actual mining would be done in association with Freeman. *Morris Tr.* 173-75, 302-06; *Thorsen Tr.* 589, 894; *Ames Tr.* 1707-08. As Mr. Morris testified:

> "I told everybody I was discussing any underground proposition with that we would have to utilize the ability and knowledge of Freeman, with whom we were closely associated, if we went into any underground mining." *Morris Tr.* 306.

112. In September, 1960, Morris discussed with Nugent the possibility of Freeman doing a feasibility study on the Beaucoup and Round Prairie deep coal acreage. *Kolbe Dep. Ex. L; DX* 113, p. 4049; *Morris Tr.* 172-73; *Inman Dep.* 164.

113. Since at least 1958, UEC has made it a practice to confer with Freeman regarding any deep mining possibility, and in doing so relied upon Freeman's judgment and expertise. *Ames Tr.* 1698; *Thorsen Tr.* 588, 892; *Morris Tr.* 168; *Inman Dep.* 164-65, 198-99; *Tarzy Dep.* 265-66, 270-72. *DX* 14-17, 18, 21, 25, 28, 32;

Morris Dep. Exs. 4, 5, 32, 35, 42, 46, 55, 62; *Nugent Tr.* 1848; *Morris Dep.* 195-96, 207-10, 226, 235, 275.

114. The evidence demonstrates that UEC never gave serious consideration to its deep coal reserves until the management of Freeman and UEC became closely associated. It was because of this association that UEC, for the first time, disclosed in its 1961 Annual Report to stockholders that it controlled deep coal reserves. *Kolbe Dep. Ex. 7, p. 7; DX 113, p. 4105; Morris Tr.* 229; *Thorsen Tr.* 589.

115. Based on all the evidence, it is clear that UEC's failure to acquire deep mining experience and expertise is in no way attributable to the acquisition of its stock by MSC and General Dynamics, and that UEC would not have gone into deep mining had it not been affiliated with Freeman.

Prior UEC Merger and Acquisition Attempts

116. The evidence establishes that during the 1950's UEC recognized the need to stem its deteriorating competitive position and that a merger was the only realistic way available to achieve this.

117. Around 1955, merger discussions took place between UEC and Truax-Traer Coal Company. It was believed by the management and Board of UEC that such a merger would be helpful to UEC in order to gain additional reserves. *Ames Tr.* 1696. Though the discussions may have been initiated by Truax-Traer, throughout "United Electric was rather the suitor, and . . . Truax was the unwilling bride". *Thorsen Tr.* 585, 865-867; *Nugent Dep.* 335.

118. In 1955, Theron G. Gerow, a mining consultant, prepared a valuation of the coal reserves and major equipment of both UEC and Truax-Traer. *Kolbe Dep. Ex. C and D.* Shortly thereafter, Gerow prepared a "Report on Proposed Merged Illinois Operations, Truax-Traer Coal Company, January 1956," in which he recommended that Truax, UEC and Little Sister Coal Company merge. One of the reasons given was that "unlike most mergers, the reserves and operations of the three companies are extremely closely related and the reserves

practically contiguous. Such a close interlocking of interests presents many opportunities for operation improvements and economies." *Kolbe Dep. E, pp.* I-1, I-4.

119. Frank Kolbe was "most anxious" for a Truax-UEC merger, and thought "it was a tragedy that it didn't go through." *Nugent Dep.* 338; *Kolbe Dep.* 60. However, by letter of October 9, 1956 to Henry Crown, Kolbe downgraded the value of Truax in comparison to UEC, stating, for example, that "in Southern Illinois Truax has much larger reserves than we do, but I do not think this is a particularly good place to have reserves." * *Nugent Dep. Ex. A.*

120. These merger discussions between UEC and Truax-Traer were renewed in 1960, though without success since Truax would not agree to the proposed terms of the merger. *Nugent Dep.* 332-34; *Nugent Dep. Ex.* 49. Truax-Traer had acquired Little Sister in 1956 and subsequently was itself acquired by Consolidation Coal Company in 1962. *GX* 87; *Kolbe Dep.* 516.

121. Unlike the affiliation with Freeman, a UEC-Truax-Traer merger would have combined two competitive coal companies. *Kolbe Dep.* 457 *and see defendants' Findings* 346-60;

122. Prior to 1959, UEC also attempted unsuccessfully to acquire the Sherwood-Templeton Coal Company, Little Sister Coal Company, The Unity Coal Company and the Denmark and Harmattan properties of Ayrshire Collieries. *Kolbe Dep.* 517-523; *Camicia Dep.* 164-65.

123. Despite these attempts, since its formation in 1919, and prior to its association with Freeman, UEC acquired or merged with no other coal company. *See also GX* 87.

---

* A number of predictions concerning UEC's future prospects set forth in the letter or contained in an accompanying merger evaluation study prepared by Mr. Kolbe dated October 8, 1956, failed to materialize. *Compare Nugent Dep. Ex. A and Kolbe Dep. Ex. A with Kolbe Dep.* 357, 358, 367 371.

IV. BACKGROUND OF THE ACQUISITION

124. The initial acquisition of UEC shares by Material Service Corporation was in 1954 and amounted to 72,600 shares. *Admitted by plaintiff, DPTF* 145. This amounted to more than 10 percent of the stock of the company. *DX* 114. By July 31, 1955, MSC had acquired almost a quarter of the outstanding shares of UEC, and a year later held approximately 34%. *DX* 114. As a result of these acquisitions, MSC in 1959, requested and received representation on UEC's Board of Directors. *DX* 113, *p.* 3982. As stated in UEC's Proxy Statement for 1959: "The management and the retiring directors, recognizing that the stock holding of Material Service Corporation entitled it to representation on the Board of Directors, determined to include the five new nominees on the management slate of directors." These were Frank Nugent, President of Freeman, Barton R. Gebhart, Vice President of Freeman, Irving Crown, President of MSC, Milton Falkoff, Vice President and Treasurer of MSC, and Reuben Thorsen, a partner in Paine, Webber, Jackson & Curtis, one of whose clients, Incorporated Investors, owned 10 percent of UEC's stock. *DX* 114; *Thorsen Tr.* 582-84.

125. These five new directors were elected to the UEC Board at the stockholders meeting on October 30, 1959. *GX* 200, *p.* 3990. At the UEC Board Meeting on November 10, 1959, John M. Morris, UEC's Sales Vice President and a Director since 1954, was elected President. Frank Kolbe became Chairman of the Board, a position created by a change in UEC's By-Laws adopted at that meeting. An Executive Committee was also established at this meeting with Frank Nugent as Chairman and Crown, Falkoff, Kolbe and Morris as members. *GX* 200, *p.* 4003. Nugent remained Chairman of the Executive Committee until 1966 when he was also elected President of UEC. *Nugent Tr.* 1830. Within a few years after he was made Chairman, Kolbe sold his UEC stock and resigned as Chairman and Director. *Kolbe Dep.* 10.

126. Shortly after the initial acquisition of UEC stock by MSC, Frank Nugent, President of Freeman, came to

realize that UEC, because of its shortage of coal reserves, was a company in liquidation. *Nugent Dep.* 415; *Nugent Tr.* 1835. Freeman, however, had underground coal reserves that could be mined by Freeman to back up UEC. Without such backup reserves, UEC's customers would stop purchasing coal from UEC before its reserves were exhausted. With Freeman's back-up reserves, however, UEC could enter into long term contracts to run out the reserves it had. *Nugent Dep.* 415-418. As Mr. Nugent testified, "Without the underground reserves to back them up, they are in no position to mine coal on the last day that those reserves are available, and those people who are buying coal from United are not going to wait until the end of United's reserves to make arrangements for their fuel supply." *Nugent Dep.* 415; *see also Sherwood Tr.* 1450-52; *Wood Tr.* 610; *Davis Tr.* 702, 730-31, 756-57; *Hill Tr.* 1086-88, 1097; *DX* 66, 104, 105.

127. Upon his becoming President in 1959, John Morris visited with each of UEC's major contract customers, told them of the UEC-Freeman association and pointed out the advantages he thought would follow: "A backup for United Electric Coal beyond their period of life at the properties we had, the know-how of underground mining which they had and we didn't have, and generally a much stronger company for them to depend upon as a supplier, which was becoming more important all the time the way the big utilities bought coal." *Morris Tr.* 191-192; *see also Wood Tr.* 659-60, 672; *Tomey Tr.* 335-38.

128. In 1958 Frank Nugent suggested to Henry Crown (Chairman of the Board of MSC) that United Electric and Freeman merge. Crown was in agreement. The merger did not take place immediately, however, because of the intervening merger negotiations between General Dynamics and MSC beginning in 1958, and GD's subsequent financial problems. *Nugent Tr.* 1839-40; *DX* 7.

129. After he joined UEC's Board in 1959 and became familiar with the company's affairs, Reuben Thorsen also favored merging the operations of Freeman and United Electric because "United Electric had a strip coal problem . . . and the enlarging of the reserves was very

difficult to achieve and they had real problems. I could see the assets wasting away and the reserves in Freeman, as I understand it, were substantially greater, and that one company might well augment or supplement the other." *Thorsen Tr.* 586-587.

130. Based upon their review of the record, the expert economists for both sides at trial concluded that, as a practical matter, the merger of Freeman and UEC took place in 1959. *Steiner Tr.* 2253; *Folsom Tr.* 2461-62; 2572-73. Customers of the companies also took this view. *Davis Tr.* 701; *Steele Tr.* 999-1000; *Hill Tr.* 1083-84; *DX* 230. The plaintiff does not dispute this. *GF § VIII, ¶ s* 1, 3, 6, *at pp.* 42-44.

131. Frank Kolbe was not in favor of the 1959 restructuring of the Board and management of UEC. *Morris Tr.* 243; *Kolbe Dep.* 759-760. When asked if he continued to be active in the management of the company, Mr. Kolbe testified that "I did some things. There's always a question whether you should get out or whether you should stay. If you get out, like the refugee in Germany or whatnot during the Nazis, if you get out you are powerless to influence events. You get out, you save your reputation, you do a lot of things, but you are out and you cannot influence events. My friends still had and I still had a big investment in the corporation. I stayed." *Kolbe Dep.* 760.

132. General Dynamics' acquisition of Material Service Corporation on December 31, 1959 was investigated shortly thereafter by the Antitrust Division of the Department of Justice, which took no action. At that time, General Dynamics owned 34 percent of UEC's outstanding common stock while no other shareholder owned as much as ten percent. The extent of General Dynamics' ownership of UEC stock was reported to the public at large at that time and continuously thereafter. *Admitted by plaintiff, DPTF* 147. The ownership of UEC stock by MSC has been made public in proxy materials published by UEC and filed with the Securities Exchange Commission on September 29, 1954 and annually thereafter. *Admitted by plaintiff, DPTF* 145; *DX* 114.

133. During its investigation of General Dynamics' acquisition of Material Service Corporation, the Antitrust Division was informed of the fact of, and the extent of, General Dynamics' ownership of both Freeman and UEC. In response to a request from Robert A. Bicks, Acting Assistant Attorney General, Antitrust Division, GD forwarded to the Government, by letter of May 25, 1960, a copy (enclosed in Exhibit C to the letter) of the November 24, 1959 Proxy Statement issued in connection with the MSC-GD merger. *DX* 225; *Maguire Dep. Ex.* 1. In this Proxy Statement, the fact that GD would acquire both the Freeman and UEC shares upon the merger was specifically noted. *Maguire Dep. Ex.* 1, *pp.* 11, 13.

134. Throughout the early 1960's, GD continued to purchase UEC stock, and, by 1966, immediately prior to the Tender Offer for the balance of UEC's outstanding shares, GD held a total of 445,773 shares, or 66.15% of the outstanding shares of UEC stock. *GX* 225, 230. In addition, throughout this period, the Material Service Profit Sharing Trust owned 46,400 shares representing approximately 6.8% of the outstanding stock of UEC. *GX* 225. GD's control of UEC was continually disclosed to the public throughout the 1960's. *Admitted by plaintiff*, *DPTF* 145.

135. At the Board Meeting on September 30, 1966, the directors of GD authorized the corporation to make an offer to purchase the remaining outstanding shares of UEC. Mr. Sargent "reviewed the various considerations in support of the management view that the minority interest in UEC should be acquired and that Freeman and UEC should be combined as soon as possible, including a review of UEC's limited coal reserves and the resulting problems UEC had encountered in obtaining and keeping long term contracts, the ability of Freeman to provide a backup of reserves over the long term and finally the requirement for a new chief executive officer and other key personnel on which action should be taken promptly." *Maguire Dep. Ex.* 35; *see also Maguire Dep. Ex.* 34.

136. The tender offer was successful. As of December, 1966, GD had acquired at least 90% of the outstanding

shares of UEC, and shortly thereafter UEC became a wholly-owned subsidiary of General Dynamics. *GF § II, ¶ 4 at p. 4.*

137. The Government filed its complaint on September 22, 1967, alleging that the UEC-Freeman affiliation violated Section 7 of the Clayton Act, and praying that General Dynamics be required to divest itself of its interest in UEC. *Complaint.*

V. BACKGROUND ON THE COAL INDUSTRY

138. Coal mining today is in the midst of a period of rapid and pervasive change. Major readjustment in the structure and patterns of coal production and distribution have been required, and continue to be required. As the report of defendants' expert economist, Dr. Steiner, notes, these dramatic changes constitute "a basic challenge both to individual coal producers and coal mining as a whole." * *Steiner Dep. EX.* 2, *paragraph* 1, 2; *Steiner Dep.* 144-46. This change has taken place in what the expert economists for both sides recognize as an "energy market." *Folsom Tr.* 2455, 2556; *Steiner Tr.* 2138-49, 2246, 2385; *Steiner Dep. EX* 2, *paragraph* 10; *see also DX* 45, *DX* 102, *pp.* 13-14, 274; *DX* 150, *pp.* 52-54; *DX* 257, *pp. II-2-II-4.*

Changes in the Demand for Coal

139. In 1920, coal accounted for 78.4 percent of the energy resources consumed in this country. With the exception of the years during World War II, coal's share of the energy market declined steadily thereafter, and by 1968 represented only 21.4 percent. *DX* 85, *Table V, Figure IV.*

140. Since World War II, coal has been a decreasingly effective competitor for a number of uses and has been

* As long ago as 1955, the president of the Chicago, Wilmington and Franklin Coal Company, a midwestern coal producer, had commented that "the coal mining industry has run into a series of evolutionary changes which have caused a shrinkage in demand for its product and have brought severely competitive conditions." *DX* 48.

unable to maintain its position as the dominant fuel in these categories; its position has either disappeared entirely or has been seriously eroded by the encroachment of other fuels. *Netschert Dep.* 9; *Peterson Dep.* 50; *DX* 85, *p.* 1; *DX* 102, *pp.* 274-276; *DX* 216.

141. Coal consumption in the United States declined from 441 million tons in 1947 to 277 million tons by 1954, primarily because coal lost its railroad and home heating markets to oil and gas. *Admitted by plaintiff, GF § III, ¶ 3 at p.* 4.

142. There is no longer a railroad market for coal, and, since World War II, the use of coal for space heating has declined 80 percent or more. Furthermore, its use in the industrial market has failed to keep pace with the growth of industry during this period. *Netschert Dep.* 14, 81; *Peterson Dep.* 50; *DX* 85, *p.* 1; *DX* 85, *Table II, Figure II, Tables III, V, XI, XII, and XIV; DX* 102, *pp.* 274-76; *DX* 216; *Kolbe Dep.* 57, *p.* 5.

143. Coal's decline in these markets will continue as additional residential and industrial consumers convert to oil and gas.* *Netschert Dep.* 14, 157-158; *Gerber Dep.* 110; *Walker Dep.* 10, 12-13; *DX* 216.

144. The net result of these losses has been a diminished position for coal in the overall energy resource consumption pattern. Coal consumption in 1967 and 1968 was less than in 1947 and 1948. *DX* 85, *p.* 1, *DX* 85; *Tables III, IV, V, Figures III, IV; DX* 102, *pp.* 21, 275; *DX.* 216.

145. These national trends and patterns are paralleled in the midwest. *Netschert Dep.* 11, 119; *Walker Dep.* 7-14; *Peterson Dep.* 10-11; *Davis Tr.* 698-99; *Redard Dep.* 5-7; *Nix Dep.* 16; *Brazzale Dep.* 5-8; *Beck Dep.* 8-9; *King Dep.* 17; *Stiehl Dep.* 14-15; *DX* 85, *Table XI.*

---

* As one retail coal dealer in Chicago expressed it: "We feel that the retail coal industry, as an industry, if you can call it that, has a life of only about five years . . . . I think you could compare it to the ice business." *Petersen Dep.* 14.

Emergence of Utility Demand as the Principal Market for Coal

146. As a result of market losses to other forms of energy, the utility market has become the mainstay of coal production, although the use of coal has not kept pace with the growth of utility output. *Netschert Dep.* 139-40; *DX* 85, *Tables I, III, XV.*

147. But in the utility market as well, coal faces competition from other sources of energy, including not only natural gas, oil, and nuclear fuel, but also, through technological advancement, such emerging competitors as pumped storage and geothermal energy. *Tremmel Tr.* 800-03; *Walker Dep.* 14-25; *Peterson Dep.* 8-10; *DX* 85, *p.* 1; *DX* 85, *Tables VI, VII, VIII, X, XII, and XIII; D* 102, *pp.* 13-14, 274-76, 295-98; *DX* 150, *pp.* 52-54; 257, *pp. II-2-II-4.*

148. Coal's present dominant position in the utility industry will suffer increasing erosion, and nuclear energy may eventually displace coal entirely as an energy source for midwest utilities. *Netschert Dep.* 14, 38, 93-95. Ernest Tremmel, Director of the Division of Industrial Participation of the United States Atomic Energy Commission, expressed the view that, in the long term, electricity could be generated at the lowest cost by a utility system combining nuclear and pumped storage facilities,* together with gas turbine peaking units.** *Tremmel Tr.* 810; *see also DX* 215.

149. More immediately, air pollution abatement regulations will have an adverse impact on coal during the next 10 to 20 years due to their effect on interfuel competition and consumption patterns of coal. *DX* 85, *p.* 2; *DX* 89, *p.* 63; *DX* 216; *DX* 257, *p. II-4.* There will be a tendency to turn to other fuels—gas, oil, nuclear—as a means of coping with such regulations. The net effect will be an increase in the consumption of these fuels at the expense

---

* Pumped storage facilities are described in Finding 238.

** "Peaking units" are generating facilities put in operation during periods of high electricity consumption. *See Abrahamson Dep.* 38-39.

of coal. *Netschert Dep.* 69; *Tremmel Tr.* 803-04; *Peterson Dep.* 26, 28-39; *Walker Dep.* 23-25.

150. In their Report to the Federal Power Commission, the West Central Region Advisory Committee * predicts that in the midwest, coal's share of the electric utility market will decline from 72.2 percent in 1966 to 22.2 percent by 1990, and nuclear energy's share will increase from 1 percent to 69.7 percent in the same period. *DX* 257, *p. II*-5. As this Report states:

> "During the period 1970-1990, electric generation will be dependent upon five basic forms of energy—coal, gas, oil, hydro, and nuclear. . . . Coal, however, will be faced with continuing pressures from other forms of energy, and based on present trends the most significant competition will be from nuclear energy. . . . *DX* 257, *p. II*-9.

151. Thus, the competitive situation within the energy markets as a whole is already more fluid than it has ever been before and will become more fluid in the future. *DX* 85, *p.* 2. Dr. Bruce C. Netschert, an expert in energy economics concludes that:

> "Competition is today more severe, more keen, among the fuels and between the fuels and between the fuels and electricity, and . . . . inter-substitutability is also greater than it has been before. . . . . [B]oth this competition and thic inter-substitutability is likely to increase in the future. The choice facing the consumer is wider than ever before and will become still wider." *Netschert Dep.* 53.

---

* This Committee includes top executives of Commonwealth Edison, Northern States Power, Wisconsin Electric Power, Union Electric Company and Illinois Power Company, among others. *DX* 257, *p. iii-iv*. With the exception of Indiana, West Kentucky and Western Tennessee, the West Central Region encompasses all of the Government's so-called Eastern Interior Coal Province Sales Area (EICPSA). *DX* 257, *p. S*-1; *compare GF* § *VI*, ¶ *B(2) at* p. 18.

Changes in the Production of Coal

152. The fact that coal continues to be one of the suppliers of the energy requirements of the electric utilities reflects the success of coal producers in delivering coal at a low cost per BTU. *DX* 85, *Table XXIII, XXIV, DX* 102, *p.* 132; *DX* 257, *Table* 2, *p. II*-12; *Steiner Dep. Ex.* 2, *paragraph* 7. As the Report to the Federal Power Commission of the West Central Advisory Committee makes clear, "During the past twenty years the coal industry has contributed a great deal to the stability of fuel prices." *DX* 257, *p. II*-9.

153. That coal producers have been able to do this, despite sharply rising costs, reflects the technological revolution that has led to enormous increases in productivity, and to the ability to negotiate bulk shipment and unit train freight rates. Both coal prices and coal rail rates have increased far less than other prices in the economy. *Steiner Dep. Ex.* 2, *paragraph* 7; *DX* 85, *Tables XX, XXV, Figure VIII; DX* 102, *p.* 132; *DX* 150, *pp.* 54-55, 59-60, 62; *DX* 257, *p. II*-9; *DX* 257, *Figure* 2, *p. II*-18.

154. Since 1947, and despite a substantial rise in the level of the wholesale price index and labor costs, the delivered price of energy from coal has remained relatively stable. *Admitted by plaintiff, DPTF* 50. In fact, allowing for inflation, the price of coal at the mine-mouth today is actually less than it was at the beginning of the post-war period. *DX* 85, *Tables XX, XXI, XXIV.*

155. Since World War II, wage costs and fringe benefits have increased markedly in the coal industry. *DX* 85, *p.* 3; *DX* 85, *Table XVI; DX* 102, *pp.* 15-16, 132.

156. There has been a virtual revolution in mining technology, with the introduction of wholly new techniques, significant improvement in old techniques and a substantial increase in scale. *DX* 85, *pp.* 3-4; *Tables XVIII, XXII, XXVI, XXVII; Netschert* Dep. 88-90; *DX* 257, *pp. II*-2, *II*-9.

157. The effect of these technological changes has been to increase productivity (as measured in output per man-day) sufficiently to enable the F.O.B. mine price of coal

to be kept competitive and relatively stable in the face of general inflation in wholesale prices. *DX* 85, *p.* 4; *DX* 85, *Tables I, XIX, XXI, Figures VIII, IX; DX* 102, *Table* 40, *p.* 280; *DX* 102, *p.* 282; *DX* 257, *p. II*-9.

158. Since World War II, the increased competitive pressure on coal in the utility market has led to increased pressure on the railroads to offer lower rates and has generated major technological innovations in railroad transportation, such as the unit train, which have permitted lower rates. *DX* 85, *pp.* 4-5; *DX* 85, *Tables XXIII, XXIV, XXV; DX* 150, *pp.* 59-60; *DX* 257, *p. II*-15; *Netschert Dep.* 104-106.

Changes in the Structure of the Coal Industry

159. The effect of the changes since World War II in the patterns of coal consumption and marketing, in labor costs, in mining technology, in productivity, in coal preparation procedures and in transportation costs has been to enhance the economies of scale in coal production and to greatly increase capital requirements. This, in turn has led to an increase in the size of mines. *DX* 85, *p.* 5; *DX* 85, *Table XXVII; DX* 102, *pp.* 207-08; *Steiner Tr.* 2127-28.

160. Eighty three percent of the coal produced in 1967 in Illinois, Indiana and West Kentucky, for example, was produced at mines with annual production exceeding 1 million tons; and 49 percent from mines producing more than 2 million tons a year. *Admitted by plaintiff; DPTF* 44*A*. Moreover, of the 36 mines placed in operation or announced in Illinois, Indiana and West Kentucky since 1958, none was smaller than 500,000 tons annual capacity, 29 were of a 1,200,000 tons annual production size or greater, and 20 produced or will produce 2 million tons or more per year. *DX* 87, *Table* 4. Clearly, mines of this size can only be operated by large coal producers. A two million ton strip mine, for example, would cost between $12.7 million and $23.5 million to construct, depending upon the overburden ratio,* and would neces-

* The overburden ratio expresses the amount of overburden (cubic yards) which must be removed to uncover a ton of coal. *DX* 87, *pp.* 24-25.

sitate 40 million tons of coal reserves. *DX* 87, *Table* 5a.

161. There are fundamental differences between the mines of the eleven "leading" * coal producers in Illinois, Indiana and West Kentucky and the mines of the approximately 26 other coal producers. The latter are typically located in the West Kentucky or Southern Illinois Freight Rate Districts; have extremely limited coal reserves; produce small annual tonnages; operate only under very favorable strip mining conditions or are shallow deep mines; do not have substantial processing facilities; have limited transportation facilities; and usually sell through agents or dealers rather than directly to customers. They rarely sell under long-term contracts with utilities. *DX* 50; *King Dep.* 5-6, 38; *Stiehl Dep.* 4-5, 18-19; *Beck Dep.* 4, 8, 38-39; *Camicia Tr.* 1444-45.

162. These small producers do not and cannot constitute a substantial supply source for the energy requirements of electric utilities. Small producers are, for all practical purposes, in a "different business." *Beck Dep.* 8; *see also Steiner Tr.* 2240-41; *King Dep.* 38; *Stiehl Dep.* 18-19; *Beck Dep.* 39; *Camicia Tr.* 1444-45; *Davis Tr.* 694-95, 764; *Steele Tr.* 938-39; *Wood Tr.* 659-60; *Tomey Tr.* 333-38; *Schotters Dep.* 11-12; *Nicosin Dep.* 37-38.

163. The increasing predominance of the electrical utilities as purchasers of steam coal, the increase in the designed capacity of new electric generation units, and utilities' insistence on a large, reliable, and low price source of fuel over the 20 or 30 year life of a generating facility, have led to the emergence and survival of coal producers with large reserves, developing large mines which are devoted to serving a small number of customers on long-term contracts. *Steiner Dep.* 269-73; *Tomey Tr.* 333-38; *Steele Tr.* 938-39; *Davis Tr.* 694-95, 764; *Wood Tr.* 659-60; *Camicia Tr.* 1444-45; *Schotters Dep.* 11-12; *Nicosin Dep.* 37-38; *Steiner Dep. Ex.* 2, *paragraph* 4; *DX* 86, *pp.* 2-5; *DX* 216.

164. The progressive disappearance of the small coal producer reflects the disappearance of the railroad mar-

* In its statistical exhibits, the Government has designated certain midwest coal producers as "leading producers." *See, e.g., GX* 72, 85.

ket and the decline of the space heating market, the retail market and spot coal purchases by utilities. *Steiner Dep.* 276-80; *Steiner Tr.* 2127-28; *Folsom Tr.* 2581; *Steiner Dep. Ex.* 2, *paragraph* 5; *DX* 86, *pp.* 7-8; *DX* 216.

165. The coal industry has not only exhibited any signs of anticompetitive performance and behavior, but the past performance of the industry suggests there has been intense competition among coal producers. *Steiner Tr.* 2142-45; *Steiner Dep.* 193; *Steiner Dep. Ex.* 2, *paragraph* 3. As one utility executive put it, "I think we have as much competition today for our coal supply as we ever had." *Schotters Dep.* 17; *see also Wood Tr.* 661; *Stiehl Dep.* 16; *Hill Tr.* 1113; *Steele Tr.* 936, 940-41.

166. The already intense competition which midwest coal producers face is likely to increase even more in light of competition from nuclear energy and other alternative fuels, growing concern with air pollution, pressures from large, informed and capable buyers of coal, and the presence of a substantial number of viable coal competitors. Coal producers will be under continuing pressure to reduce costs and keep prices low if they are to continue to serve their last remaining large market for steam coal. "The large coal company" as Professor Steiner, defendants' expert economist put it, "will have no easy life nor protected position." *Steiner Dep. Ex.* 2, *paragraph* 8, 9; *see also Steiner Tr.* 2146-49, 2151-54; 2243-47, 2437-38; *Steiner Dep.* 185; *DX* 85, *pp.* 1-2, *DX* 102, *pp.* 13-14, 20-23, 274-294; *DX* 150, *pp.* 52-54; *DX* 216; *DX* 257, *pp. II*-2, *II*-4, *III*-6. As another of the defendants' experts saw it:

> "The fact that Commonwealth Edison is already on line or under construction with enough nuclear capacity to account for somewhere, as I recall, between a third and forty per cent of its total capacity by the mid-1970's, is very sobering for the coal industry." *Gerber Dep.* 26.

VI. BACKGROUND AND DESCRIPTION OF THE UTILITY INDUSTRY, THE PRINCIPAL MARKET FOR COAL

167. Since 1946, a constantly increasing percentage of total coal production has gone to electric utilities as railroad, retail, and industrial markets have been lost to other fuels. *DX* 85, *Table I; DX* 216. This trend was true in the midwest and will undoubtedly continue. *DX* 216; *Gallagher Dep. Ex.* 1-3; *Steiner Dep. Ex.* 2, *paragraph* 2. Thus, while some 70% of UEC's 1967 sales were to electric utilities, by January 1, 1969 more than 82% of UEC's mineable reserves had been sold to electric utilities under long-term contracts. *DX* 63; *UEC Response to Government Sales Questionnaire.*

168. In 1967, approximately 75 percent of the coal production in Illinois, Indiana and West Kentucky was shipped to electric utility generating stations. *Admitted by plaintiff, DPTF* 38. In each of the years 1965 through 1967, the largest coal customers in Illinois were steam electric utilities. *Admitted by plaintiff, GPTF § V, ¶ A* (13) *at p.* 20.

169. In 1967, 72% and 89% of the coal produced, respectively, in the Fulton-Peoria and Belleville Freight Rate Districts, wherein all of the mines of United Electric are located, was sold to electric utilities. 95% and 71% of the coal produced, respectively, in the Springfield and Southern Illinois Freight Rate Districts, wherein all of the mines of Freeman are located, was sold to electric utilities. *Admitted by plaintiff, DPTF* 38A.

How Utilities Purchase Coal

170. In considering whether a particular coal mine can compete for the business of an existing power plant, several factors must be weighed. These include the cost of coal at the mine, the location of the mine relative to the consumer's plant, transportation costs, the BTU content of the coal and the suitability of the physical and chemical properties of the coal produced by a given mine for the particular plant facility involved. *DX* 86, *p.* 2; *see also Findings* 283-96.

171. In the case of a new utility plant, coal supply arrangements are almost always made prior to plant construction, since the facility's coal burning equipment will be specially designed to handle the type of coal that is to be made available. Arrangements for transportation of the coal are also likely to be made in advance. As a result, the location and design of a plant are frequently determined by the coal supply arrangements that can be made. *DX* 86, *p.* 4; *Steiner Dep. Ex.* 2, *paragraph* 5; *Gerber Dep.* 62-63, 118; *Tomey Tr.* 334; *Gamble Tr.* 1261-62; *Corey Tr.* 1599; *Hill Tr.* 1095; *Nicosin Dep.* 37-38; 51-52.

172. Because of (1) the need to assure a supply of coal that satisfies the physical and chemical requirements of the equipment designed, (2) the complexities of administering multiple coal contracts and (3) the development of large-scale transportation arrangements with their attendant economies, coal supply for large power plants is likely to be developed with relatively few producers. Indeed, many plants are supplied by only a single producer from a single mine opened specifically to serve that single facility. Such supply arrangements also exist in the case of mine-mouth generating plants where the adjacent mining property is expected to meet the lifetime requirements of the plant. *DX* 86, *pp.* 2, 5; *Gerber Dep.* 19-23; *Steiner Dep.* 272-73; *Gamble Tr.* 1260-62; *Hill Tr.* 1099-1101; *Corey Tr.* 1607-10; *Davis Tr.* 748-51; *Nicosin Dep.* 37-41; *Ward Dep.* 17; *Abrahamson Dep.* 18; *DX* 93; *DX* 102, *pp.* 217-18; *DX* 150, *p.* 59, *DX* 257, *p. II*-15.

173. In arranging for its coal supply, a utility will not only seek the lowest possible price per BTU of delivered coal, it will also seek assurance of the coal supplier's capability of providing the required quantities of coal over a long period of time. Utilities are therefore concerned about the reliability of the coal supplier and his past record of performance in satisfying contractual commitments. *DX* 86, *pp.* 3-4. As one of the consumer witnesses emphasized, when a utility is arranging for the fuel supply for a modern generating station representing an investment of several hundred million dollars, it wants "to know that the people you sign a contract

with are able to produce on their end of it." *Tomey Tr.* 336, 338; *Gamble Tr.* 1263.

174. A utility will weigh heavily its previous experience with potential suppliers and will carefully investigate the availability of adequate reserves within the supplier's control to satisfy the contractual commitments. The utility will seek independent geological verification of the existence and size of the coal reserve and the physical and chemical properties of the coal, as well as the producer's technological capabilities. *DX* 86, *p.* 4; *Hill Tr.* 1113; *Gamble Tr.* 1263; *Wood Tr.* 678-79; *Steele Tr.* 996-97.

175. Since 1947, the average size of steam-electric generating plants, and units within those plants,* has increased enormously. By 1966, the average size of new units being installed was almost as large as the combined total size of *all units* at existing plants. *DX* 86, *Table following p.* 9; *see also DX* 257, *pp. III-1-III-3.*

176. The increasing size of electric power generating units and plants has been accompanied by an increase in the quantity of coal required at such facilities. A large, modern coal-fired generating unit of a thousand megawatt capacity would require, over its 30 year life, a total of 70 million tons, or approximately 2½ million tons of coal annually. A plant containing three such units (a size likely to become increasingly commonplace) would, therefore, require committed mineable reserves of well over 200 million tons. *DX* 86, *p.* 3; *Gerber Dep.* 89-91; *Gamble Tr.* 1248-49; 1260-63; *Corey Tr.* 1607-10; *Hill Tr.* 1095-97, 1101; *Tomey Tr.* 334, 337; *Davis Tr.* 694-95; *Schotters Dep.* 12; *Nicosia Dep.* 37-38; *Ward Dep.* 13-14; *DX* 93.

177. A 1000 megawatt plant may cost as much as 150 to 200 million dollars. This major investment can be jeopardized by a disruption in the supply of coal. Utilities are, therefore, concerned with assuring the supply of coal to such a plant over its life. In addition, utilities

---

* Steam electric generating plants are frequently made up of two or more units. One method of increasing a utility system's generating capacity is to add one or more units to an existing plant. *See, e.g., Moser* Tr. 1509.

desire to establish in advance, as closely as possible, what the fuel costs will be for the life of the plant. For these reasons, utilities typically arrange long term contracts for all or at least a major portion of the total fuel requirements for the life of the plant. *DX* 86, *p.* 3; *Gerber Dep.* 89-91; *Gamble Tr.* 1248-49; 1260-63; *Corey Tr.* 1607-10; *Hill Tr.* 1095-97, 1101; *Tomey Tr.* 334, 337; *Davis Tr.* 694-95; *Schotters Dep.* 12; *Nicosia Dep.* 37-38; *Ward Dep.* 13-14; *DX* 93.

178. Illustratively, of the 74 million tons of coal purchased in 1967 by midwest utilities (other than municipal utilities) from mines in Illinois, Indiana and West Kentucky, approximately 76 percent was purchased under contracts of 5 years or longer and 43 percent was purchased under contracts of 15 years or longer duration. *Admitted by plaintiff, DPTF* 42.

179. The long-term contractual commitments are not only required from the consumer's standpoint, but are also necessary from the viewpoint of the coal supplier.* Such commitments may require the development of new mining capacity. As a rule of thumb, a mine capable of producing a million tons of coal annually required in 1969 an investment of between six to ten million dollars. Coal producers have been reluctant to invest in new mining capacity in the absence of long term contractual commitments for the major portion of the mine's capacity. Furthermore, such long term contractual commitments are often required before financing for the development of new capacity can be obtained by the producer. *DX* 86, *pp.* 4-5; *Gerber Dep.* 90, 104-05; *Kolbe Dep.* 306; *Hill Tr.* 1101; *Gamble Tr.* 1260; *Corey Tr.* 1609; *Nugent Dep.* 431; *DX* 87, *p.* 27; *DX* 93.

Decline of the Spot Market for Coal

180. This trend toward long term contractual commitments to meet the total requirements of a particular electric power generating plant has tended to eliminate the spot market for coal. From time to time, a utility

* See, in this connection, *Tampa Electric Co.* v. *Nashville Coal Co.*, 365 U.S. 320 (1961).

consumer may purchase small quantities of coal on the spot market and long-term contracts are often written to permit some flexibility in this regard. However, because utilities are increasingly arranging for bulk transportation of coal supply on a long-term basis, the opportunities for spot purchases are declining except in those cases in which small mines may be located in such proximity to make them capable of providing some relatively small deliveries at low cost. *DX* 86, *pp.* 7-8; *Hill Tr.* 1099-1101; *Steele Tr.* 938-39; *Tomey Tr.* 333; *Gaunt Dep.* 10, 49-50.

181. The rail rate cost advantages of train-load deliveries compared to car-load deliveries are such as to limit the desirability of such spot purchases. Furthermore, the growing practice by coal producers of expanding mine capacity only to meet long term contractual commitments, and the gradual disappearance of the small truck mines has tended to limit the production capacity available for spot sales. *DX* 86, *p.* 8; *DX* 102, *pp.* 207-08; *Hill Tr.* 1101.

Competition for Utility Contracts

182. Because of the trend toward long term contracts and away from spot purchasing, competition in the electric utility market is not continuous in the sense that coal producers seek new orders from a given facility on a daily, monthly or even annual basis. Rather, competition tends to be a "one time thing." Once the initial coal contract is executed, competition to satisfy the coal requirements of a particular plant is effectively precluded for an extended period of time amounting to as much as 15 years or even the full life of the plant. *DX* 86, *p.* 5; *Gamble Tr.* 1262; *Tomey Tr.* 333-34; *Hill Tr.* 1095-96, 1101; *Davis Tr.* 694-95; *Corey Tr.* 1606-10; *Ward Dep.* 13-14; *Nicosia Dep.* 37-38; *Schotters Dep.* 12; *Steiner Dep. Ex.* 2, *paragraph* 11.

183. This competition for long-term supply contracts, rather than competition for the sale of coal already produced, is of a kind in which a small producer or a producer without large reserves cannot effectively partici-

pate. This has led to the disappearance of such producers as active competitors in the utility market. *Steiner Dep. Ex.* 2, *paragraph* 5; *DX* 86, *pp.* 3-5; *Steiner Tr.* 2127-28; *Folsom Tr.* 2581; *Camicia Tr.* 1444-45; *Sherwood Tr.* 1450-52, 1464; *Morris Dep.* 304; *see also Findings* 160-162.

184. Further, the innovations in the coal industry that have made competitive prices possible have created the need for large scale production and thus for large companies. *Steiner Dep. Ex.* 2, *paragraph* 7; *see also Findings* 159-164. As Professor Steiner concluded:

> "It seems to me that the increase in the size of coal-mining companies and the concentration of more production and fewer mines, and with more of the output of a given mine devoted to a particular source, have been just unavoidable parts of the total picture." *Steiner Dep.* 176.

Significantly, Mr. Folsom, the government's economist, agreed with this analysis. *Folsom Tr.* 2581.

185. Correspondingly, mergers within the *utility industry* have both diminished the number of utility companies and increased the purchasing power of those surviving. Since 1955, there have been more than 50 mergers among midwestern public utilities. *DX* 85, *Table XXIX; DX* 102, *pp.* 208-211; *DX* 181-83; *DX* 234, *p.* 8.

186. In 1967, the four largest utility companies in the midwest, ranked by coal consumption, accounted for 53% of the coal consumed by electric utilities in the states of Illinois, Indiana, Wisconsin, Iowa, Minnesota, Missouri-Kentucky, and Tennessee. Commonwealth Edison alone consumed approximately 33% of the total coal production of the Freight Rate Districts in which Freeman or UEC mines are located. *Admitted by plaintiff, DPTF* 40; *see also DX* 85, *Table XXX.*

187. Fuel expenditures are a major component of a utility's operating costs.* In light of this, electric utilities typically regard fuel purchasing as a top executive

---

* For example, in 1969, almost 50 percent of Commonwealth Edison's operating expenses, excluding depreciation, were accounted for by fuel and power purchases. *DX* 90, *p.* 4.

responsibility and the buyers are characteristically sophisticated about the available alternatives. This is another source of pressure on coal producers to seek to minimize costs and to keep prices low. George Gamble, a director of Union Electric Company, testified that coal contracts would characteristically be reviewed by the company's Executive Committee, as well as its Board of Directors. As he explained: "If you sign a [coal] contract for $130 million, why, you want to have a pretty good company feel of that before you undertake to do so." *Gamble Tr.* 1264. Similarly, Elmer Hill, formerly of TVA, testified to the care taken in evaluating coal bids:

> "We had a staff of engineers. Each time we evaluated offers for supply to any of TVA's facilities, the reserves were checked, the equipment to be employed in supplying the coal was evaluated. With the engineering knowledge and know-how as to mining, it could reasonably be determined what the cost for production would be." *Hill Tr.* 1113.

See also Gamble Tr. 1263-65, 1267-68; *Schotters Dep.* 3-4, 14-15; *DX* 150, *p.* 51; *Steiner Dep. Ex.* 2, *paragraph* 9, 12; *Steiner Dep.* 319-21; *Steiner Tr.* 2243-45, 2439-40; *Steele Tr.* 930-31; *Davis Tr.* 686-87; *Hill Tr.* 1071; *Moser Tr.* 1508; *Corey Tr.* 1580-82; *Tomey Tr.* 321-22; *Gamble Tr.* 1233-35; *Wood Tr.* 598; *Ward Dep.* 5-6; *Nicosin Dep.* 6-7; *Redard Dep.* 5; *Gaunt Dep.* 3-4, 41; *Morrison Dep.* 4-5; *Abrahamson Dep.* 3-5.

Bargaining Power Of Utilities

188. Further, utilities have and use the ability to play coal producers against one another. As the president of one utility stated: "We attempt to use whatever leverage we can to get the prices we can." He explained that his company at the outset attempts to get a low-cost contract with one coal supplier, and then tries "to use that leverage on our other suppliers to obtain substantially the same price." *Davis Tr.* 745, 759. Finally, interfuel substitutability provides an additional bargaining advantage to utilities. *Steiner Dep. Ex.* 2, *paragraph* 9, 12; *Steiner*

Dep. 319-21; 323-25; *Steiner Tr.* 2243-45, 2250; *Nicosin Dep.* 81; *Schotters Dep.* 12-13.

189. The bargaining power of utilities will increase even more in the years ahead, as midwest utilities pool their purchasing power by joining together to coordinate the planning, construction and utilization of generating and transmission facilities. *DX* 232, 233; *DX* 257, *Section IV and Appendices A, B, and C.*

190. As a result of the foregoing, and because they purchase coal in huge quantities, utilities have substantial market power vis' a vis' coal producers. George Gamble described this balance as follows:

> "Anytime that you are in a position to sign up over a period of 15 or 20 years for a block of business between $50 and $100 million, you've got power in the market, and [if] coal producers can get hold of a large contract, which would run over a number of years, why, they know what they can afford to do in the shape of opening mines and buying machinery, and it's a very important thing to them.
>
> "Consequently, there is a great economic power in the hands of the coal purchaser." *Gamble Tr.* 1264-65.

191. Recognizing the validity of this analysis, the Government concedes that utilities have at least "equal bargaining power" with coal producers in the midwest. The dimensions of that power are reflected in the Government's haste to point out that Commonwealth Edison does not take "unfair advantage" of midwestern coal producers. *GF* § *VI*, ¶ *C*(9) *at p.* 25.

VII. INTERFUEL COMPETITION

A. COAL IS FACED WITH INTENSE COMPETITION FROM OTHER FUELS

192. Energy resources consumed in the midwest include, among others, coal, natural gas, oil, nuclear energy and hydropower. *Admitted by plaintiff, DPTF* 13.

193. Coal, gas, oil and nuclear energy produce heat,

measured in terms of BTU's (British Thermal Units). Heat thus produced by any one of these energy resources can be used for various purposes, including the generation of electricity. Hydropower is also used to generate electricity. *Admitted by plaintiff, DPTF* 14.

194. Coal, oil and gas are also used to produce space and processing heat. *Admitted by plaintiff, DPTF* 15.

195. Coal, oil, gas and nuclear energy compete with one another in the utility, space heating and process heat markets; * electricity (including that generated by hydropower and pumped storage) in turn competes with coal, oil, gas and nuclear energy for parts of these same markets. *DX* 102, *pp.* 13, 274; *DX* 85, 1-2; *Tremmel Tr.* 800-803, 812-813; *Gamble Tr.* 1266-67; *DX* 3.

196. Coal's share of the energy market reached its peak in 1910. Since then, coal's position has been eroded in one market after another. The railoards, once coal's mainstay, have been completely lost to oil through dieselization. The use of coal for space heating has already suffered a dramatic decline and is expected to disappear completely within five to ten years at the most. *DX* 85, *pp.* 1-2, *DX* 102, *pp.* 274-76; *and see also Findings* 134-142.

197. Interfuel competition will continue to erode coals share of the energy market as more and more industrial consumers convert from coal to gas or oil, and as these fuels, along with nuclear energy and the emerging technology of still other alternative power generation sources, further challenge coal's share of the fuel needs of electric utilities. *DX* 150, *p.* 54; *see also Findings* 147-148.

198. Competition among fuels is a complex of economic, technological and political forces, and results from the ability and willingness of energy consumers, in light of these forces, to shift from one fuel or supplier to another. *DX* 102, *pp.* 13, 274, 276; *Gamble Tr.* 1267-68. As a recent report of the Federal Trade Commission points out in a chapter contributed to by the Government's rebuttal economist:

---

* Process heat is that used in the manufacture of chemicals, drugs, foods, glass, metals, cement and the like. *See DX* 102, *p.* 22.

"There is a high elasticity of substitution among coal, fuel oil and natural gas as raw materials from which energy is produced. This is particularly marked in the case of electric utilities which have constructed generating stations so they can ultimately consume any of the three principal fuels." *Folsom Tr.* 2493-94.

199. In determining the type of fuel to be used, a consumer reviews and evaluates a number of factors. Thus, the choice between competing fuels depends not only on delivered price, but on such matters as relative thermal efficiencies and differences in capital costs of burning equipment as well. The costs of storing, handling, and in some instances, disposing of the fuel by-products or residue, for example, are economic factors which can make a low-cost fuel the most expensive fuel. These costs become a particularly important consideration in selecting a proper fuel in locations where land costs are high and areas heavily congested. In some areas, operating considerations, such as air pollution control regulations, may require a premium priced fuel and foreclose consideration of others. *DX* 150, *pp.* 52-53; *Gamble Tr.* 1269-70.

200. Energy consumers themselves attest to the vigorous competition coal encounters from other fuels in the market place. As the representative of one midwest utility testified at trial: "Certainly competition among coal suppliers is a big factor [in controlling the cost of coal], but I believe overriding this, which sets the overall competitive picture, is the alternate fuel competition. There is competition among all fuels as well as among coal suppliers." *Wood Tr.* 661; *see also Steele Tr.* 936, 940-41; *Gamble Tr.* 1266-70; *Davis Tr.* 693, 698-700; *Moser Tr.* 1516, 1573-74; *Corey Tr.* 1585; *Tomey Tr.* 325-26; 403; *Hill Tr.* 1083; *Morrison Dep.* 8-13, 26; *Abrahamson Dep.* 28, 61-62; *Gaunt Dep.* 22-23; *Ward Dep.* 27-28; *Schotters Dep.* 9-11, 39; *Nicosin Dep.* 46-49; *DX* 36; *DX* 67; *DX* 71-72; *DX* 74-75; *DX* 78; *DX* 90; *pp.* 7, 9, *centerspread*; *DX* 93; *DX* 95; *DX* 96; *DX* 99; *DX* 100; *DX* 146; *p.* 8; *DX* 147, *p.* 13; *DX* 148, *p.* 6; *DX* 149, *pp.* 3, 12-13; *DX* 230; *DX* 242.

201. Coal producers, as well, confirm the intense competition they face from suppliers of alternate fuels. *Beck Dep.* 8; *King Dep.* 17; *Stiehl Dep.* 14-16. When the president of one midwest coal company was asked for specific examples where competition from other fuels had had an effect on his ability to sell coal, he responded "I have as many examples as you have time." *Stiehl Dep.* 14.

Competition from Gas and Oil

202. The extensive competition which coal faces from gas and oil may be seen in the responses of midwest coal consumers to the questionnaire forwarded them under subpoena issued by the Court. While the survey was directed solely to coal consumers, and thus takes no account of facilities consuming *only* other fuels, it reveals that, even among those midwest facilities (both utility and non-utility) which consume substantial amounts of coal, some 48% have already installed the capability of consuming either gas or oil as well. *DX* 59, *Table C.*

203. The Subpoena Questionnaire responses also demonstrate widespread actual usage of gas and oil as alternative fuels by these utility and non-utility facilities. Thus, nearly half of those facilities with an oil capability actually used oil during 1967 while of those facilities with a gas capability, 80 percent actually consumed gas for six months of the year or more. *DX* 59, *Tables C, D, E.*

204. Whether or not facilities actually consume gas or oil, however, their dual or triple fuel capability is a device used by them to play one energy source against another in keeping their fuel costs at a minimum. *Peterson Dep.* 9; *Wood Tr.* 600; *DX* 74; *DX* 149, *p.* 3.

Industrial Consumers

205. Coal has already lost its once dominant position with midwest industrial energy consumers. It has been estimated that 45 percent of all such facilities in the midwest have already turned to gas, while another 20 percent have switched to oil. *Walker Dep.* 11-12; *Peterson Dep.* 10.

206. The trend of industrial consumers away from coal is a continuing one. A recent fuel-use inquiry by the Chicago Department of Environmental Control, for example, revealed that, of the 9 responding manufacturing plants located within the City of Chicago which had earlier indicated in response to the Court ordered Subpoena Questionnaire that they were burning high sulphur coal, 6 have converted or will convert during the current year to use of gas and oil exclusively. Of the remaining 3, one indicated that it would be burning two-thirds more gas and oil and one-third less coal than in 1967, while the other 2 were switching from the use of high sulphur coal produced in Illinois to low sulphur coal from other areas. *DX* 239.

207. The evidence also demonstrates that many other midwestern industrial and institutional consumers are converting from coal to other fuels. Although defendants made no general attempt at trial to enumerate all such midwest conversions, numerous specific examples are found in the record. The facilities of American Distilling, Corn Products and Standard Brands in Pekin, Illinois; Hiram Walker and Keystone Steel in Peoria, Illinois; American Can in Green Bay; Northwestern States Cement in Mason City, Iowa; McDonnel-Douglas and Proctor & Gamble in St. Louis; American Maize in Roby, Indiana; the University of Chicago, the Metropolitan Sanitary District of Chicago, the City of Belleville, Belleville School District and St. Clair County, as well as the Government's own midwest facilities, for example, were shown to have discontinued recently the use of coal. *Davis Tr.* 690, 698-699; *Redard Dep.* 6-7; *Morrison Dep.* 9; *Steele Tr.* 1003; *Sant Stip.* 1-2; *Hemminger Stip.* 1-2; *Nugent Tr.* 1928; *DX* 224; *Stiehl Dep.* 15; *Middleton Dep. Ex.* 5.

208. Even the Courthouse in which this lawsuit was tried was shown to have been converted recently from coal to a combination of gas and oil. The evidence reveals, moreover, that the Government considers a careful economic appraisal of the relative merits of gas, oil, coal and other alternative fuels so important and common in its fuel purchasing decisions that the General Services

Administration has prepared a standard form—GSA Form 1289, Heating Fuel Economic Analysis—to assist in the process. *Nix Dep.* 16; *Brazzale Dep.* 5-8; *Brazzale Dep. Ex.* 1.

209. While environmental considerations play an important part in some decisions to convert from coal to other fuels, many are based on other economic grounds. *Redard Dep.* 7-9; *DX* 36, 67, 75.

210. The competition which coal faces for the business of industrial energy consumers will increase in the future, particularly in light of the relatively low cost of converting from coal to other fuels and the vigorous promotional activities of oil and gas companies in this area. *Walker Dep.* 12; *Peterson Dep.* 12; *DX* 187-90, 191-92, 194-214.

Utility Consumers

211. Oil and gas are also important competitors for the fuel requirements of midwest utilities. In some midwest states, for example, oil and gas already supply 50 percent of the energy requirements of electrical utilities.* *DX* 138, *pp.* 20, 24. As a report to the Federal Power Commission by a group of midwest utility executives points out, "Although coal is available in sufficient quantities in the West Central Region to supply the entire energy requirements of electric utilities in this region, competition will determine the extent to which coal will penetrate each market." *DX* 257, *p. II*-9.

212. While the Subpoena Questionnaire was addressed only to the coal-fired facilities of midwest utilities, it revealed that, even with respect to these, 55 percent were capable of burning gas and/or oil as alternatives to coal. Furthermore, 79 percent of the utility facilities equipped to consume gas actually did so for six months or more during 1967. Installation of multi-fuel capability is not

* Significantly, the only utility executive called to testify by the Government, Daric N. Miller, Manager of Electric Production, Kansas Power and Light Company, was from an area where 91 percent of the fuel requirements of utilities are supplied by gas, eight percent by oil and one percent by coal. *Miller Tr.* 1723; *DX* 138, *p.* 20.

confined to small generating plants. This may be seen from the fact that the facilities with multi-fuel capability consumed close to 50 percent of the coal shipped to large utility systems in the midwest. *DX* 59, *Tables C, D.*

213. Because of growing concern with air pollution, oil and gas are rapidly increasing their share of the fuel business of midwest utilities—even among those which, because of their close proximity to coal fields, have relied principally on coal to provide their generation in the past. Illinois' largest coal consumer, Commonwealth Edison, for example, which ten years ago had 58 coal-fired boilers in Chicago, today has less than a dozen. *DX* 92, *p.* 2; *see also Findings* 246-82.

214. Also leading to increased usage of gas and oil by midwest utilities is the fact that many utilities are increasing their capacity through installation of gas and oil peaking units.* *DX* 138, *Table* 6, *pp.* 73-86; *DX* 234, *p.* 4; *Wood Tr.* 600-02; *Abrahamson Dep.* 14-15; *Nicosia Dep.* 35-36; *Gaunt Dep.* 23-24.

215. The capacity which these peaking stations represent has increased substantially in recent years. For example, the most recently announced gas turbine peaking station of Northern States Power Company has a capacity of 300,000 kilowatts. This exceeds the average size of the coal-fired base-load units being installed only five years ago. *Compare Wood Tr.* 664 *with DX* 86, *Table following p.* 9.

216. Such peaking units represent a significant portion of the new capacity being installed by utilities in the midwest. *DX* 138, *Table* 6, *pp.* 73-86; *DX* 234, *p.* 4. Thus, the combined capacity of Northern States Power Company's gas and oil peaking stations (500,000 kilowatts) is equivalent to a coal-fired station consuming approximately one million tons of coal annually. *Wood Tr.* 602; *Gamble Tr.* 1248-49.

217. As the demand for electricity increases, greater use is made of the capacity at gas and oil peaking stations. *Wood Tr.* 617.

---

* "Peaking units" are generating facilities put in operation during periods of high electricty consumption. *See Abrahamson Dep.* 38-39.

218. It is only a present limitation on the availability of gas and oil which prevents these fuels from winning an even larger portion of the utility market from coal. There is an abundance of evidence in the record, however, indicating that many steps are being taken to increase the supply of these fuels in the midwest. *DX* 137, 162-70, 193, 198, 238; *Netschert Dep.* 22-24; *Peterson Dep.* 57; *Walker Dep.* 20-23; *Gamble Tr.* 1255-60. In light of this, midwest gas companies continue to stress their ability to offer "plenty of low-cost natural gas." *DX* 197; *see also DX* 195-96. As one of its own exhibits points out, the fault for any present shortage of supply is largely the Government's. *GX* 247; *see also Walker Dep.* 53 ,57.

219. In the utility market, coal is also faced with a secondary level of competition from alternate fuels. The growth in demand for electricity which has occurred in recent years is not due to increased demand for illumination—where electricity is faced with virtually no competition. Rather, it is due to expansion of the use of electricity for home heating, air conditioning and appliances—areas where the electricity which coal generates encounters severe competition from oil and gas. *Peterson Dep.* 12-13, 17-22, 50; *Walker Dep.* 10-11; *Tomey Tr.* 342; *Schotters Dep.* 13-14; *Nicosia Dep.* 62-63; *Steele Tr.* 1001-03; *DX* 189, 210-12.

220. Competition at the secondary level has become particularly intense in recent years with the development of the "total energy" concept where gas and oil are used not only to provide energy for heating, air conditioning and appliances, but for on-site generation of electricity as well. *DX* 85, *pp.* 1-2; *DX* 85, *Table XII; DX* 198-210, 213-14; *Tomey Tr.* 342; *Netschert Dep.* 44-46; *Peterson Dep.* 21.

Competition from Nuclear Energy

221. During the 1960's, the use of nuclear energy to generate electricity became a commercial reality, increasing still further the competition faced by coal. Thus, as of January 1970, there were sixteen nuclear plants

in operation, 48 more under construction, and an additional 41 had been announced. *DX* 108.

222. Midwest utilities have assumed a position of leadership in the development of nuclear powered generating stations. Commonwealth Edison, for example, was a pioneer in the field, and in 1960 opened the first privately financed nuclear generating station in the country. *DX* 99. Today, Edison and TVA, the midwest's two largest coal consumers, account for approximately 20 percent of the nation's private nuclear capacity on order, under construction or in service. *Corey Tr.* 1589.

223. TVA already has five nuclear units under construction which, when completed, will represent approximately 25 per cent of TVA's generating capacity. *Hill Tr.* 1075-77. At the close of 1970, Commonwealth Edison will have three nuclear units in operation. By 1973, the number will have more than doubled and some 40 per cent of its electric generating capacity will be nuclear. Beyond that, Edison already has plans for two more nuclear units to come on stream in 1976 or 1977. In total, these nuclear generators will have a kilowatt capacity equivalent to coal-fired stations consuming 20 million tons of coal annually. *Corey Tr.* 1585-88; *DX* 92, 97, 98. As Commonwealth Edison's spokesman at trial summed it up:

> "Well, as far as Commonwealth Edison is concerned, we have sort of put our eggs in the nuclear basket. We believe that nuclear power is the best way to provide base load electric generation, and we intend to move in this direction." *Corey Tr.* 1600.

224. Other utilities throughout the midwest are also committing themselves to nuclear energy. Northern States Power Company's first nuclear station becomes operational this year and will be joined by two others in 1972 and 1974, representing a total nuclear capacity of more than 1,600,000 kilowatts. *Wood Tr.* 602-03. Three Wisconsin utilities, Wisconsin Public Service Company, Wisconsin Power and Light Company, and Madison Gas and Electric Company have joined together to construct a large nuclear station which is scheduled to begin operations by 1972. *Abrahamson Dep.* 21-22, 28;

Morrison Dep. 10-11; *DX* 107; *Abrahamson Dep. Ex.* 1, 1*A*. Northern Indiana Public Service Company, Iowa Electric Light and Power Company, and Wisconsin Electric Power Company have also undertaken substantial commitments to nuclear energy. *DX* 108. Dairyland Cooperative Company already operates a small nuclear demonstration plant and plans to join with four other rural cooperatives in the construction of an additional 500,000 kilowatts nuclear station. *Moser Tr.* 1509, 1573-74.

225. Even those midwest utilities which have not already gone to nuclear energy emphasized their continuing interest in, and financial support of, nuclear research and development, and the possibility that they might undertake nuclear commitments in the future. They stressed that even now they closely compare and evaluate the overall costs of nuclear and fossil fuel stations in all cases before making a decision as to which type of new generating capacity to install. *Tomey Tr.* 326-29; *Steele Tr.* 936, 940; *Davis Tr.* 694; *Nicosia Dep.* 46-48; *Schotters Dep.* 10-11, 39; *Ward Dep.* 28, 51; *DX* 146, *p.* 8; *DX* 147, *p.* 13; *DX* 148, *p.* 6.

226. Even apart from environmental considerations, nuclear energy in the 1960's rapidly developed to the point where it was cost competitive with coal. In 1968, when TVA was planning a 3,300,000 kilowatt increase in its capacity, it carefully compared and evaluated both coal and nuclear fueled facilities and concluded that installation of a nuclear station "would be a decided economic choice over a coal-fired plant." *DX* 103, *p.* 15; *see also DX* 103, *Table* 1, *p.* 4; *Corey Tr.* 1600; *Moser Tr.* 1573-74.

227. The Atomic Energy Commission has considered nuclear energy to be a competitor of coal for the fuel requirements of electrical utilities—even in coal mining areas—since approximately 1965. *Tremel Tr.* 787-89, 800. As the director of the AEC Division of Industrial Participation explained at trial, fuel costs for a nuclear plant are "considerably cheaper than a fossil plant, and although the capital cost is higher, when you balance the total cost, this is why the utilities have gone to

nuclear, because the total operating cost will tend to be lower in many cases due to the cheaper fuel costs." *Tremel Tr.* 799.

228. The competition which coal faces from nuclear energy will become even more intense in the future. The Atomic Energy Commission has estimated that by 1980 between 20 and 25 percent of the nation's total generating capacity will be nuclear. Moreover, since these nuclear stations will be base-load facilities * which are more fully utilized than older fossil units, the AEC has also predicted that between 30 and 35 percent of the electricity actually generated in 1980 will be nuclear fueled. *Tremmel Tr.* 800-93; *see also Gerber Dep.* 53-54.

229. The impact of increased installation of nuclear generating stations on coal will be particularly severe in the midwest, where utility executives have reported to the Federal Power Commission that by 1990 nuclear facilities are anticipated to comprise 57 percent of total capacity—with nuclear generation "expected to supply nearly 70 percent of the region's energy requirements by that time." *DX* 257, *p. S-5.*

230. During the 1980's, when the so-called nuclear breeder reactor is expected to come into commercial use, coal's portion of the fuel business of utilities is likely to decrease further, with the possibility that it may ultimately be eliminated altogether. *Tremmel Tr.* 806-08; *Netschert Dep.* 38.

231. The most significant advantage of the breeder reactor over the present generation of nuclear generating facilities is that the breeder reactor will actually make more fuel (which can be used or sold) than it consumes—resulting in a "negative" fuel cost. *Gamble Tr.* 1249-50; *Tremmel Tr.* 806-07; *Netschert Dep.* 39.

232. While there are substantial economies of scale in the construction and operation of nuclear facilities, this does not preclude the use of nuclear energy by the small utilities in the midwest. *Tremmel Tr.* 791-92; *Steele Tr.* 963. On the contrary, several smaller utilities have already undertaken the joint construction of large scale

---

* That is, operated continually.

nuclear facilities. *Abrahamson Dep.* 19-20, 28; *Morrison Dep.* 10-11; *Moser Tr.* 1573-74; *Steele Tr.* 963.

233. Midwest utilities, moreover, are already joining together in power pools such as MAPP (Mid-Continent Power Planners) and MAIN (Mid-American Interpool Network) so that, among other things, such joint nuclear projects can be even more readily undertaken and efficiently coordinated in the future. *DX* 232, 233; *DX* 257, *pp. IV*-1-*IV*-11; *Wood Tr.* 683-85. Furthermore, companies with developed expertise and operating experience with nuclear energy such as Commonwealth Edison are available to lend technical assistance, and possibly supplies, to those undertaking nuclear commitments for the first time. *GX* 135; *Corey Tr.* 1978-79.

234. A utility that has constructed one nuclear fueled generating station is very likely to add another, so as to gain the most benefit from the nuclear experience already gained and the highly skilled nuclear personnel already employed. *Wood Tr.* 670; *Gamble Dep.* 24.

235. There was tremendous success in 1969 in finding low cost uranium, and the Government has a variety of tools at its disposal to assure that further development of nuclear energy to generate electricity is not adversely affected by nuclear fuel costs or availability. Moreover, successful development of the breeder reactor will remove all concern about nuclear fuel availability. *Wood Tr.* 676-77; *GX* 118; *Gamble Tr.* 1249-55; *Netschert Dep.* 97.

236. Quite apart from the utility market, nuclear energy has now developed to the point where its use as an alternative to coal for industrial facilities is already occurring, and can be expected to expand in the future as further technological advancements are made. *Tremmel Tr.* 812-813.

Other Alternate Power Sources

237. Hydropower has long been a competitor of coal in the midwest. TVA, the midwest's largest coal consumer, originally used hydropower exclusively, and today operates approximately 40 hydropower stations. *Hill Tr.* 1073-74; *see also DX* 102, *p.* 283. Coal's competition in the midwest from this source of energy is expected

to increase in the future in view of steps being undertaken to integrate the huge hydroelectric potential in Canada with power developments in the midwest through power pooling arrangements. *DX* 232; *DX* 257, *p.* S-5.

238. Pumped storage hydroelectric projects will further increase the competitive pressure on coal. At a pumped storage facility, water is pumped into an elevated reservoir by energy generated at the most economical base-load station during off-peak hours. During periods of peak demand, the cycle is reversed and the water runs down from the facility through hydroelectric turbines to generate power. *DX* 90, *pp.* 9-10; *DX* 223; *Netschert Dep.* 43-44. As pumped storage facilities are brought on line, older coal-fired stations can be retired. *DX* 176.

239. There is a growing commitment to pumped-storage power generation in the midwest. *DX* 90, pp. 9-10; *DX* 175, 177, 223; *see also DX* 85, *Table XIII.* Pumped storage facilities tie in well with nuclear generation, and an Atomic Energy Commission spokesman predicted at trial that, in the long term, electricity could be generated at the lowest cost by a combination of nuclear energy, pumped storage, and gas peaking. *DX* 90, *p.* 9; *Tremmel Tr.* 810.

240. Another alternative to coal expected to add to interfuel competition in the future is the generation of electricity by geothermal steam. In this method of generation, underground steam is tapped directly to provide power to drive turbine generators. While the installation of such facilities has thus far been confined to the west coast, some scientists estimate that by 1980 geothermal energy could be generating as much as ten percent of the total electrical output of the country. *DX* 178, 179. More immediately, increasing geothermal capacity on the west coast will free gas, presently required there for the generation of electricity, for use in the midwest. *Walker Dep.* 23.

241. Furthermore, other substantial research efforts are underway in the energy field that will no doubt increase the future level of interfuel competition. *DX* 102, *pp.* 295-98; *DX* 180.

Multi-Energy Companies

242. An additional aspect of the competition coal faces from other fuels is the fact that coal producers such as United Electric frequently find themselves competing with much larger corporate enterprises which produce and sell a variety of energy sources and can thus fill all of a utilities fuel needs, regardless of kind. In the past six years, the oil industry has established itself as a major element in coal production, linking under common ownership, in many instances, the energy resources of coal, oil, gas, uranium, oil shale and tar sands. *DX* 85, *p.* 5; *DX* 85, *Table XXVIII.*

243. Four midwestern coal producers are owned by oil companies: Pittsburg and Midway Coal Co. (Gulf Oil), Consolidation Coal Co. (Continental Oil Co.), Island Creek Coal Co. (Occidental Petroleum Corp.) and Old Ben Coal Co. (Standard Oil Co. of Ohio). In 1967, these companies accounted for more than 25 percent of the coal produced in Illinois, Indiana and West Kentucky. *DX* 85, *Table XXVIII; GX* 85.

244. A fifth midwestern coal producer, Ayrshire Collieries Corp., had announced plans in early 1969 to merge with Ashland Oil & Refining Co. The merger discussions were terminated, however, and Ayrshire subsequently combined with American Metal Climax, Inc., a major producer, fabricator and marketer of metals and minerals. *DX* 184-86; *Hopper Tr.* 1864.

245. Humble Oil, the principal operating subsidiary of Standard Oil (New Jersey) is constructing a deep mine in Illinois capable of producing three million tons per year for 20 to 30 years. Humble has entered into a long-term contract to sell the mine's output to Commonwealth Edison Company. Humble controls deep coal reserves in the midwest estimated at three billion tons. *Shipley Stip., pp.* 1-3; *DX* 61; *Nugent Dep. Ex.* 38. In addition to its sale of oil, natural gas and coal, Humble also has extensive holdings of uranium. *DX* 81, *pp.* 6-8.

B. AIR POLLUTION RESTRICTIONS WILL INTENSIFY THE COMPETITION COAL FACES FROM OTHER FUELS.

Enactment of Air Pollution Laws

246. Air pollution has become one of the nation's most difficult and urgent problems. *DX* 234, *p.* 6; *DX* 90, *p.* 2; *DX* 254, *p.* 1.

247. The burning of coal results in the emission of particulate matter and sulphur oxides. Significantly, these were the first two emissions to be designated as pollutants by the National Air Pollution Control Administration. *Middleton Dep.* 18; *DX* 254, *p.* 1; *DX* 151; *see also Moore Dep.* 17-18.

248. Beginning in 1955, the United States Department of Health, Education and Welfare undertook to study the effect of sulfur oxide and particulate emissions on health. Such study led the Department to conclude that these pollutants represented a serious health hazard when they exceeded certain levels in the atmosphere. The Department subsequently published the results of its studies, stressing particularly what it believed to be the minimum air quality standards for safety with respect to these pollutants. *DX* 89, *pp.* 1-3; *Middleton Dep. Ex.* 1, 3.

249. As a result of widespread concern over the deleterious effects of these pollutants, tremendous public pressure developed for the enactment of pollution control legislation and regulations to curtail their emission into the atmosphere. *DX* 71, *p.* 2; *DX* 136, 151-57. Even before such restrictions became effective in many areas, demands were made that utilities reduce their consumption of high-sulfur coal by substituting low-sulphur fuels. One citizen's group in Chicago, for example, placed a full page newspaper ad in July, 1969, under the banner headline "Caution: Commonwealth Edison is hazardous to your health." *DX* 136.

250. The result has been enactment of extensive air pollution abatement laws and regulations at the federal, state and local level. *DX* 89, *p.* 2-24; *DX* 139-43, 152; *Stanley Dep.* 4-5; *Moore Dep.* 4-7; *Middleton Dep.* 5-6.

251. While attention was focused at the outset on es-

tablishment of air pollution restrictions in major metropolitan areas, smaller communities have also begun to adopt air pollution regulations, and statewide regulation, where not already established, is anticipated. *DX* 89, *pp.* 2-24; *DX* 141, 143; *Moore Dep.* 13; *Moser Tr.* 1519; *Schotters Dep.* 30; *Netschert Dep.* 68-69; 74-75; *Griswold Dep.* 240-41. As defendants' expert witness on air pollution, S. Smith Griswold * testified:

> "I believe that you are going to have state-wide regulations similar to those in New Jersey, generally. If you don't have a state-wide regulation, you are going to have industries moving out into the rural areas, the less urbanized areas, and subsequent dislocation of your industrial developments. I feel that this probably won't be acceptable from the standpoint of the area that is losing . . . . industry because of the severity of [air pollution] controls, plus the fact that you will see a wide range of local reguations . . . . designed to keep areas, which are now clean, from being polluted. *Griswold Dep.* 240.

252. In light of this regulatory trend, electric utilities and other large coal consumers will not be able to avoid air pollution restrictions by locating future facilities in rural areas. Indeed, much of the demand for statewide controls is from residents of rural areas who do not wish to see their present relatively pollution-free environment deteriorate. *Griswold Dep.* 241; *Moser Tr.* 1517-20; *Netschert Dep.* 68. As the representative of one rural electrification cooperative testified at trial, the people in rural areas "feel that they have clean air now and they intend to keep it that way." *Moser Tr.* 1520; *Schotters Dep.* 30-31.

253. As air pollution regulations become more widespread they also tend to become more stringent. *Netschert Dep.* 74-75; *Griswold Dep.* 40, 151-52, 220-21; *DX* 85, *p.* 2.

---

* Mr. Griswold was formerly Assistant Director of the National Air Pollution Control Administration of the U. S. Department of Health, Education and Welfare, and for eleven years the Air Pollution Control Officer of the Los Angeles County Air Pollution Control District. *See Finding* 39, *supra.*

Abatement Techniques and Their Effect on Coal

254. The air pollution restrictions being adopted throughout the midwest are substantially increasing the already intense competition which coal faces from other fuels. Only coal burning leads to particulate emission. Similarly, while coal is the principal source of sulphur oxide pollution, gas and oil burning result in only negligible sulphur oxide emissions, and nuclear energy, of course, leads to none. *Tremmel Tr.* 803-04; *Peterson Dep.* 26, 28-39, 48; *Walker Dep.* 23-25; *DX* 89, *pp.* 26-31.

Precipitators

255. While electrostatic precipitators have been developed which are effective in controlling the particulate portion of the pollution emitted during the burning of coal, many consumers have found it more economical to convert to alternate fuels—or even to close down older facilities—rather than to install such devices in order to continue burning coal. *Steele Tr.* 935-36; *Davis Tr.* 689-91; *Tomey Tr.* 400-01; *Redard Dep.* 8; *DX* 160.

256. This is because electrostatic precipitators are extremely high cost items of capital equipment. *Tomey Tr.* 401. The installation of such equipment can cost 2 million dollars or more at a single facility. *Wood Tr.* 668; *see also Corey Tr.* 1639; *Schotters Dep.* 15; *DX* 234, *p.* 6.

257. Because of this high cost, electrostatic precipitators are not practical for small coal burning facilities. This has been recognized by the National Air Pollution Control Administration. *Middleton Dep. Ex.* 4, *p.* 3-19; *see also DX* 160.

258. Even for utilities, however, the cost of such equipment often represents such a high investment that it is more economical to convert from coal to the use of oil or gas. At the 359,000 kilowatt R. S. Wallace Station of Central Illinois Light Company, for example, six of the ten boilers were converted to gas because, as the president of the company testified at trial, "We cannot put electrostatic precipitators on these boilers economic-

ally." *Davis Tr.* 690-91. Similarly, the president of Interstate Power Company testified that his utility expected to discontinue the burning of coal at its Fox Lake Station altogether. He explained that rather than put in a $1,400,000 electronic or electrostatic precipitator, "we will probably change over to burning oil." *Steel Tr.* 935-36; *see also Tomey Tr.* 400-01.

Sulphur Oxide Control Devices

259. While equipment *is at least available* for reducing particulate emissions, the technology for controling sulphur oxides, the other principal pollutant emitted during the combustion of coal, is still under development. *DX* 234, *p.* 6; *DX* 254, *p.* 42; *Tomey Tr.* 358; *Moser Tr.* 1524; *Schotters Dep.* 15.

260. The significance of air pollution restrictions on interfuel competition and the marketing of coal is underscored by the fact that three of the Government's five rebuttal witnesses were called to testify regarding sulphur oxide pollution control devices. *Miller Tr.* 1723 *ff.*; *Craig Tr.* 2034 *ff.*; *Quig Tr.* 2172 *ff.*

261. The most that witnesses Craig and Quig would say, however, was that they believed their respective companies would be able to develop commercially acceptable sulphur removal devices within five years. *Craig Tr.* 2068; *Quig Tr.* 2201. Mr. Quig's company, however, has not even built a prototype facility. Mr. Craig's company has built such a model, but they have not been able to get it to work more than 20 percent of the time. *Quig. Tr.* 2185; *Craig Tr.* 2062. Both witnesses conceded that their devices would be quite costly, and that not a single utility had been persuaded to install one. *Quig. Tr.* 2178, 2191; *Craig Tr.* 2043-44, 2051, 2053, 2075-76. In the end, Mr. Quig admitted that sulphur dioxide recovery is "still elusive" and that utilities "may very well turn towards the use of substitute fuels." * *Quig Tr.* 2191, 2198.

---

* The Government has not seen fit to order any such devices in connection with the air pollution reduction program at its own facilities. Instead it has converted to lower sulphur fuels. *Griswold Dep.* 221-26; *Griswold Dep. Ex.* 3, 4.

262. Daric N. Miller, an executive of Kansas Power and Light Company, testified with respect to his company's decision to place the nation's first order for equipment on a base-load station—a sulphur pollution control device designed by Combustion Engineering Company. *Miller Tr.* 1732, 1783. Although he admitted that his company had encountered problems from the day it started up a smaller demonstration model of the device, Mr. Miller expressed the belief that the equipment would be reliable. *Miller Tr.* 1736-37. Mr. Miller stressed that his company's facility would not be operating on coal produced in Illinois, Indiana or West Kentucky. He also noted the importance of recognizing that the Combustion Engineering system was one "you have to engineer and design to a specific environment of plant." *Miller Tr.* 1727, 1776, 1780. He was unable to answer the question of whether the device would work elsewhere. *Miller Tr.* 1780.

263. The Combustion Engineering device *has been tested* on coal produced locally, however, by Union Electric Company at its Meramec Station near St. Louis. *DX* 89, *p.* 45. An executive from Union Electric Company testified that the device was "not commercially operable" and was, in fact, "shut down for more design changes" when he left St. Louis to appear at trial. *Tomey Tr.* 358, 400. The device was, in fact, operable for only one of the first nine months following its installation. *Griswold Dep.* 87; *DX* 89, *p.* 46; *Griswold Dep. Ex.* 5, *pp.* 2, 9-10. As Mr. Griswold summed up the situation: "They have corrosion problems, they have every kind of problem. They have got so many problems they didn't think about, that they haven't gotten around, in some cases, to figuring out what the answers are to things they planned to determine in this study." *Griswold Dep.* 87-88; *Miller Tr.* 1779-80; *see also Griswold Dep. Ex.* 5, *pp.* 9-10.

264. Recognizing the magnitude of the problems encountered with the Combustion Engineering system to date, other midwest utilities have rejected it. Combustion Engineering's representatives have publicly stated that "the system cannot be considered commercially acceptable at this time," and a Federal panel of air pol-

lution technology experts, like the experts retained by defendants, has concluded that even the system's presently known problems "may require several years of additional study." *Nicosia Dep.* 49-50; *Schotters Dep.* 15; *Griswold Dep. Ex.* 5, *p.* 10; *DX* 254, *p.* 58; *DX* 89, *pp.* 42-49. As a spokesman from Union Electric put it: "It's strictly an experimental unit." *Tomey Tr.* 400.

265. Recently, the National Air Pollution Control Administration of the United States Department of Health, Education and Welfare, commissioned a panel of technical experts to review the status of United States and foreign sulphur oxide abatement and control processes in order to provide a basis for increased governmental and public understanding of the problems involved in these areas. On the basis of its independent evaluation of oral and written presentations by 46 companies—including the three from whom representatives were called by the Government at trial—the panel

> "firmly concluded that, *contrary to widely held belief, commercially proven technology for control of sulfur oxides from combustion processes does not exist.*" *DX* 254, *p.* 3 *(emphasis in original); see also DX* 254, *pp. iii-iv,* 63-64; *GX* 210, *p.* 45, *paragraph* 12.

266. It is impossible to predict precisely when effective sulphur oxide pollution control devices will become commercially available. While witnesses expressed the hope that it would be soon, it may be ten years or more before such processes are refined to the point where they are generally available for installation on, or planning for, power plants burning coal. *Griswold Dep.* 54-55. Although there is a great deal of research taking place with respect to sulphur oxide pollution control technology, it is important to recognize that as long as 20 years may be required to go from paper studies through laboratory bench experiments, pilot plants, prototype plants, and commercial demonstration to commercial application. *DX* 89, *p.* 38.

267. As the recent study for the National Air Pollution Control Administration emphasized, "efforts to force

the broad-scale installation of unproven processes would be unwise; the operating risks are too great to justify such action, and there is a real danger that such efforts would, in the end, delay effective sulphur oxide emission control." Instead, the study urged a high level of government support for several years to encourage research, engineering, development, and demonstration of a variety of the more promising processes, as may be suited to specific local and regional conditions. *DX* 254, *p.* 3.

268. In any event, there will be a long delay between the time sulphur oxide control devices become commercially proven and their actual implementation. *Moore Dep.* 23. Five years or more of advance planning are required in the construction of a modern utility generating station. *Wood Tr.* 621-22; *Tomey Tr.* 359-60, 407-08. Government counsel asked one utility executive whether, for a new plant being designed to burn low-sulphur coal from Montana or Wyoming, his company would consider using high-sulphur coal produced locally if an effective sulphur oxide control system were developed. He explained the problem:

> "Well, here we have a timing problem because you have to start designing boilers well in advance of the unit. For a 1976 unit, we will have to start next year in making some final design decisions, and so we will not have the time to wait until we are assured that an SO_2 removal system would be available." *Wood Tr.* 622.

269. Adding to the competitive problems faced by coal, because of growing air pollution concern and regulation, is the fact that the control of particulate pollution and sulphur oxide pollution are negatively interrelated. In present particulate control technology, sulphur oxides are needed for ionization of the flue gases, so that equipment which reduces the sulphur oxide reduces the effectiveness of the particulate control equipment. *Moser Tr.* 1530; *Wood Tr.* 665-66; *Corey Tr.* 1686; *DX* 254, *p.* 44. In effect, as you solve one air pollution problem, you create another one. *Wood Tr.* 666; *GX* 210, *p.* 40.

270. Cost projections show that sulphur oxide pollution control equipment will be quite expensive in terms

both of initial capital cost and subsequent increased operating expenditures. *DX* 89, *Table* 5, *p.* 43; *Griswold Dep.* 188-89; *Craig Tr.* 2043-44, 2051, *Quig Tr.* 2178; *Miller Tr.* 1769-72. Such devices will be far more costly than particulate control equipment. *Wood Tr.* 667. In some cases, for example, the projected capital cost alone for installation of a single control device will exceed the total current $15 million Federal budget for research on the control of sulphur oxides. *DX* 89, *Table* 5, *p.* 43; *Griswold Dep.* 214-16.

The Expense and Experimental Nature of Air Pollution Control Devices Will Adversely Affect Coal Consumption

271. The lack of commercially acceptable sulphur oxide control devices, coupled with the increasing adoption of stringent sulphur oxide air pollution restrictions, has led to a switch on the part of many fuel consumers away from coal. As Commonwealth Edison summed up the situation in its latest annual report: "The best way for us to reduce air pollution is to burn less coal." *DX* 90, *centerspread.*

272. By 1973 Commonwealth Edison will be burning 50 per cent less coal in Chicago than it did in 1967, and by 1975 Edison's coal-burn will be cut in half again. *DX* 98. Three years ago Edison's Ridgeland Station, for example, burned nearly 1,200,000 tons of coal; today it burns none, but has instead, been switched to oil. *Compare Commonwealth Edison Subpoena Questionnaire Response, Forms* 150 *with Corey Tr.* 1632. Similarly, while Edison's State Line Station near Hammond, Indiana, consumed close to 2 million tons of coal in 1967, more than two thirds of the plant's electrical output is now fired by natural gas. *Compare Commonwealth Edison Subpoena Questionnaire Response, Form* 150 *with Corey Tr.* 1635.

273. During 1969, the gas burned in Commonwealth Edison's plants in and near Chicago replaced nearly 1,700,000 tons of coal. *DX* 92. Currently, an additional 1,400,000 tons of coal are being replaced by oil. *Corey Tr.* 1585; *DX* 90, *centerspread; DX* 162-63. Low-sulphur

coal from Montana, Wyoming, and Colorado is also being tested as a possible substitute for still more of the high-sulphur local coal presently consumed by Edison, *DX* 90, *centerspread; DX* 159; *Corey Tr.* 1594. Finally, Edison has made a substantial commitment to the use of nuclear energy, particularly in its future generation plans. *DX* 90, *centerspread; DX* 91-93; *DX* 95-100. Gorden Corey, Chairman of Commonwealth Edison's Finance Committee, emphasized at trial that "we believe this is the best way to take care of our massive electric generation problems with a minimum of disturbance to the environment." *Corey Tr.* 1600-01.

274. Like Edison, Northern States Power used its latest annual report to advise its shareholders of the steps it is taking in the face of growing air pollution concern and regulation. The report notes the conversion, for example, of some of its plants from coal burning to gas and oil fuel, and stresses the company's commitment to nuclear energy:

> By 1974, 35 percent of the company's total generating capability will be in nuclear units that do not produce dust or sulphur dioxide. By 1974 NSP will burn about 4 million less tons of coal annually than would have been required if coal burning units of comparable generating capacity had been built. That is a coal and sulphur dioxide reduction of 55 percent. *DX* 149, *p.* 18; *see also Wood Tr.* 604-05.

275. Other industry witnesses also noted the erosion of coal's competitive position because of the increasing concern over air pollution, and their expectation that the competition that coal faces from other fuels would increase even more in the future. As the president of one midwest utility put it: "We have always discussed every alternative fuel and looked at it, and we are doing so more in recent years because of air pollution." *Steele Tr.* 956. Indeed, as another utility executive testified, "Air pollution is getting to be the over-riding issue." *Tomey Tr.* 397; *see also Steele Tr.* 940-41; *Wood Tr.* 604-05, 668; *Davis Tr.* 693, 712-713; *Moser Tr.* 1517-20; *Corey Tr.* 1602-05; *Hill Tr.* 1134; *Gamble Tr.* 1326; *Schotters Dep.*

15-16; *Petersen Dep.* 10-14; *Morrison Dep.* 24-26; *Ward Dep.* 28; *Redard Dep.* 7-8; *Nicosia Dep.* 49; *DX* 71; *DX* 176, 178, 179, 187, 188, 191, 192; *DX* 234, pp. 6-7; *DX* 238, 239.

276. Coal producers also stressed the impact of air pollution regulation on coal consumption. *Beck Dep.* 9; *King Dep.* 17-18; *Stiehl Dep.* 13-14. The president of one coal company noted, for example, that immediately after the enactment of an air pollution ordinance in St. Louis, his company lost one of its major customers, because the company's coal had a higher sulphur content than permitted under the ordinance. *Beck Dep.* 9.

277. The capital and operating costs involved in air pollution controls are important economic factors which utilities will consider in determining what type of fuel to burn and what type of generating stations to construct for their system. *Wood Tr.* 668; *Corey Tr.* 1598. Such costs may well lead to the exclusion of coal from the competitive picture for some utilities in favor of other fuels. *Nugent Tr.* 1933-34. The impact of air pollution abatement measures on the consumption of various fuels by electric utilities was summed up by Dr. Bruce Netschert, defendant's economic and energy expert, as follows:

> "Well, as I previously indicated, I think that the impact of the sulphur aspect of air pollution regulations is to place coal at a competitive disadvantage, and this stated otherwise would mean that there would be a tendency to turn to other fuels as a means of coping with such regulations—gas, oil and nuclear.
>
> "To answer your question specifically, I would say that the net effect would be to tend toward an increase in the consumption of these other fuels at the expense of coal consumption." *Netschert Dep.* 69.

278. In light of the commercial unavailability of sulphur oxide pollution control equipment, many of the governmental restrictions adopted to date—particularly the more recent—have taken the form of a limitation on the amount of sulphur in fuel burned rather than a limitation

on the amount of sulphur oxide emissions. *DX* 89, *Table* 2, *p.* 14; *DX* 89, *pp.* 13, 23; *Griswold Dep.* 147. *Furthermore*, because of the time, expense, and difficulties in measuring emissions, practical enforcement of even the latter standards often takes the form of restricting the sulphur content in fuels burned. *DX* 89, *p.* 23; *DX* 89, *Figure* 1, *p.* 15; *Griswold Dep.* 147-50.

279. Coals whose sulphur content exceeds that proscribed by ordinance or statute cannot, of course, compete for the business of consumers located within the area of regulation. Because of its high sulphur content, for example, none of UEC's coal can be sold in Chicago.* *Compare DX* 89, *Table* 2, *p.* 14 *with Finding* 77; *see also Petersen Dep.* 10-11; *GX* 210, *p.* 14.

280. In light of existing and projected air pollution laws and the cost and experimental nature of air pollution control equipment, it is clear that over the next decade, air pollution limitations will have a serious impact upon coal's marketing patterns and its share of energy markets. Beyond that period, such limitations may well continue to constitute an important competitive handicap to coal's ability to compete with other energy sources. *DX* 89, *pp.* 23-24, 61-63.

C. *SUMMARY*

281. On the basis of the record as a whole with respect to interfuel competition and the impact of air pollution controls, Professor Steiner, accurately summarized what effect this will have on coal producers:

> "I think that air pollution considerations are going to make more difficult coal's role in the future. It seems perfectly clear that we are suddenly taking very seriously the matter of air pollution, and that air pollution control regulations will be enforced and that the coal users will either have to find substitutes for coal, find ways of finding a low sulphur coal or will have to introduce techniques for eliminating

* UEC can not acquire low sulphur coal reserves in the midwest to overcome this bar. *GF § VII, ¶ 6 at p. 41; GX 210; see also Findings 398-427.*

the sulphur dioxide and other pollutants that come out. None of these, as I suggested earlier, is going to be costless, and by virtue of being costly they are going to make the marginal consideration, let us say, between nuclear and coal closer; for a facility that is not close today, it will be closer tomorrow in my view because of this factor.

"It is a disadvantage under which producers who have high sulphur coal reserves are going to overcome, if they want to sell their coal." *Steiner Tr.* 2250-51.

282. In sum, not only does this intense level of interfuel competition explain a great deal of what has happened in the coal industry and to its markets, but its recognition is necessary to any valid predictions concerning the coal industry's future. Further, because it provides utilities particularly with a strong bargaining weapon in the negotiations with coal producers, it exerts strong competitive pressure on the market in which coal producers sell their form of energy. The crucial relevancy of these pressures in any assessment of the competitive effect of the United Electric-Freeman combination cannot be denied. *Steiner Tr.* 2138-39, 2245-46; *Steiner Dep.* 320; *Steiner Dep. Ex.* 2, *paragraph* 12.

VIII. MIDWEST COAL DISTRIBUTION PATTERNS

A. TRANSPORTATION FACTORS DETERMINE WHERE COAL MINES CAN COMPETE

283. The cost of transporting coal can vary widely depending on the relative location of the supplying mine to the coal consuming facility. For example, while there may be no transportation element in the delivered price to the mine-mouth generating station, the transportation portion of the delivered price to a facility located a great distance from the mine or mines which supply it may exceed the price of the coal itself. *DX* 86, *pp.* 2, 6; *Gaunt Dep.* 8, 51; *Nicosin Dep.* 42, 64-65; *Beck Dep.* 7; *King Dep.* 15; *Schotters Dep.* 7. *Compare, e. g., Central Illinois Public Service Company Subpoena Ques-*

tionnaire Response, Form 150, *with Wisconsin Public Service Company Subpoena Questionnaire Response, Form* 150.

284. Because they are such an important factor in the delivered price of coal, transportation costs largely determine those facilities for whose business coal mines are able to compete and those mines to which coal consumers can practicably turn for supplies. *DX* 86, *pp.* 2, 6; *Steiner Dep. Ex.* 2, *paragraph* 10; *Steiner Dep.* 218-19, 333-34; *Steiner Tr.* 2155-59; *Nugent Dep.* 117; *Morris Dep.* 304; *Netschert Dep.* 153; *Schotters Dep.* 7-8, 17; *DX* 85, *Table XXIII.* As the president of one midwest coal producer put it, "coal sales follow transportation arteries and freight rates." *Beck Dep.* 7.

285. As the Government's brief points out, the cost of transporting coal may approach 30 percent to 40 percents of its delivered price, and is a "critical factor" influencing the choice of suppliers by coal consumers which can "effectively segregate" coal producers in one area from those in another. *Govt. Brief, pp.* 11-12.

Freight Rate Districts

286. The Interstate Commerce Commission has designated various coal producing areas within Illinois, Indiana and West Kentucky as Freight Rate Districts. *Admitted by plaintiff, DPTF* 59; *see also Ayrshire Collieries Corp.* v. *United States,* 335 *U.S.* 573 (1949).

287. In maps and statistical compilations used by midwest coal consumers and producers, mines located in Illinois, Indiana and West Kentucky have long been commonly grouped according to the Freight Rate Districts in which they are located. *Nugent Dep. Ex.* 38; *Weir Dep. Ex.* 1; *Terleke Dep. Ex.* 2-11; *DX* 57; *Kolbe Dep. Ex.* 42, *p.* 2.

288. Responses to the Subpoena Questionnaire sent to midwest coal consumers show that each Freight Rate District in the midwest serves a distinct and definable area. This was confirmed by the testimony of producers and consumers and the responses to the Government's own sales questionnaire to midwest coal producers. *DX* 55, 56; *Wood Tr.* 606-07, 680; *Steele Tr.* 936-37; 1001;

Moser Tr. 1510; *Tomey Tr.* 332-33; *Davis Tr.* 695-96, 702-04; *Hill Tr.* 1087-89, 1094, 1098, 1127; *Gaunt Dep.* 6-7; *Ward Dep.* 11-12, 27; *Redard Dep.* 11-12; *Schotters Dep.* 7-8, 17; *Morrison Dep.* 18-19; *Nicosin Dep.* 41-44, 64-65, 70-71; *Beck Dep.* 6-7, 38-39; *King Dep.* 15; *Stiehl Dep.* 7; *Beck Dep. Ex.* 1; *DX* 69, 76, 77, 230, 231.

B. COAL QUALITY CHARACTERISTICS ARE ALSO A DETERMINING FACTOR

289. Responses to the Subpoena Questionnaire sent to midwest coal producers show that each of the Freight Rate Districts in the midwest produce coal with different and distinct characteristics. This was confirmed by the testimony of producers and consumers. *DX* 51; *see also Morrison Dep.* 16-18; *Netschert Dep.* 85; *Tomey Tr.* 335; *Gaunt Dep.* 21-22; *Abrahamson Dep.* 8, 11; *Serwood Tr.* 1452, 1486; *Petersen Dep.* 8-10, 47-48; *DX* 235.

290. These differences in coal quality characteristics reinforce the rigidity of the coal marketing patterns created by transportation factors, since, in order to maximize efficiency, boilers are generally designed with specific references to the characteristics of the coal which is to be burned in them. *Gamble Tr.* 1261; *Gerber Dep.* 61-63; *Steele Tr.* 944; *Moser Tr.* 1540; *Ward Dep.* 18-19; *Gaunt Dep.* 19-20; *Schotters Dep.* 8; *Nicosin Dep.* 56; *Camicia Dep.* 130; *GX* 210, *p.* 32; *see also Findings* 170-71.

291. As modern generating facilities become larger and more sophisticated, the range of coals which they are able to utilize becomes narrower, thus tying these stations even more closely to the Freight Rate District for whose coal they were designed. *Moser Tr.* 1516; *Tomey Tr.* 335, 367; *Nicosin Dep.* 78; *Abrahamson Dep.* 47-50; *Steele Tr.* 937; *DX* 235.

292. The careful attention paid to boiler specifications by midwest coal consumers when purchasing coal for their facilities can be seen in responses to the Subpoena Questionnaire. Eighty six and one-half percent of the coal-burning facilities in the midwest buy only coal meeting certain specifications with respect to *size*. Similarly,

61.2 percent specify *sulphur content;* 68.2 percent specify *ash content;* 70.2 percent specify *moisture content;* 60.2 percent specify *ash fusion temperature;* 66.4 percent have *BTU value* specifications; 61.2 percent specify only *washed* coal; and 28.4 percent have additional specifications not specifically covered in the questionnaire. In all, only eight percent of the coal consuming facilities in the midwest appear to buy coal without regard to its specifications. *DX* 53; *but see Davis Tr.* 697-98.

293. Furthermore, once a boiler has been constructed, modification so that it will accept coals with specifications other than those on which it was originally designed to operate is not practical. Thus, 88.5 percent of the midwest coal consuming facilities responding to the Subpoena Questionnaire—including 96.4 percent of all utility facilities—reported that modification of their boilers to accept other coals would not be feasible. *DX* 53; *see also Nicosin Dep.* 57; *Ward Dep.* 24-25; *DX* 158.

294. Having designed their boilers to accommodate coals from the Freight Rate District most favorably situated from a transportation standpoint, consumers refrain from using coals from other areas except in emergency situations such as a river flooding, wildcat strike or the like. As the president of one midwest utility explained:

> "As a public utility we are charged with furnishing 100 percent continuity of service, and we cannot experiment with any and every type of coal. We know what our boilers were designed for. We know that we have to stay within a close tolerance. For us to jeopardize our reliability by taking any and all coals would not be wise." *Steele Tr.* 944.

The chief engineer of another midwest utility recounted the difficulties his company had experienced when it experimented with coal that did not meet design specifications of the company's boilers. The boiler had to be completely shut down in order to remove the slag that had formed inside: "The first attempt at this was done with jack hammers. However, this was not too effective. So, finally we used the jack hammers to drill holes and used

dynamite to blast the slag out. We estimated between 40 and 50 tons of slag accumulated in this boiler." *Moser Tr.* 1516; *see also Ward Dep.* 19-22, 23, 47; *Nicosin Dep.* 54-55, 57, 59; *Gaunt Dep.* 20; *Morrison Dep.* 23; *Tomey Tr.* 335; *Wood Tr.* 607-608; *Steele Tr.* 938; *Peterson Dep.* 34-35, 47; *DX* 158.

295. A knowledgeable government employee testified that the Government would never buy coal without regard to its characteristics for its own facilities. *Nix Dep.* 14-15; *see also Nix Dep. Ex.* 1. The Government's official solicitation form for coal bids specifically provides that "whenever the bidder's guaranteed analysis of coal offered or the latest Bureau of Mines analysis of the coal offered shows the offered coal not to be in conformance with the specifications set forth in this Invitation, the bidder's offer shall be rejected as being non-responsive." *Burton Dep. Ex.* 1, *p.* 6.

296. While the Government in this lawsuit claims that "coal is coal," * the president of one midwest coal company aptly pointed out that "they don't want to buy it that way." He testified that, on the contrary, before the Government would even consider a producer's bid, it was required to "fill out a form about a mile long" showing that the offered coal met the facility's required specifications. *King Dep.* 8. As one utility executive put it, "coal is coal" is not an informative statement likely to be made by someone knowledgeable with respect to coal. *Nicosin Dep.* 50-51.

C. COMMONWEALTH EDISON COMPANY IS A UNIQUE COAL PURCHASER

297. The Commonwealth Edison Company, because of the number and capacity of its coal-fired electrical generating stations and the magnitude of its coal requirements, has, as is discussed below, a unique coal purchasing pattern.

---

* At a Pre-trial Conference before the Court on February 19, 1969, Government counsel stated: "Our position is that coal is coal. . . ." *Pre-trial Tr.* 6.

298. Commonwealth Edison Company annually consumes as much coal as the combined production of all the mines in both the Fulton-Peoria Freight Rate District and Springfield Freight Rate District, the two major Freight Rate Districts closest to its generating stations. During 1967, for example, while Commonwealth Edison consumed 18,102,000 tons of coal at its coal-fired stations, the Fulton-Peoria Freight Rate District and the Springfield Freight Rate District, produced, respectively, only 8,526,000 tons of coal and 9,741,000 tons of coal. *Compare DX* 55, *Table D-X with DX* 54.

299. Because of its substantial coal requirements and the location of its facilities, Edison must purchase coal from several Freight Rate Districts in Illinois. *Compare DX* 55, *Table D-X with DX* 54; *see also Corey Tr.* 1651; *Steiner Tr.* 2219, 2423-24; *GF § VI, ¶ C(8) at p.* 25.

300. Moreover, in order to minimize its overall transportation costs, Edison has a distribution pattern for the coal which it purchases that is quite distinct from that followed by other consumers. Consumers with facilities in Pekin, Illinois, for example, buy coal from the Fulton-Peoria Freight Rate District because of the transportation advantage which local producers enjoy over coal from the Springfield Freight Rate District. However, since Edison must buy coal from both Freight Rate Districts, it finds its overall transportation expenses can be minimized by shipping Springfield coal to Pekin and using Fulton-Peoria coal at its river stations. *Steiner Tr.* 2425-27; *Tarzy Dep.* 94; *Commonwealth Edison Subpoena Questionnaire Response, Form* 150; *Corn Products Subpoena Questionnaire Response, Form* 150.

301. In addition to its coal requirements, Commonwealth Edison also has the most extensive commitment to the use of nuclear energy for the generation of electricity of any electric utility in the world. *DX* 96; *see also Findings* 222-23.

302. Furthermore, Commonwealth Edison has undertaken an aggressive and accelerated air pollution control program which, among other things, will substantially increase the amount of nuclear energy, gas and oil used by Commonwealth Edison for the generation of electric-

ity. This program has resulted in and will continue to result in the closing of a number of coal burning facilities and will reduce the amount of coal consumed at others. *DX* 90, *centerspread; see also Findings* 271-73.

D. METROPOLITAN CHICAGO INTERSTATE AIR QUALITY CONTROL REGION IS ALSO A UNIQUE COAL MARKET

303. The federal Air Quality Act of 1967 establishes a comprehensive program for the designation of air quality control regions and for the enactment of air pollution regulations for such regions. One of the air quality control regions established pursuant to the Air Quality Act of 1967 is the Metropolitan Chicago Interstate Air Quality Control Region, also referred to as the Greater Chicago Air Quality Control Region. *Admitted by plaintiff, DPTF* 85.

304. Air pollution control regulations are in the process of being established within the Metropolitan Chicago Interstate Air Quality Control Region pursuant to the enactment provisions of the Air Quality Act of 1967. *Admitted by plaintiff, DPTF* 86.

305. The Metropolitan Chicago Interstate Air Quality Control Region consists of McHenry, Kane, Lake, Cook, DuPage and Will Counties in Illinois and Lake and Porter Counties in Indiana. *Admitted by plaintiff, DPTF* 62*A*(*i*).

306. The City of Chicago, by far the largest municipality within the Metropolitan Chicago Interstate Air Quality Control Region, has already enacted air pollution control regulations. *Admitted by plaintiff, DPTF* 87.

307. The air pollution control regulations adopted by the City of Chicago prohibit the burning in Chicago of fuels with a sulphur content of greater than 2.0 percent at the present, and 1.0 percent after August 31, 1972. *Chicago Municipal Code, Chapter* 17, *paragraph* 17-2.5 (3), *as amended, Journal of Proceedings, Chicago City Council, pp.* 8483-89. Similar regulations are anticipated for the rest of the Metropolitan Chicago Interstate Air Quality Control Region. *Corey Tr.* 1655, 1670; *Moore Dep.* 13.

308. The Chicago area, because it is a major transportation hub with direct railroad or water arteries to most of the Freight Rate Districts in the midwest, has been served in the past by producers in most midwest Freight Rate Districts. In no other significant industrial and population center in the midwest does this confluence of coal shipments from multiple Freight Rate Districts occur.* Because of existing and anticipated air pollution regulations, however, future competition will be limited to those producers of low sulphur coal in the Southern Illinois Freight Rate District and in the Murdock Freight Rate District. *Nugent Dep. Ex.* 38; *Weir Dep. Ex.* 1; *Steiner Tr.* 2222; *Stadell Dep.* 36; *DX* 51.

E. THE FREIGHT RATE DISTRICTS IN WHICH THE MINES OF UEC AND FREEMAN ARE LOCATED HAVE DISTINCT DISTRIBUTION PATTERNS.

309. All of the mines of UEC and Freeman are located in Freight Rate Districts in Illinois. The Cuba, Banner and Buckheart mines of UEC are located in the *Fulton-Peoria Freight Rate District.* The Fidelity mine of UEC is located in the *Belleville Freight Rate District.* The Crown Mine of Freeman is located in the *Springfield Freight Rate District.* The Orient Mines of Freeman are located in the *Southern Illinois Freight Rate District. Admitted by plaintiff, DPTF* 62*B.*

310. It is necessary to an accurate and realistic analysis of coal distribution patterns to consider purchases by *Commonwealth Edison* separately from those of other consumers. This is because of (1) the magnitude of Edi-

---

* See DX 55, Table D-P and DX 56, Table G-P. Thus, the results of both the Subpoena Questionnaire and the Government's Sales Questionnaire demonstrate that none of the following cities, for example, are served by such a multiplicity of Freight Rate Districts: Peoria, Moline, Rock Island, Davenport, (Tables G-1F, 2F; D-1F, 2F); Springfield, Decatur (Tables G-1S, 2S; D-1S, 2S); Minneapolis-St. Paul, Dubuque, St. Louis (Tables G-1B, 2B; D-1B, 2B); Paducah, Sheboygan, Green Bay, Waterloo, Cedar Rapids, Des Moines, Mason City, Milwaukee (Tables G-1So, 2So; D-1So, 2So). "G" Tables are found in DX 56, and "D" Tables in DX 55.

son's coal requirements (it is the largest coal purchaser in Illinois and the largest purchaser of coal from both UEC and Freeman); (2) the unique coal purchasing and distribution practices Edison has adopted to meet these requirements; (3) Edison's immense commitment to nuclear energy; and (4) the substantial impact on its fuel procurement policies which air pollution concern and regulation are already having. Combining Edison's coal purchases with those of other consumers would result in a significantly distorted picture of coal consumption and distribution practices with respect to both Edison and such consumers. *Steiner Tr.* 2218-20, 2325, 2376-77 *and see Findings* 297-302.

311. Because consumers in the *Metropolitan Chicago Interstate Air Quality Control Region* have historically been a unique coal market, because they presently face a common set of problems with respect to air pollution, and because past statistics with respect to coal consumption in this area are not a useful guide to either future coal consumption or use of alternate fuels in this area, it is also necessary to an accurate and realistic analysis of coal distribution patterns to consider purchases by consumers in this area separately from those of consumers in other areas. *Steiner Tr.* 2221-22; *and see Findings* 303-08.

312. In view of the differences in their coal purchasing practices—particularly, with respect to such matters as the size of their coal requirements and the length of their coal purchasing contracts—it is also helpful in analyzing coal distribution patterns to show separately purchases by utilities and purchases by non-utility consumers. *DX* 54, 58, 59.

313. As is detailed below, the results of the comprehensive survey of midwest coal consumers made pursuant to the Subpoena Questionnaire issued by the Court demonstrate that each of the Freight Rate Districts in Illinois in which the mines of Freeman or UEC are located serve distinct market areas. *See also Findings* 283-96.

Fulton-Peoria Freight Rate District

314. Coal mines located in the Fulton-Peoria Freight Rate District serve, in addition to Commonwealth Edison Company and coal consumers located in the Greater Chicago Air Quality Control Region, utility facilities located near or on the Illinois River between Meredosia and Ottawa, Illinois (the Fulton-Peoria Utility Sales Area), and non-utility facilities located in a pentagon between the Illinois River on the east from Meredosia north to Marseilles, the Mississippi River on the west between Muscatine and Clinton, Iowa, and Dixon, Illinois on the north (the Fulton-Peoria Non-utility Sales Area). *DX* 55, 56.

315. Producers and consumers confirmed that mines in the Fulton-Peoria Freight Rate District enjoyed a substantial transportation advantage with respect to the sales areas which they served. *Davis Tr.* 696, 703; *Redard Dep.* 11-12; *Sherwood Tr.* 1453-54; *King Dep.* 15; *Morris Tr.* 206-07, 219; *Nugent Tr.* 1923-25; *Tarzy Dep.* 196-97, 301-02. As the president of one coal producer whose mine was located in the Springfield Freight Rate District explained, mines local to Fulton-Peoria "had more advantageous transportation charges than we had. We had no chance to sell coal in the Peoria or Pekin" district. *Beck Dep.* 6. The natural advantage which Fulton-Peoria producers enjoy with respect to consumers in these sales areas is reinforced by the fact that the boilers of these consumers are generally designed specifically to operate on coal with the characteristics of that produced in the Fulton-Peoria Freight Rate District. *Davis Tr.* 697; *Redard Dep.* 7-8.

Consumption Statistics

316. In 1967, approximately 87% of the coal consumed by utilities in the Fulton-Peoria Utility Sales Area was produced by mines located in the Fulton-Peoria Freight Rate District. *Admitted by plaintiff, DPTF* 65.

317. In 1967, approximately 85% of the coal consumed by non-utilities located in the Fulton-Peoria Non-utility Sales Area was produced by mines located in the

Fulton-Peoria Freight Rate District. *Admitted by plaintiff, DPTF* 67.

Production Statistics

318. In 1967, of the coal produced in the Fulton-Peoria Freight Rate District which was sold to utilities, approximately 63% was sold to Commonwealth Edison Company, and the remaining 37% was sold to utilities in the Fulton-Peoria Utility Sales Area. *Admitted by plaintiff, DPTF* 66.

319. In 1967, of the coal produced in the Fulton-Peoria Freight Rate District which was sold to non-utilities, approximately 70% was sold to non-utilities located in the Greater Chicago Air Quality Control Region, approximately 24% was sold to non-utilities located in the Fulton-Peoria Non-Utility Sales Area, and approximately 6% was sold to non-utilities located in other areas. *Admitted by plaintiff, DPTF* 68.

320. In 1967, of the total coal produced in the Fulton-Peoria Freight Rate District, approximately 46% was sold to facilities located in the Fulton-Peoria Utility and Non-Utility sales areas, approximately 45% was sold to Commonwealth Edison Company, approximately 7% was sold to facilities located in the Greater Chicago Air Quality Control Region, and approximately 2% was sold to facilities located in other areas. *Admitted by plaintiff, DPTF.* 64.

Springfield Freight Rate District

321. Coal mines located in the Springfield Freight Rate District serve, in addition to Commonwealth Edison Company, utility facilities located within the Springfield Freight Rate District (the Springfield Utility Sales Area), and non-utility facilities located within the area in Illinois bordered by Springfield and Decatur on the north and Carlinville and Ramsey on the south (the Springfield Non-utility Sales Area). *DX* 55, 56.

322. With respect to consumers in these sales areas, mines located in the Springfield Freight Rate District enjoy a transportation advantage which acts as economic

barrier foreclosing competition from producers located in other Freight Rate Districts. *Beck Dep.* 6; *Davis Tr.* 692-93; *Morris Tr.* 206-07; *Nugent Tr.* 1923-25.

Consumption Statistics

323. In 1967, 100% of the coal consumed by utilities located in the Springfield Utility Sales Area was produced by mines located in the Springfield Freight Rate District. *Admitted by plaintiff, DPTF* 70.

324. In 1967, approximately 83% of the coal consumed by non-utilities located in the Springfield Non-utility Sales Area was produced by mines located in the Springfield Freight Rate District. *Admitted by plaintiff, DPTF* 72.

Production Statistics

325. In 1967, of the coal produced in the Springfield Freight Rate District which was sold to utilities, approximately 82% was sold to Commonwealth Edison Company, 16% was sold to utilities located in the Springfield Utility Sales Area, and 2% was sold to utilities located in other areas. *Admitted by plaintiff, DPTF* 71.

326. In 1967, of the coal produced in the Springfield Freight Rate District which was sold to non-utilities, approximately 93% was sold to non-utilities located in the Springfield Non-Utility Sales Area, and 7% was sold to non-utilities in other areas. *Admitted by plaintiff, DPTF* 73.

327. In 1967, of the total coal produced in the Springfield Freight Rate District, approximately 79% was sold to Commonwealth Edison Company, approximately 19% was sold to facilities located in the Springfield Utility and Non-utility sales areas, and approximately 2% was sold to facilities located in other areas. *Admitted by plaintiff, DPTF* 69.

Belleville Freight Rate District

328. Coal mines located in the Belleville Freight Rate District serve, in addition to Commonwealth Edison Company and coal consumers located in the Greater Chicago Air Quality Control Region, utility facilities located in East St. Louis, Illinois, St. Louis and Chamois, Missouri

and along the Mississippi River between Muscatine, Iowa, and Minneapolis-St. Paul (the Belleville Utility Sales Area), and non-utility facilities located in the Belleville Freight Rate District and in or near St. Louis, Missouri (the Belleville Non-utility Sales Area). *DX* 55, 56.

329. Mines located in the Belleville Freight Rate District enjoy a substantial transportation advantage with respect to consumers in these sales areas. Because of this, they have been the "natural source of coal" for these consumers, and mines in other Freight Rate Districts are not competitive with Belleville mines for the coal business of these consumers. *Moser Tr.* 1510; *Wood Tr.* 606; *Tomey Tr.* 331; *Steele Tr.* 1001; *Tarzy Dep.* 305-06. The naturel transportation advantage which the Belleville Freight Rate District enjoys with respect to these sales areas has led consumers located there to design their facilities to operate on coal with the characteristics of that produced by mines in the Belleville Freight Rate District. Use of coals from other areas can lead to "severe" operating problems. *Steele Tr.* 937; *Wood Tr.* 608; *Tomey Tr.* 335; *Moser Tr.* 1516, 1534.

Consumption Statistics

330. In 1967, approximately 80% of the coal consumed by utilities located in the Belleville Utility Sales Area was produced by mines located in the Belleville Freight Rate District. *DPTF* 75, *admitted by plaintiff.*

331. In 1967, approximately 98% of the coal consumed by non-utilities located in the Belleville Non-utility Sales Area was produced by mines located in the Belleville Freight Rate District. *DPTF* 77, *admitted by plaintiff.*

Production Statistics

332. In 1967, of the coal produced in the Belleville Freight Rate District which was sold to utilities, approximately 45% was sold to utilities located in the Belleville Utility Sales Area, approximately 40% was sold to Commonwealth Edison Company, approximately 8% was sold to utilities located in the Greater Chicago

Air Quality Control Region, and approximately 7% was sold to utilities located in other areas. *DPTF* 76, *admitted by plaintiff.*

333. In 1967, of the total coal produced in the Belleville Freight Rate District which was sold to non-utilities, approximately 65% was sold to non-utilities located in the Belleville Non-Utility Sales Area, approximately 24% was sold to facilities located in the Greater Chicago Air Quality Control Region, and approximately 7% was sold to non-utilities located in other areas. *DPTF* 78, *admitted by plaintiff.*

334. In 1967, of the coal produced in the Belleville Freight Rate District, approximately 47% was sold to facilities located in the Belleville Utility and Non-Utility sales areas, approximately 36% was sold to Commonwealth Edison Company, approximately 10% was sold to facilities located in the Greater Chicago Air Quality Control Region, and approximately 7% was sold to facilities located in other areas. *DPTF* 74, *admitted by plaintiff.*

Southern Illinois Freight Rate District

335. Coal mines located in the Southern Illinois Freight Rate District serve, in addition to Commonwealth Edison Company and coal consumers located in the Greater Chicago Air Quality Control Region, utility facilities located in the southern-most portion of Illinois, on the Mississippi-Ohio Rivers between Grand Tower, Illinois on the west and Paducah, Kentucky on the east, in the inland portion of northeastern Missouri, in Iowa away from the Mississippi River, in the southern tier of counties in Minnesota away from the Mississippi River, and in a triangle in Wisconsin and the upper peninsula of Michigan formed by Kenosha, Wisconsin on the south, and Ashland, Wisconsin and Marquette, Michigan on the north (the Southern Illinois Utility Sales Area), and non-utility facilities located in the southernmost portion of Illinois, in southeastern, northeastern and north central Missouri, in Iowa away from the Mississippi River, in the southern tier of counties in Minnesota away from the Mississippi River and in a triangle in Wisconsin and the upper peninsula of Michigan formed by Kenosha,

Wisconsin on the south, and Ashland, Wisconsin and Marquette, Michigan on the north (the Southern Illinois Non-utility Sales Area). *DX* 55, 56.

336. Because of the extremely high BTU value of the coal produced in the Southern Illinois Freight Rate District, and the favorable train routes which mines located there enjoy with respect to the sales areas they serve, mines in the Fulton-Peoria, Springfield and Belleville Freight Rate Districts are unable to serve customers located in these sales areas on a competitive basis. *Hill Tr.* 1088, 1098, 1106; *Tomey Tr.* 332; *Morrison Dep.* 16, 18-19; *Abrahamson Dep.* 11; *King Dep.* 6-7; *Stiehl Dep.* 7; *Sherwood Tr.* 1453-54. Boilers designed to utilize high BTU coal from mines in the Southern Illinois Freight Rate District will not operate properly on coal from the Fulton-Peoria, Springfield, or Belleville Freight Rate Districts. *Petersen Dep.* 8-10, 34-36, 45-47; *Morrison Dep.* 16-19, 23; *Abrahamson Dep.* 8; *Nicosia Dep.* 59; *Morris Tr.* 506-09.

Consumption Statistics

337. In 1967, approximately 53% of the coal consumed by utilities located in the Southern Illinois Utility Sales Area was produced by mines located in the Southern Illinois Freight Rate District, and approximately 38% was produced by mines located in the West Kentucky Freight Rate District. *DPTF* 80, *admitted by plaintiff.*

338. In 1967, approximately 76% of the coal consumed by non-utilities located in the Southern Illinois Utility Sales Area was produced by mines located in the Southern Illinois Freight Rate District. *DPTF* 82, *admitted by plaintiff.*

Production Statistics

339. In 1967, of the coal produced in the Southern Illinois Freight Rate District which was sold to utilities, approximately 81% was sold to utilities located in the Southern Illinois Utility Sales Area, approximately 1% was sold to Commonwealth Edison Company, and approxi-

mately 17% was sold to utilities located in other areas. *Admitted by plaintiff, DPTF* 81.

340. In 1967, of the coal produced in the Southern Illinois Freight Rate District which was sold to non-utilities, approximately 55% was sold to non-utilities located in the Southern Illinois Non-Utility Sales Area, approximately 33% was sold to non-utilities located in the Greater Chicago Air Quality Control Region, and approximately 12% was sold to non-utilities located in other areas. *Admitted by plaintiff, DPTF* 83.

341. In 1967, of the total coal produced in the Southern Illinois Freight Rate District, approximately 75% was sold to facilities located in the Southern Illinois Utility and Non-utility sales areas, approximately 8% was sold to facilities located in the Greater Chicago Air Quality Control Region, and approximately 17% was sold to facilities located in other areas. *Admitted by plaintiff, DPTF* 79.

F. *SUMMARY*

342. In 1967, approximately 97 percent of the production in the Fulton-Peoria Freight Rate District, 100 percent of the production in the Springfield Freight Rate District, 98 percent of the production in the Belleville Freight Rate District and 85 percent of the production in the Southern Illinois Freight Rate District, was shipped to one or more of the market areas described in Findings 314 through 341. *Admitted by plaintiff, DPTF* 84. That is, *either* to Commonwealth Edison, the Chicago Air Quality Control Region or to the applicable Utility and Non-Utility Sales Areas.

343. The distinct distribution pattern of coal produced in each Freight Rate District and the distinct consumption pattern of consumers located in various sales areas detailed in Findings 314 through 341 establish beyond question that there is no mine that sells coal in either an Illinois or an Eastern Interior Coal Province Sales Area market and no consumer that purchases coal in either an Illinois or an Eastern Interior Coal Province Sales Area market. In light of this, *it is clear that there is*

neither an Illinois nor an "Eastern Interior Coal Province Sales Area" market. As the Government's economist testified, "you have to have the testimony from the people about the fact that they buy coal all over this area, etcetera, to justify saying this is an economic market." *Folsom Tr.* 2608. Thus, Professor Steiner observed, when asked to what conclusions the Subpoena Questionnaire response data with respect to coal distribution patterns led him:

> "Let me start with a couple of negative conclusions. It seems quite clear looking at that graph as well as the data that underlies it, that the talk of Illinois as a relevant market in which to appraise that merger makes very little sense, just in terms of where the coal from the areas in which those companies produce goes.
>
> "Second, it seems to make relatively little sense to talk of that area that was defined as the Eastern Interior Coal Province Sales Area. It is, I think, interesting, in fact perhaps very interesting, that none of the coal from those four producing districts goes into the state of Indiana." *Steiner Tr.* 2223.

344. Significantly, the Bureau of Mines Supervisory Industry Economist who compiled the data which the Government offers as support for its so-called markets testified that his statistics do not deal with specific markets but only report data on the basis of political boundaries. Moreover, he recognized that, because coal was a transportation intensive commodity, there was a "significant freight differential" between different Freight Rate Districts with respect to consumers, and that, because of this, "anyone with even a minimum amount of knowledge of the coal industry" knows that consumers in the Fulton-Peoria area, for example, cannot be sold coal from Southern Illinois on a competitive basis with coal mined in the Fulton-Peoria area. *Gallagher Dep.* 3, 100, 103-04.

345. The analysis of coal distribution patterns offered by defendants confirms that competition among coal mines is determined by location, transportation factors, and coal characteristics. It is not determined by political

boundaries or the geological unification of a coal bearing sequence of rock.*

IX. FREEMAN AND UEC HAVE LONG BEEN PREDOMINANTLY COMPLEMENTARY RATHER THAN COMPETITIVE PRODUCERS.

346. The evidence as a whole establishes that Freeman and UEC have long been predominantly complementary rather than competitive coal producers. *Steiner Dep. Ex.* 2, *paragraph* 12; *Steiner Tr.* 2225, 2228.

347. As is detailed below, the "common customers" of UEC and Freeman identified by the Government, *GX* 88-91, were shown to be multi-plant companies with no one facility able to be served competitively by both Freeman and UEC, or were shown to involve similarly non-competitive situations such as the shipment to a single plant of essentially different products.

348. With respect to Central Illinois Light Company (CILCO), for example, UEC shipped coal to facilities in Peoria which Freeman's mines—because of their freight disadvantage—could not serve competitively. Similarly, Freeman sold coal to CILCO's plant in Springfield which UEC's mines—again because of a freight disadvantage—could not reach competitively. As Mr. Morris put it, "We could reach Peoria from our Cuba-Buckheart Mines, and they could not. They could reach Springfield and we could not." *Morris Tr.* 206-07. Mr. Nugent explained that "the coal from the Crown Mine to the Springfield Plant of Central Illinois Light Company was supplied by truck. The freight rate from the Crown Mine or Springfield area to the Peoria market would not be competitive." *Nugent Tr.* 1924. The non-competitive nature of these shipments was confirmed by the president of CILCO during his testimony at trial. *Davis Tr.* 692-93, 702-04.

349. Caterpillar Tractor Company, Illinois Power Company, and Marquette Cement Manufacturing Company were also shown to be companies with multi-plant opera-

* See GF § VI B, ¶ 6 at p. 19.

tions receiving coal from UEC at one location and from Freeman at another, with no competitive overlap. *Morris Tr.* 206-07, 215-19; *Nugent Tr.* 1923, 1925; *DX* 76; *DX* 230. As the Chairman of the Board of Illinois Power Company explained, "Because of the location of United Electric and Freeman mines as related to the generating stations of Illinois Power Company we had not regarded the two companies as competitors with respect to serving any particular station. Freight costs prevented such competition." *DX* 230.

350. Freeman's shipments to Dairyland Power Cooperative, Foote Minerals, Union Electric Company, and Central Illinois Public Service Company's Meredosia station were of the by-product dust, whereas UEC's shipments were screenings. *Morris Tr.* 208-09, 211-12, 214-15; *Morris Dep.* 300; *Nugent Tr.* 1924-25; *Moser Tr.* 1513-14; *Tomey Tr.* 330-32; *Tarzy Dep.* 223-30; *DX* 231.

351. Dust is a resultant product which occurs during the preparation of metallurgical coal. In the past it was thrown away on "gob piles" at the mines. In more recent years, however, special equipment for the handling and burning of dust has been developed and installed at certain generating facilities which permits the use by them of limited amounts of dust along with regular coal screenings as boiler fuels. *Morris Tr.* 208, 568-69; *Nugent Tr.* 1850-53; *Tarzy Dep.* 223-24; *Tomey Tr.* 331; *Moser Tr.* 1513-14.

352. As the responses to the Subpoena Questionnaire demonstrate, dust is produced almost exclusively * by those mines, including Freeman's, in the Southern Illinois Freight Rate District, where high quality metallurgical coal is located. *DX* 51, *Set P-2C, Report* 3; *DX* 54. UEC has no reserves suitable for metallurgical use and has not and could not produce dust. *Morris Tr.* 209-10, 480.

353. Dust is sold at a price under its cost of production. Since the alternative is to throw the dust away,

* A small amount of dust occurs at those few mines which continue to prepare high quality domestic grade coal for what little remains of the home heating market. *Morris Tr.* 209-10; *DX* 51, *Set P-2C, Report* 3.

however, and since its sale offsets mining costs which are incurred in any event, realization from the sale of dust contributes to overall profitability. *Nugent Tr.* 1851-52; *Morris Tr.* 208. Because dust is merely an offal which results during the preparation of metallurgical coal, its availability is, of course, tied to and limited by the demand for metallurgical coal. *Tomey Tr.* 331-32; *Nugent Tr.* 1850.

354. Once a facility has installed special equipment for the handling and burning of dust, competition for the dust portion of its requirements is limited to those Southern Illinois mines which produce dust. Competition for the balance of its business occurs among those producers whose mines are located in that Freight Rate District enjoying a freight advantage with respect to the facilities in question. In light of this, it is clear that the shipments of UEC screenings and Freeman dust to common customers were in fact complementary rather than competitive transactions. *Tomey Tr.* 331-32; *Morris Tr.* 208-12, 214-15; *Nugent Tr.* 1924-25; *Moser Tr.* 1510, 1513-14. As an executive from Union Electric Company explained it:

> "Well, the dust is a byproduct of the metallurgical field, and there is only a limited amount of that available, and we have been able to utilize that in our boilers due to the economics of the situation, and we can only use about 50 percent of it, however, in our boilers and we have to mix it with the screenings. So, you are really not talking about two competitive situations here. One is on the screenings and one is on the dust." *Tomey Tr.* 331.

355. Two other of the Government's "common customer" examples were shown to be situations where UEC had no competitive status at all. Thus, in the case of TVA, permission was received to ship coal from UEC's Fidelity mine in fulfillment of Freeman's contract with TVA during certain periods of the year when adverse river conditions foreclosed the Fidelity mine from its natural markets. The UEC coal was sold below cost and was justified solely as a short term proposition which,

by keeping the Fidelity mine running, would reduce fixed capital costs. UEC alone could not have committed itself to TVA competitively on a long term or even on a yearly basis. *Hill Tr.* 1084-88; *Morris Tr.* 211; *Nugent Tr.* 1925; *Nugent Dep.* 233-34; *Tarzy Dep.* 79-81; *Folsom Tr.* 2485; *DX* 103-04.

356. Wisconsin Public Service Company also did not purchase directly from UEC. Because of the design of the utility's boiler equipment, UEC, standing alone, would not have been able to supply the company's fuel requirements. The UEC shipments were undertaken solely becasue Freeman had trouble fulfilling its contractual obligation. UEC's coal had to be mixed with Freeman's coal at a dock in Chicago before shipment to the utility in order to meet the coal specifications required. *Morris Tr.* 212-13; *Nugent Tr.* 1925. During his deposition, the Superintendent of Steam Plants of Wisconsin Public Service Company, Mr. Morrison, confirmed that UEC, independently, would not even be considered as a potential supplier by his company.* *Morrison Dep.* 19.

357. Only one of the "common customer" examples cited by the Government appears to have involved a situation where the coal shipments by UEC and Freeman, had the two companies been independent, might have been competitive: sales to Commonwealth Edison Company. The competitive situation with respect to Edison's future coal requirements has been dramatically altered, however, by recent air pollution concern and regulation. Because of its low sulphur coal program,

---

* The balance of the "common customer" shipments, apart from those to Commonwealth Edison, were shown to be similarly non-competitive. UEC's shipments to Inland Steel Company were of steam coal for the generation of electricity, while Freeman's shipments were of metallurgical coal from making steel; Freeman's shipments to Illinois Power Company's Vermillion plant did not overlap UEC's shipments at all, but merely represented the fulfillment of UEC's contractual obligation upon the exhaustion of reserves at UEC's Mary Moore mine located fifteen miles from the facility in question; and the Freeman coal consumed at the Grand Tower generating station of Central Illinois Public Service Company proved to be dust. *Morris Tr.* 208, 215-19; *Nugent Tr.* 1925; *Camicia Tr.* 1424-25; *Morris Dep.* 301; *DX* 231.

Edison has already begun "phasing out" high sulphur coal producers such as United Electric so that, in the present competitive situation, such producers are no longer the "principal competitors" for or "major suppliers" of its coal requirements. This factor, as well as UEC's lack of reserves, has foreclosed UEC from the Edison market. Mr. Gordon Corey, Chairman of Edison's Finance Committee, specifically pointed out that "the United Electric contract expires this year and has not been renewed." *Corey Tr.* 1658-59.

358. In any event, UEC and Freeman's sales to Edison in the past have to be considered in light of Edison's substantial coal requirements. Because Edison was required to purchase coal from several Freight Rate Districts in order to fulfill its needs, the competition which a given mine had to meet in bidding for Edison's business was that of the other mines within its Freight Rate District which were also bidding for Edison's business rather than that of mines in other Freight Rate Districts. *Nugent Dep.* 251; *Tarzy Dep.* 239, 244-45; *Camicia Dep.* 126-27.

359. Even if, contrary to the evidence, an independent United Electric would be able to compete with Freeman for the future business of Commonwealth Edison, it belies common sense to conclude that the UEC-Freeman combination could have or might have any adverse effect on Commonwealth Edison. Edison's $2.5 billion in assets, magnitude of coal purchases,* commitment to nuclear energy, readiness to use alternative fuels and ownership of its own coal reserves and uranium resources make it totally improbable that Edison would be so affected. The candid and unchallenged testimony of one of Edison's top officials at trial makes this clear—even if the Government is correct in asserting that Commonwealth Edison does not take "unfair advantage" of midwestern coal producers. *Corey Tr.* 1611-13; *GF § VI, ¶ C(9) at p.* 25; *see also Findings* 297-302, 310.

* 1967 sales to Commonwealth Edison accounted for about a third of UEC production. Commonwealth Edison purchases from UEC represented only a tenth of its overall coal requirements. *Admitted by plaintiff, DPTF* 93.

360. Apart from shipments to Commonwealth Edison, however, and as discussed in Findings 314 through 341, UEC's mines are located in Freight Rate Districts which sell to different markets from those served by the Freight Rate Districts where Freeman's mines are located. This confirms that the UEC and Freeman combination is predominantly complementary rather than competitive.*

X. THE GOVERNMENT'S CASE IS BASED UPON MISCONCEPTIONS OF THE REALITIES OF THE COAL INDUSTRY

A. *INTERFUEL COMPETITION CANNOT BE IGNORED*

361. On the basis of all the evidence, it is clear that the likely competitive effect of the UEC-Freeman combination must be determined within the context of energy sources used to produce electricity, space heating and process heat, including the boiler fuels coal, gas, oil, nuclear energy, as well as pumped storage, hydropower, and other technologically emerging sources of energy. *See Findings* 138-51, 166, 192-282.

362. The Government's request that the Court ignore the reality of interfuel competition, and assess the probable competitive effects of the combination solely with reference to coal, is bottomed on its contention that in the midwest "coal has had little competition from other fuels." *Government Brief, p.* 71. This contention finds no support in the record. On the contrary, as the situation was summed up by the Government's own economist:

> "The customers in this case all—all the utility customers indicated that they consider all sources of fuel.
>
> * * * *

---

* The Government's contention that this finding is inconsistent with Freeman's ability to provide "backup reserves" for United Electric was descredited at trial. *Nugent Tr.* 1975-76. *See Finding* 445.

"They did not say that they considered the primary competition coal with reference to future facilities, certainly.

* * * *

"They also said they would consider all things, and then make a decision." *Folsom Tr.* 2564-65.

363. The evidence demonstrates that suppliers of alternate fuels offer UEC and Freeman at least as much competition as do coal producers. Their customers consider all sources of fuel, not just coal. *See Findings* 192-282. Accordingly, the likely effect of the UEC-Freeman combination on competition cannot be accurately measured without recognizing that the level of that competition is governed largely by interfuel rivalry. Thus, whether it is all energy sources for the uses mentioned, or only coal, that is chosen as the relevant product market, the vigorous competition which coal faces from other fuels must be considered.

B. *DISTRIBUTION PATTERNS OF COAL ARE NOT DETERMINED BY ARTIFICIAL CONSIDERATIONS*

364. The expert economists of both the Government and the defendants emphasized that choosing the proper geographic markets within which to test the competitive implications of the UEC-Freeman affiliation was not a "counsel of perfection," but rather involved determining which of the possible approaches to defining such markets made the most economic sense. *Folsom Tr.* 2537; *Steiner Tr.* 2141-42.

365. An analysis of midwest coal distribution patterns based on all the evidence—including comprehensive questionnaires forwarded to midwest coal producers and consumers under subpoena issued by the Court—shows that

---

* Mr. Folsom had testified similarly during his direct examination that "virtually every utility official who testified either through deposition or from the stand, during the hearings on this matter, indicated that they have considered all fuels in making a decision as to which one was the most appropriate:" *Folsom Tr.* 2466.

the markets within which midwest coal producers are able to compete are determined by the ICC-designated Freight Rate Districts within which their mines are located. *See Findings* 283-345.

366. The most appropriate geographic markets within which to assess the probable competitive effects of the UEC-Freeman combination are the sales areas able to be served by mines in the Freight Rate Districts where the mines of UEC and Freeman are located. *See Findings* 309-45. The only fault which the Government's economist could find with such an approach was that, in following it, defendants had considered separately the facilities of Commonwealth Edison Company and consumers located in the Greater Chicago Air Quality Control region. *Folsom Tr.* 2467-68. However, the evidence shows that there are sound economic reasons which warrant the separate consideration of these markets. *See Findings* 310-11.

367. The approach the Government urges is that Illinois and what they refer to as the Eastern Interior Coal Province Sales Area, should be used to provide the geographic context with reference to which the likely competitive effects of the merger should be determined. *See GF § VI A, B at pp.* 14-23. The record, however, offers no support for such an approach.

368. There is no Eastern Interior Coal Province Sales Area coal market. On three separate occasions—on direct examination, under cross-examination and when questioned by the Court—the Government's economist confessed that he had "problems" with the Government's suggestion of such a market, principally because of its failure to take account of the important role which transportation costs play in determining where coal from any given mine can be sold. Furthermore, Mr. Folsom could offer no explanation as to why certain areas had been included within the defined area or why certain others had been excluded. *Folsom Tr.* 2469-70, 2536, 2608-09; *compare Steiner Tr.* 2138, 2155, 2157-59, 2223.

369. The only testimony that the Government's economist could offer in support of such a market was, in answer to a hypothetical question, the speculation that there was a "possibility" that the price of coal in one

midwest state acted as a restraint on the price of coal in other midwest states. *Folsom Tr.* 2471. On cross-examination, however, he conceded that he knew of no record evidence which supported his speculation, and the evidence is to the contrary. *Compare Folsom Tr.* 2593-94 *with Schotters Dep.* 34; *Nicosia Dep.* 70-71; *Hill Tr.* 1131; *Gaunt Dep.* 6-7; *Ward Dep.* 12-13, 27; *Beck Dep.* 6-7; *Morrison Dep.* 18-19; *Nugent Dep.* 224, 228.

370. Similarly, there is no Illinois coal market. The Government's economist not only conceded that, in general, state boundaries are not a good determinant of a market, but admitted that he knew of no factor that made the state boundaries of Illinois a meaningful measure of the relevant geographic market for coal. *Folsom Tr.* 2500-01.

371. The Government's economist also stressed that you have to have the testimony from the people about the fact that they buy coal all over an area before you can justify saying it is an economic market. *Folsom Tr.* 2608. Here, however, not a single industry witness—either consumer or producer—testified to the existence of an Illinois market for coal. Even the economist from the U.S. Bureau of Mines, who prepared the Illinois data on which the Government relies, recognized that the market areas in which coal could be sold were determined by Freight Rate Districts and not by state boundaries. *See Finding* 344. When confronted with this testimony, the Government's rebuttal economist stated as follows:

> "I don't recall at this time his testimony.
>
> "I would certainly think it fair to say I did not weigh heavily what he said about coal markets." *Folsom Tr.* 2592.

372. Use of Illinois as a market is particularly inappropriate in this proceeding. All but one of Freeman's mines are located in the Southern Illinois Freight Rate District, and the evidence shows that approximately 70 percent of the coal produced by Freeman's Southern Illinois mines is shipped to states other than Illinois. Moreover, less than 38 percent of Freeman's total 1967 production not sold to Commonwealth Edison was shipped to

consumers in Illinois. *Freeman Response to Government Questionnaire.*

378. Regardless what geographic boundaries are chosen for the relevant market, however, it is essential to any meaningful analysis of, and conclusions concerning, the likely competitive consequences of the challenged combination that full account be taken of the important role which the factors of transportation and coal quality characteristics play in determining where coal from the mines of UEC and Freeman can be sold. Even if the Government's suggested markets of the "Eastern Interior Coal Province Sales Area" and Illinois were accepted, for example, it would still be necessary to recognize that UEC and Freeman serve essentially different areas and customer facilities within the "Eastern Interior Coal Province Sales Area" and Illinois and that the companies have long been predominantly complementary rather than competitive coal producers. *See Findings* 283-360.

C. *THE GOVERNMENT'S STATISTICS ARE MISLEADING*

Production Figures Are an Inadequate and Inaccurate Measure of Market Strength

374. All of the Government's rankings of what it labels "leading" midwest and Illinois coal producers are based solely on statistical data relating to past coal production. *GX* 62-86. The evidence makes it clear, however, that the competitive strength of a coal producing company today is not measured by its past or current production, but by the extent to which it has the coal reserves necessary to compete in the market for long-term utility contracts. *See Findings* 88, 126-29, 173-78, 386-90.

375. The inadequacy of using production, rather than reserve statistics, as a measure of market strength is illustrated by the total absence of Humble Oil and Refining Company from any of the Government's rankings. While Humble is not scheduled to bring its Carlinville mine on stream until next year, the company has huge reserve holdings which have made it a most significant

competitive factor for several years. *Shipley Stip.* 1-5; *DX* 61; *Corey Tr.* 1599-1600, 1666.

376. Conversely, Little Dog Coal Company, according to the Government a "leading" producer in 1967, abandoned operations the following year. *Compare GX* 72 *with Beck Dep. Ex.* 1. The Government offered no explanation as to what happened to its "leading" producers Mid-Continent Coal Corporation, Lumaghi Coal Company, Saxon Coal Corporation, Young's Coal Corporation, Crab Orchard Cooperative Coal Company, J. W. Coal Company, Big Muddy Coal Company, Ajax Coal Company, Jo-Lor Mining Company, or Snow Hill Coal Corporation (all of which apparently abandoned operations)—other than to show that they were not acquired by other midwest coal producers. *Compare GX* 87 *with GX* 62-86, *DX* 46.

377. In connection with this proceeding, midwest coal producers supplied extensive information with respect to their holdings of coal reserves in Illinois, Indiana and West Kentucky. Significantly, this information shows that UEC's reserves amount to less than one percent of the total midwest reserve holdings of these producers.* Freeman and UEC together hold less than five percent of these midwest reserves. *DX* 61.

The Inadequacy of Production Figures as a Measure of Market Strength Is Compounded by Grouping Them in Unrealistic Markets

378. The Government's production statistics are also misleading in view of the fact that they combine production data from many mines which, because of the factors of transportation and coal quality characteristics, do not, and can not, compete with each other. As Professor Steiner observed at trial:

> "I do not believe production shares, market shares, concentration ratios make sense at all, or have any

* As is detailed in Findings 389, 391-97, 428-30, most of these reserves are not commercially recoverable by UEC, and, of those that are, all but four milion tons have already committed on long-term contracts.

genuine indication of the degree of competition unless they are measured in a meaningful economic market. I think that without a market one does not have the basis of using these statistics.

* * * *

"I don't believe you just draw circles on a map and say that is a market." *Steiner Tr.* 2160.

379. The Government's production statistics are also misleading because they lump together production of steam coal and metallurgical coal, which, as the Government admits, are not competing products. *DX* 46. Significantly, only one partner to the combination being challenged (Freeman) can produce both. *Steiner Tr.* 2138; *see also Findings* 64, 78, 352.

380. Finally, the Government's production statistics are an inadequate and inaccurate measure of market strength in view of their failure to reflect interfuel competition and the competitive pressure which it places upon coal producers. *Steiner Tr.* 2138.

The Government's Statistics Show No Real Concentration Trend

381. The one thing which the Government's statistics do show, however, is that there has been no real trend toward concentration in midwest coal production. There were decreases, for example, of more than ten percent and five percent in the UEC-Freeman combination's percentage of total coal produced in the midwest and Illinois, respectively, between 1960—the year following the restructuring of UEC's Board and management in order to reflect the affiliation—and 1967, the last year for which there is record evidence. Furthermore, apart from Peabody Coal Company, the share of production accounted for by the two, four, and ten largest producers in both Illinois and the midwest has either remained relatively stable or, in some cases, declined.* *GX* 64, 72, 77, 85; *DX* 237; *Steiner Tr.* 2230-43.

---

* The 1970's will see further deconcentration in midwest coal production as Humble Oil opens a mine with an output of 3,000,000 tons per year and Peabody divests itself of an operation annually producing 6,000,000 tons. *See Findings* 245-425.

382. The competitive implications of the growth in the share of midwest coal production accounted for by Peabody Coal Company have presumably been considered and dealt with to the satisfaction of the Government in the consent decree entered in *United States* v. *Peabody Coal Company*. *DX* 84.

383. The lack of any true industry-wide trend toward concentration over the past decade is particularly significant when consideration is given to the fact that the production of the small mines that have withdrawn from the industry has not been transferred to larger producers, but rather has disappeared with the decline and end of the home heating and railroad markets which these small producers served. *Steiner Tr.* 2240-41.

384. Both the defendants' and the Government's economic experts agreed that it is the disappearance of domestic and railroad markets, coupled with the rise of long-term contracts involving substantial quantities of coal and the employment of mass transportation methods, that is responsible for and explains the withdrawal of many small producers from the coal industry. *Steiner Tr.* 2127, 2240-41; *Folsom Tr.* 2581; *see also Findings* 159-64, 182-84.

385. Even those smaller producers who continue in operation are, as they recognize, in an essentially different business from large-scale producers competing for the long term business of utility consumers. *See Finding* 162. Consumers recognize that, since such small producers lack the reserves and capacity necessary to bid on long-term contracts, it would be of no benefit to have them soliciting their business. Thus, when asked by Government counsel whether it was a benefit to his company to have a number of coal suppliers soliciting its business, one utility executive responded as follows:

> "It's a definite benefit to have a number of sound, reliable suppliers, yes. There is not distinct benefit in having a great number of suppliers, but to have the type that give us the foundation for a sound fuel program, yes." *Wood Tr.* 659-60; *see also Steele Tr.* 938-39; *Tomey Tr.* 333-38; *Davis Tr.* 694-95, 764; *Schotters Dep.* 11-12; *Nicosia Dep.* 37-38.

XI. THE EFFECT OF THE COMMON OWNERSHIP OF UNITED ELECTRIC AND FREEMAN HAS NOT BEEN, AND WILL NOT BE, SUBSTANTIALLY TO LESSEN COMPETITION IN ANY LINE OF COMMERCE IN ANY SECTION OF THE COUNTRY

A. UEC DOES NOT HAVE THE UNCOMMITTED RESERVES WHICH A COAL COMPANY REQUIRES IN ORDER TO COMPETE.

386. Current production figures do not provide an adequate measure of a coal producer's market strength. The critical determinant of whether a coal company can offer effective competition as a coal supplier is the level of uncommitted coal reserves under its control. Current production statistics reflect only past commitments of coal reserves, and these cannot be sold a second time. In the utility market, where supply assurance is required, long term contracts cannot be obtained without the existence of verifiable, substantial and uncommitted reserves within the coal producer's control. *DX* 86, *p.* 8; *Steiner Dep. Ex.* 2, *paragraph* 6; *Steiner Dep.* 191, 283, 364-68; *Steiner Tr.* 2140-41, 2247-48, 2437.

387. The testimony of coal consumers confirmed that a coal producer must have ample uncommitted reserves in order to compete for their business. As one utility executive explained: "In the long-range competitive picture, one of the big things is to assure ourselves of the proper reserve situation. We don't go into contracts with [a coal producer] or consider them competitive . . . unless they have the reserve to back it up, and we can count on them down the road." *Wood Tr.* 609, 672, 678; *Corey Tr.* 1611-12; *Davis Tr.* 729, 756-57; *Tomey Tr.* 335-37; *Steele Tr.* 942, 969; *Moser Tr.* 1521; *Schotters Dep.* 12; *DX* 77.

388. Similarly, defendants' expert economist, Professor Steiner, characterized reserves as the "life blood" of a coal company, and observed that even "if it turned out that one company had 50 percent of this year's production" but had "no reserves other than those committed

on long-term contracts, I would think that company would not be an important factor in future competition." *Steiner Dep.* 191, 292. "The reserve position is important in the sense that a company, in order to be an effective force, must have sufficient reserves to credibly bid on contracts demanding large quantities of coal." *Steiner Tr.* 2248; *see also Steiner Tr.* 2251, 2288; *Steiner Dep.* 187, 259-60, 262-64, 281-287, 304-05; *Nugent Tr.* 1849-50, 1931-33; *Sherwood Tr.* 1450-51; *Ward Dep., pp.* 13-14, 59-60.

389. Of the approximately 56,000,000 tons of economically recoverable coal reserves at UEC's existing mines, all but approximately 4,000,000 tons—an amount equal to about nine months' production by UEC at present levels—have been committed to long-term contracts already entered into by UEC. *DX* 63.

390. The government's own economist, Mr. Folsom, conceded that, absent a merger, if UEC could not acquire additional strip reserves or undertake deep mining, the company's only alternative would be to "mine themselves out of business," and recognized that "UEC is not going to be in that situation a viable competitive force in this market." *Folsom Tr.* 2476, 2584.

B. UEC'S STRIP RESERVES AT THE INDUSTRY FIELD AND OTHER SCATTERED MIDWEST STRIP RESERVE HOLDINGS HAVE NO COMPETITIVE PROMISE.

The Industry Field

391. Some time prior to 1948, UEC began to acquire strip reserves in the so-called Industry Field, south of the town of Industry near the border of McDonough and Schuyler counties in Illinois. Presently, its holdings in the Industry Field consist of some twelve and one-half million tons of strip reserves. *Finding 79(B); Weir Dep. Ex.* 5; *Nugent Dep. Ex.* 38. On all the evidence, it is clear that the Industry Field is not now, nor is it likely to become, economically mineable. *DX* 87, *p.* 4; *Weir Dep.* 60; *Nugent Tr.* 1946; *Nugent Dep.* 377; *Morris Dep.* 308-09; *Latimer Dep.* 428; *DX* 24.

392. UEC personnel familiar with the Industry Field testified at length to the many reasons which make it unlikely that these reserves can be recovered on a commercially favorable basis within the foreseeable future: the thinness of the seam, the high overburden ratio, the presence of unfavorable mining conditions, the field's distance to transportation arteries, the lack of a sufficient quantity of mineable reserves to justify the capital expenditure required to open a new mine, and the life. Moreover, in view of current air pollution control regulations, the high sulphur content of the coal in the field would be an additional disadvantage. *Nugent Tr.* 1945, 1983-85; *Morris Dep.* 150, 153-54, 172, 308-09, 312-14; *Nugent Dep.* 338-39, 342, 377; *Tarzy Dep.* 128-30, 135, 142, 170-71; *Latimer Dep.* 428; *DX* 12, *p.* 5; *DX* 24; *DX* 113, *pp.* 4023, 4253. As Mr. Nugent summed up the situation with respect to the Industry Field at trial:

> "There was a time in the early part of 1960 when I suggested that land be acquired [at the Industry Field] at farm prices, that I felt perhaps this coal might be mined after all of the coal in the Fulton County is exhausted, and that could be some 20 years hence. . . . With the further development of nuclear energy, my present thinking is that the company had better take its licking now and dispose of the land, at farm prices if need be." *Nugent Tr.* 1946.

393. Consumers with whom UEC had discussed the Industry Field recognized its lack of competitive promise, and past efforts by UEC to interest midwest utilities in coal from the Industry Field met with no success. *Davis Tr.* 727; *Morris Dep.* 172-73; *see also Moser Tr.* 1564-65; *Wood Tr.* 657-58, 680.

394. Similarly, an official from the coal producer which operates that coal mine closest to UEC's reserves in the Industry Field, testified that his company's mine was a marginal operation when operating in overburden ratios comparable to those in the Industry Field, and pointed out numerous factors which made it even less likely that UEC's Industry reserves could be mined profitably. *Hopper Tr.* 1876-78, 1895-1901.

395. An evaluation by the mining engineering firm of Paul Weir Company confirms the "distinctly marginal" nature of the Industry reserves and the fact that they would not be competitive in the foreseeable future with reserves now being mined or held for future operation elsewhere within Illinois, Indiana or West Kentucky. *DX* 87, *p.* 4. Mr. Weir testified during his deposition that "I don't think that these reserves will ever be mined, in any circumstances." *Weir Dep.* 60; *see also Weir Dep.* 52, 58-62, 69-70; *DX* 87, *pp.* 2-4.

396. So convincing is the evidence that the reserves at UEC's Industry Field hold no competitive promise that, even before the trial began, Government counsel indicated to the Court that they were "inclined to agree" with the defendants' representation that "as of today they are not commercially valuable." *Pre-trial Conference, October* 3, 1969, *Tr.* 23.

Other Miscellaneous Midwest Strip Reserves

397. The only other midwest strip reserves controlled by UEC are two isolated tracts in Fulton (344,842 tons) and Perry (1,714,710 tons) Counties in Illinois. These have been owned since before July 31, 1958. *Finding* 78 *(D); DX* 60*A*, 60*B*. These reserves are not of sufficient size to support the opening of a mine at these locations. *Latimer Tr.* 1041; *Tomey Tr.* 337; *Schotters Dep.* 11-12; *Organ Dep.* 111; *DX* 87, *Table* 3.

C. COMMERCIALLY RECOVERABLE STRIP RESERVES IN THE MIDWEST ARE NOT AVAILABLE FOR ACQUISITION.

398. As is detailed in the Findings below, the evidence supplied by geologists, mining engineers, officials of UEC and Freeman, other producers and energy consumers establishes beyond question that commercially recoverable midwest strip reserves are not available for acquisition which would enable UEC to continue operations beyond the exhaustion of reserves at its present mines.*

* UEC's diligent but unsuccessful efforts to acquire additional economically mineable strip reserves in the past are discussed in Findings 92-99.

399. The report prepared by Mr. Organ, defendants' expert geologist, concludes that "by 1960, there was no longer any possibility of acquiring or establishing, for transfer to coal producers, of any new economically mineable strip coal acreage in the Illinois basin of sufficient size to justify the opening of new mines." The report states that, on the contrary, "such economically mineable strip reserves as exist within the Illinois basin are under the control of existing producers, and that such other strip reserve acreage that has not been acquired holds no competitive promise." *DX* 88.*

400. Similarly, the Principal Geologist of the Illinois State Geological Survey stated that "so intense has been the interest in the more favorably situated strippable reserves, that I do not know of any prime acreage that is not now under control." *DX* 34; *see also Kolbe Dep. Ex. O, p.* 3 .

401. These intense efforts to build up substantial inventories of strip reserves, and the vast quantities resultingly controlled by other coal producers, are a reflection of the scarcity of such reserves. If economically mineable strip reserves were readily available, producers would be unwilling, and there would be no necessity, to invest substantial sums of money to tie up coal fields for the future. *DX* 61, 62; *Steiner Dep.* 366-67.

402. The report prepared by Paul Weir Company, mining engineers retained as experts by defendants, observes that the Denmark field of strip reserves being developed by Ayrshire Collieries is "the last undeveloped major reserve of strippable coal in the Tri-State Area and we doubt that any new comparable strip operations can be developed in the Tri-State Area." The report expresses the belief that "peak production in strip coal will be reached within a very short time and a gradual decline will ensue thereafter," and notes, in this regard, that "coal producers in Illinois, Indiana, and West Kentucky have been faced for some time with a deteriorating strip reserve position," and that "despite diligent search,

* During his deposition, Mr. Organ defined the Illinois basin as "that coal basin which lies wholly within Illinois, Indiana and West Kentucky." *Organ Dep.* 113.

operators have been unable to find economically strippable reserves not now controlled by others." *DX* 87, *pp.* 22-24, 27-28; *see also Weir Dep.* 67, 131-32; *DX* 87, *pp.* 17-28 *and attached letter.*

403. As of July, 1969, in the opinion of Paul Weir Company, mining engineers, there are not available in Illinois for purchase from non-operating owners a sufficient number of adjoining tracts that when assembled would amount to strippable coal reserves over 10 million tons. *Admitted by plaintiff, DPTF* 119. This opinion was reconfirmed by Paul Weir Company in its expert report. *DX* 87, *p.* 28 *and attached letter, p.* 3.

404. The unavailability of additional midwest strip reserves was recognized by other coal producers. Under questioning by Government counsel, Mr. Organ, defendants' expert geologist, related numerous conversations he had had with other coal executives with respect to the unavailability of strip reserves. *Organ Dep.* 115-20. The chief executive of one coal producer told him that his company had "turned heaven and earth trying to find" strip reserves but had met with no success. *Organ Dep.* 119. As Mr. Nugent testified during his deposition, the unavailability of strip reserves is known by virtually everyone in the coal business—"down to cub engineers who have just been in the business a couple of years." *Nugent Dep.* 393.

405. The unavailability of commercially recoverable midwest strip reserves is also confirmed by the unsuccessful efforts to acquire such reserves by Amalgamated Industries and by Humble Oil and Refining Company, a subsidiary of Standard Oil Company (New Jersey). The investigation for such reserves by Amalgamated "indicated that there were no significant strip reserves available in Illinois other than those owned by coal companies." *Dorrance Dep.* 11.

406. Similarly, none of the several hundred thousand acres of coal lands acquired in Illinois by subsidiaries of Standard Oil Company (New Jersey) are suitable for strip mining. Humble was looking for coal reserves in blocks of a minimum of approximately 100,000,000 tons each for future development of hydrocarbon raw ma-

terials. Upon investigation, Standard concluded that strippable coal reserves were not available in blocks of a minimum of approximately 100,000,000 tons. *Admitted by plaintiff, DPTF* 118.

407. Consumers were also familiar with scarcity of commercially recoverable strip reserves in the midwest. *Schotters Dep.* 39-40; *Dorrance Dep.* 11. As Mr. Nugent summed up the situation: "There is not a utility man in the state buying coal, a knowledgeable utility man, who does not know that strip reserves are not available." *Nugent Dep.* 393.

408. UEC's executive personnel were examined at length both during deposition and at trial concerning the availability to UEC of additional midwest strip reserves. The testimony was uniform that "there are not any available." *Camicia Dep.* 191; *Morris Tr.* 431-32; *Ames Tr.* 1709; *Thorsen Tr.* 586-87; *Camicia Tr.* 1439-41; *Nugent Dep.* 375-78, 389-94; *Inman Dep.* 134, 160.

409. It is particularly significant that the two witnesses whom the Government hoped would support its position that additional midwest strip reserves were readily available for acquisition by UEC failed to do so. Thus, Mr. Simon of the Illinois State Geological Survey testified that, by itself, his Department's reserve estimates "certainly couldn't be used to support" the Government's contention that UEC will be able to acquire additional economically mineable strip reserves in Illinois to continue its mining operations beyond the time its existing strip reserves are exhausted. *Simon Tr.* 62-63; *see also Camicia Tr.* 205.

410. Government witness Hopper of Ayrshire Collieries recognized that "it is common knowledge within the coal industry that strip reserves available for acquisition are in extremely short supply and that if there were known economically recoverable reserves there would be an eager scramble for them." *Hopper Tr.* 1892.

411. In the end, even the Government's own economist was forced to concede that the "record indicates that high quality strip reserves are relatively scarce in Illinois. *Folsom Tr.* 2476; *see also Steiner Dep.* 258-59, 305-06.

D. STANDING ALONE, UEC WOULD BE UNABLE SUCCESSFULLY TO UNDERTAKE DEEP MINING.

412. In view of the unavailability of commercially recoverable midwest strip reserves, UEC's only hope for remaining a viable competitive force would be if it could successfully undertake the deep mining of coal. *Folsom Tr.* 2476, 2584; *see Finding* 390. As is detailed below, the evidence establishes that there is no prospect that UEC—absent Freeman—could successfully enter into deep mining.

UEC's Strip Mining Experience Would Be of No Benefit.

413. Since at least 1930, and continuing to date, UEC has had neither the equipment, personnel nor expertise required for successful entry into deep mining. *Morris Dep.* 77, 194-197, 218; *Morris Tr.* 159; *Camicia Tr.* 1392; *Camicia Dep.* 194; *Inman Dep.* 14-15, 29, 158, 171-174; *Tarzy Dep.* 110; *Ames Tr.* 1698, 1708; *Thorsen Tr.* 588, 892. As one of the company's executives expressed it, "We were strictly a strip mining company." *Tarzy Dep.* 110; *see also Findings* 100-15.

414. UEC's experience as a strip miner would be of no assistance to it in attempting to undertake deep mining operations. *DX* 87, *pp.* 28-30; *Camicia Tr.* 1392-93. As one knowledgeable industry witness put it, compared to strip mining, deep mining "is just a different ball game, a different business altogether." *Camicia Tr.* 1391.

415. Deep mining requires far more expertise than, and expertise quite different and distinct from, that required for strip mining. Apart from the marketing and sale of coal, there is virtually no phase of the expertise acquired in strip mining that could be carried over into deep mining; there is no correlation between the engineering, management, knowhow or knowledge of mining. *DX* 87, *p.* 29; *Camicia Tr.* 1392.

416. There is, moreover, a crucial and critical shortage of miners, supervisors and technically trained people with an expertise in deep mining. *DX* 87, *pp.* 28-29; *Camicia Tr.* 1394.

417. In comparison to strip mining, deep mining is vastly more complex, poses totally different engineering problems and involves working conditions of an entirely different nature.* Strip mining is in many ways analogous to earth moving. *DX 87, p. 29; Camicia Tr.* 1392. Deep mining, however, is a very difficult and highly technical operation. The successful opening of a deep mine requires expert knowledge and knowhow regarding a host of complex technical matters such as seam exploration, shaft and hoist construction, drilling and fore-drilling of the seam, underground roof conditions and maintenance, gas emission, drainage, ventilation, extraction methods, machinery, and equipment and mine safety. *Camicia Tr.* 1389-90; *Gaunt Dep.* 25.

418. Because of these complexities, deep mining entails substantially more risk than strip mining. Bad judgment with respect to any one of the factors involved in deep mining could well lead to the failure of the entire mine. *DX 87, p. 29; Camicia Tr.* 1391.

419. In light of the complexities, difficulties and risks which deep mining entails, it is doubtful that a utility company or any other large buyer of coal would be willing to enter into a contract with a company with no experience in that field and one without a staff, when coal is available and underground mines can be opened up by producers that are in the business and competently staffed and with adequate capital and reserves. *Nugent Dep.* 431.

420. This was confirmed by the testimony of consumers. The president of one midwest utility, for example, testified that, since "we always have felt or thought of United Electric as a strip mine company, not having any prior experience with deep mining, I would say that we would be hesitant about entering any commitment

---

* With regard to the latter point, an experienced deep mining executive testified that deep mining required "a different type of person, even insofar as attitude." *Camicia Tr.* 1392. One UEC executive put it this way: "We are afraid. If you told me . . . that starting tomorrow you can't do what you are doing, we are going to send you down to train you to be the superintendent for an underground mine, I would say, 'Uh-uh, I'm on my way. Just get another boy.'" *Tarzy Dep.* 111.

for coal from an unknown source, so to speak." *Steele Tr.* 1000; *see also Moser Tr.* 1576; *Tomey Tr.* 340-42; *Gaunt Dep.* 25-26; *Abrahamson Dep.* 27; *Sloane Dep.* 24-25; *Morris Dep.* 271.

An Independent UEC Would Not Likely Attempt Deep Mining.

421. Absent affiliation with an experienced deep mining coal producer such as Freeman, there is no reasonable probability that UEC could successfully undertake deep mining, and therefore no reasonable probability that it would try. *DX* 87, *pp.* 29-30; *Camicia Tr.* 1393; *Inman Dep.* 171; *Steiner Dep.* 259-60, 305-06; *Steiner Dep. Ex.* 2, *paragraph* 12.

422. Nicholas T. Camicia, President of Pittson Company, one of the world's largest deep mining coal producers, and a past president of both UEC and Freeman, testified at trial that, on the basis of his professional knowledge and expertise as a deep mining engineer and executive, as well as the familiarity with UEC's capabilities and personnel which he gained while serving as the company's president, he did not see how UEC could possibly make a successful entry into the deep mining of coal without an affiliation with a deep mining company. Mr. Camicia testified that, indeed, he did not "see how they could even make a start at it." *Camicia Tr.* 1393. It was his conclusion that UEC "certainly was not in a position to go into a deep mine venture," and that "they would be making a mistake if they had tried it." *Camcia Tr.* 1419, 1422.

423. Executives from other companies lacking deep mining expertise testified to the inability of their companies to undertake deep mining operations. *Sherwood Tr.* 1455, 1471, 1474; *Schotters Dep.* 13; *Nicosia Dep.* 88.

424. Significantly, there is no evidence that any company has even attempted to make a grass roots entry into deep mining coal operations in recent history in the midwest. Both Mr. Nugent and Mr. Camicia testified that they knew of none. *Nugent Dep.* 424; *Camicia Tr.* 1395. While the government suggested, in response to defendants' interrogatories, that Ayrshire Collieries

opened its Thunderbird mine under such circumstances, an executive from Ayrshire confirmed at trial that the Thunderbird mine was not opened until after Ayrshire had acquired two coal companies which operated deep mines. *Compare DX* 46 *with Hopper Tr.* 1869, 1878-79.

425. Humble Oil and Refining Company is a subsidiary of Standard Oil Company (New Jersey), the world's largest industrial corporation, having assets of more than $16 billion and an annual net income of well over $1 billion. Humble has begun construction recently of a deep coal mine in Illinois. However, as the Government pointed out during its successful challenge of Standard Oil's proposed acquisition of a company engaged in the deep mining of potash, there is no correlation between Standard Oil's ability to make a grass roots entry into deep mining and that of a smaller company attempting a similar venture. *Shipley Stip.* 1-5; *DX* 81-83; *see also United States v. Standard Oil Co. (New Jersey)*, 253 *F.Supp.* 196, 200, 208, 223, 227 (*N. Jersey* 1966). Moreover, as Mr. Camicia pointed out at trial, "the jury is still out" on the question whether Humble's efforts will be successful. *Camicia Tr.* 1424.

426. It would not be possible for UEC to enter into deep mining by acquiring a small deep mining company. Such companies do not have, because they do not require, a staff with the technical know-how for large scale deep mining. Underground operations of substantial scale are a prerequisite to the maintenance of such a staff. *Camicia Tr.* 1428-29. The president of one small deep mining company was asked whether someone with his experience and knowledge would be able to open a deep mine producing a million or two million tons a year. He responded, "Well, I couldn't, and I don't think anyone else could." *King Dep.* 19.

427. Even the Government's witness from Ayrshire Collieries, which had opened a deep mine after acquiring two deep mine companies, testified that the mine has lost money nine of the eleven years it has been operating, that it was so clear the mine would never be profitable that five million of Ayrshire's investment has already been written off, that Ayrshire would "absolutely not" have

undertaken the venture had they known what was in store, and that it was "entirely possible" that someone who had a greater amount of experience and expertise in deep mining would never even have opened the mine. *Hopper Tr.* 1878-81.

UEC's Deep Reserves Are Not Presently Mineable.

428. In any event, in order to remain a competitive factor, UEC—even if it had the requisite underground expertise—would need choice deep reserves which could be developed in the short term as the reserves at its present mines become exhausted. However, the only field of midwest deep reserves controlled by UEC, the so-called Round Prairie Field, could not be developed on a competitive basis within the near future.* *Nugent Dep.* 396-402; *Camicia Dep.* 41-43, 171-72, 175, 189; *Morris Dep.* 241, 244; *Camicia Tr.* 1400; *Hopper Tr.* 1873, 1886-88.

429. The Government's present assertion that UEC's reserves at Round Prairie "represent a valuable corporate asset" stands in sharp contrast to its pre-trial concession that "as of today they are not commercially valuable." Compare *Govt. Brief, p.* 137, *with Pre-trial Conference, October* 3, 1969, *Tr.* 23.

430. The isolated patches of deep coal controlled by UEC in Perry County, Illinois and at the former Mary Moore mine in Vermillion County, Illinois, closed in 1965 upon the exhaustion of strip reserves, total approximately 7 million tons, and, because of the small quantity of coal involved, could not justify the opening of a mine even by an experienced deep coal operator. *Shipley Stip.* 4; *Tomey Tr.* 337; *Schotters* 12; *DX 87, Table* 2.

---

* The Round Prairie Field is located in Perry and Washington Counties, Illinois, in the Belleville Freight Rate District, and consists of some 44 million tons of coal. Acquisitions began in the field in 1958. *See Findings* 79 *(C) and* 107-15.

E. KNOWLEDGEABLE INDUSTRY WITNESSES CONFIRMED THAT THE UEC-FREEMAN AFFILIATION POSES NO THREAT TO COMPETITION

431. Considering that the Freeman-UEC affiliation is now into its second decade, there is considerable probative value in the testimony offered by knowledgeable industry witnesses on whose alleged behalf the Government brings this action. These witnesses were shown, in terms of both responsibility and expertise, to be particularly well qualified to evaluate the likely competitive effects of the UEC-Freeman combination.* Moreover, they detailed the factors which afforded concrete reasons for their conclusions. Indeed, the Government itself, throughout both its Proposed Findings and Brief, makes repeated reference and citation to the testimony of these witnesses. The Government also devoted extensive discovery efforts to the securing of opinions from both the customers and competitors of United Electric and Freeman as to the effect upon them of the combination challenged. *See, e.g., DX* 46, 66, 73, 77; *GX* 101.

432. As a result of its investigation, the Government admitted in its Answers to Defendants' Interrogatories that it had "no information" as to any competitor who had been or would be "adversely affected or disadvantaged in its ability to compete" or any customer who had been or would be "deprived of actual competition" or "deprived of potential competition" by reason of the challenged acquisition. It did, however, identify those who had informed the Government that the UEC-Freeman combination *would not* have such an effect. *DX* 46.

433. As is detailed below, the documentary and testimonial evidence supplied by these and other witnesses

---

* The Government's lone effort to establish that such witnesses were indifferent to the competitive implications of mergers among coal producers elicited the fact that the witnesses on the stand at the time had, in the past, taken the initiative in complaining to the Department of Justice when his evaluation led him to conclude that another merger between two coal producers did pose a serious threat to competition. *Davis* 753-54.

was uniformly to the effect that the long-standing affiliation between UEC and Freeman has had no anti-competitive effect in the past and is not likely to have *any* such effect, much less a *substantial* one, in the future. Many of these witnesses expressed their considered judgment that the UEC-Freeman combination had already led to significant competitive benefits and that it was likely that there would be further competitive benefits in the future.

The Evidence from Other Coal Producers

434. Responsible executives from large, medium sized, and small coal producers attested to the lack of any adverse effect on competition as a result of the UEC-Freeman competition. When inquired of by Government counsel prior to the filing of the lawsuit, H. B. Lee, Vice President-Sales, Peabody Coal Company, W. B. Buchanan, Jr., President, Old Ben Coal Corporation, and Henry C. Woods, President, Sahara Coal Company, all declared that their companies had not and would not be adversely effected or disadvantaged by reason of the challenged acquisition. *DX* 46.

435. Similarly, during deposition, Clarence V. Beck, President of Little Dog Coal Company, William D. Stiehl, President of Belle Valley Coal Company and Leon King, President of Barbara-Kay Coal Corporation—testified that there neither had been nor would be any adverse effect on their companies because of the challenged acquisition, and that they could see no benefit to forcing Freeman and United Electric to operate independently of each other. *Beck Dep.* 10-11; *Stiehl Dep.* 16-17; *King Dep.* 19-20.

436. Significantly, the only coal producer called by the Government to testify recognized that it would be a mistake to divest UEC from General Dynamics in the belief that the former could remain a viable competitive entity by securing additional strip reserves or successfully making a grass roots entry into deep mining. *Hopper* 1901-1903.

The Evidence from Coal Consumers

437. Documentary and testimonial evidence concerning the competitive implications of the challenged acquisition was also supplied by responsible officials from a representative cross-section of consumers, including large, medium-sized, and small public utilities, a rural electric cooperative, federal electric authority, retail coal dealer, and several industrial concerns. It is particularly significant that this testimony, subjected to Government cross-examination, was supplied by representatives of utilities accounting for the purchase of more than 60 percent of the coal produced in the midwest for the generating of electricity.

438. It was the judgment of these knowledgeable industry witnesses that the longstanding affiliation of Freeman and UEC had had no adverse affect on competition. *Tomey Tr.* 342-343; *Davis Tr.* 703; *Steele Tr.* 942; *Hill Tr.* 1097; *Moser Tr.* 1521. *Corey Tr.* 1611; *Schotters Dep.* 17; *Gaunt Dep.* 27-28; *Morrison Dep.* 26-27; *Ward Dep.* 26-27; *Abrahamson Dep.* 28; *Petersen Dep.* 16; *Redard Dep.* 13; *Nicosin Dep.* 44.

439. Similarly, it was the judgment of these knowledgeable industry witnesses that the longstanding affiliation of Freeman and UEC was not likely to have any adverse affect on competition in the future. *Tomey Tr.* 342-343; *Wood Tr.* 608-610; *Steele Tr.* 942; *Moser Tr.* 1521; *Corey Tr.* 1611-1612; *Schotters Dep.* 17-18; *Gaunt Dep.* 28; *Petersen Dep.* 16; *Nicosin Dep.* 44-46; *DX* 73, 76, 77, 219.

440. Similarly, it was the judgment of these knowledgeable industry witnesses that there would be no benefit to competition if Freeman and United Electric were forced to operate independently of each other. *Davis Tr.* 703-705; *Steele Tr.* 942; *Hill Tr.* 1097-1098; *Schotters Dep.* 18; *Gaunt Dep.* 28-29; *Morrison Dep.* 27; *Ward Dep.* 27-30; *Abrahamson Dep.* 28-29; *Petersen Dep.* 16; *Nicosin Dep.* 46.

441. Before expressing their conclusions, these producer and consumer witnesses testified at length concerning factors bearing on the likely competitive consequences

of the UEC-Freeman combination: including, among others

(a) The role in the market place played by vigorous inter-fuel competition. *Wood Tr.* 661; *Steele Tr.* 936, 940-41; *Gamble Tr.* 1266-70; *Davis Tr.* 693, 698-700; *Moser Tr.* 1517, 1573-74; *Corey Tr.* 1585; *Tomey Tr.* 325-26, 403; *Hill Tr.* 1083; *Morrison Dep.* 8-13, 26; *Abrahamson Dep.* 28, 61-62; *Gaunt Dep.* 22-23; *Ward Dep.* 27-28; *Schotters Dep.* 9-11, 17, 39; *Nicosin Dep.* 46-49; *Beck Dep.* 8; *Stiehl Dep.* 14-16; *King Dep.* 17; *DX* 36, 67, 71-72, 74-75, 78; *DX* 90, *pp.* 7, 9, *center insert; DX* 93, 95, 96, 99, 100; *DX* 146, *p.* 8; *DX* 147, *p.* 13; *DX* 148, *p.* 6; *DX* 149, *pp.* 3, 12-13; *DX* 230, 242.

(b) The impact on coal consumption of the increasing concern with air pollution. *Tomey Tr.* 397; *Steele* 940-41, 956; *Wood Tr.* 604-05, 668; *Davis Tr.* 693, 712-13; *Moser Tr.* 1517-20; *Corey* 1602-05; *Hill Tr.* 1134; *Gamble Tr.* 1326; *Schotters Dep.* 15-16; *Petersen Dep.* 10-14; *Morrison Dep.* 24-26; *Ward Dep.* 28; *Redard Dep.* 7-8; *Nicosin Dep.* 49; *Beck Dep.* 9; *Stiehl Dep.* 13-14; *King Dep.* 17-18; *DX* 71; *DX* 90, *center insert; DX* 91, 92, 97, 100; *DX* 149, *pp.* 3, 18; *DX* 154, 160-162, 163, 176, 178, 179; *DX* 234; *pp.* 6-7; *DX* 238-39.

(c) The important role played by transportation factors in determining the markets that mines in any Freight Rate District are able to serve. *Wood Tr.* 606-07, 680, *Steele Tr.* 936-37, 1001; *Moser Tr.* 1510; *Tomey Tr.* 332-33; *Davis Tr.* 695-96, 702-04; *Hill Tr.* 1087-89, 1094, 1098, 1127; *Gaunt Dep.* 6-7; *Ward Dep.* 11-12, 27; *Redard Dep.* 11-12; *Schotters Dep.* 7-8, 17; *Morrison Dep.* 18-19; *Nicosin Dep.* 41-44, 64-65, 70-71; *Beck Dep.* 6-7, 38-39; *Stiehl Dep.* 7; *King Dep.* 15; *DX* 69, 76, 77, 230, 231; *Beck Dep. Ex.* 1.

(d) The significance of coal quality characteristics in determining the markets that mines in any Freight Rate District are able to serve. *Moser Tr.* 1513-

16, 1534, 1540-42; *Tomey Tr.* 330-32, 334-35; 393-94; *Steele Tr.* 937-38, 944; *Wood Tr.* 607-08; *Davis Tr.* 697-98; *Gaunt Dep.* 19-22; *Ward Dep.* 19-25; *Redard Dep.* 9-11; *Schotters Dep.* 8-9; *Morrison Dep.* 16, 19-20, 46; *Nicosin Dep.* 50-60, 64-65; *Petersen Dep.* 8-10; *Nix Dep.* 7-9, 13-15; *Stiehl Dep.* 8-10; *King Dep.* 8; *DX* 69, *DX* 74, *p.* 3; *DX* 158, 231.

(e) UEC's lack of the coal reserves necessary to compete for future long-term utility contracts. *Wood Tr.* 608-10, 672, 678-79; *Steele Tr.* 969, 997; *Moser Tr.* 1521, 1564; *Tomey Tr.* 335-37, 343; *Davis Tr.* 702, 756-57; *DX* 26, 77.

(f) The fact that UEC and Freeman had long been predominantly complementary rather than competitive producers, and the competitive benefit, in light of this, of Freeman backing up UEC's contract commitments with its own reserves. *Wood Tr.* 610; *Davis Tr.* 702, 730-31, 756-57; *Tomey Tr.* 374; *Hill Tr.* 1086-88, 1097; *DX* 66, 104, 105.

F. THE UEC-FREEMAN AFFILIATION HAS LED TO SIGNIFICANT COMPETITIVE BENEFITS.

442. Not only does the evidence show that there is no likelihood that the UEC-Freeman affiliation will adversely affect competition but, as is detailed in the below Findings, the combination involves significant competitive benefits. *See also Findings* 127-29.

443. One of the principal competitive benefits testified to was the advantage to consumers, as a result of the UEC-Freeman affiliation, of being able to enter into contracts with UEC in which Freeman reserves would be used to back up those of United Electric in such a way as to guarantee that UEC's contract commitments would be fulfilled. Absent such a backup, these consumers testified they would not look to UEC as a potential source of supply able to compete for their business. *Davis Tr.* 702, 730-31, 756-57; *Wood Tr.* 610; *Tomey Tr.* 374. As one utility executive explained, with Freeman's reserves back-

ing up UEC's contract commitment, "it made the package a competitive situation for us," whereas, without the Freeman backup, UEC would not have been in a position to bid "for that portion of our business." *Wood Tr.* 610.

444. Freeman has already delivered back-up reserves on a UEC contract. UEC had a long-term contract to supply the Vermillion plant of Illinois Power Company located approximately 15 miles from UEC's Mary Moore mine. When the reserves at Mary Moore became exhausted before anticipated and the mine was closed, Freeman fulfilled the balance of UEC's contract commitment with coal from its own reserves. *Morris Tr.* 215-17, *see Finding* 356 *(footnote)*.

445. The reserve backup commitments by Freeman involve a price "sacrifice" to it, and would not be entered into by an independent company. They are desirable from the standpoint of a combined UEC-Freeman, however, since they enable UEC to sell all of its coal on long-term contracts for which UEC would otherwise be unable to compete. *Morris Tr.* 217; *Nugent Tr.* 1975-76; *see also Findings* 126-27.

446. Another competitive benefit is the ability which only the combined companies have to fulfill contractual obligations which one of them has undertaken with coal produced by the other during periods of emergency such as mining difficulties, wildcat strikes, or rail or water transportation problems. *Morris Tr.* 211-13; *Nugent Tr.* 1925; *Tomey Tr.* 339-40; *DX* 66, 104, 105; *see also Findings* 355-56.

447. For example, Elmer Hill testified at trial about the value to TVA of the UEC-Freeman relationship, *Hill Tr.* 1084-88. In 1962, a contract between Freeman and TVA was negotiated which also provided for shipments from UEC's Fidelity mine during periods when river conditions foreclosed the mine from its normal markets. *See Finding* 355. Upon its execution, Mr. Hill wrote Freeman and expressed his belief that the provisions of the contract were "good for both of us and we will certainly reap mutual benefit from it." *DX* 104; *see also DX* 103.

448. Because the affiliated companies combine UEC's strip mining skill with Freeman's deep mining expertise, they are able to compete in situations necessitating both strip and deep operations, whereas, were each operated independently, neither would have the requisite skills to be a competitive factor. Already the UEC-Freeman combination has encountered one such situation in connection with the proposed development of a power plant near the Kaiparowitz Plateau in southern Utah. *Tarzy Dep.* 414-27. Were the companies unable to present a proposal involving utilization of the strip mining capability of UEC along with Freeman's deep mining talents, it is unlikely that either would have been a competitive factor. *Tarzy Dep.* 423-25.

G. IMPLICATIONS INHERENT IN THE GOVERNMENT'S APPROVAL — "WITHOUT RESERVATION" — OF A PROPOSED ZEIGLER-MIDLAND COMBINATION.

449. Also significant to an evaluation of the likely competitive effects of the UEC-Freeman combination are the implications inherent in the Department of Justice's approval, "without reservation," of a proposed purchase by Zeigler Coal and Coke Company * of the mining properties being divested by Peabody ("Midland"). *DX* 37. This occurred while the instant litigation was pending and during the effecting of the consent decree entered in *U.S.* v. *Peabody Coal Co.*, Trade Reg. Rep. (1967 Trade Cas.) Para. 84,876 (N. D. Ill. 1967). *DX* 84.

450. A combination of Zeigler and Midland would, in its essential respects, be virtually indistinguishable from the Freeman-UEC combination. Under the terms of the consent decree, *Midland* will be a coal company in Illinois capable of producing 6 million tons per year and controlling 128.5 million tons of reserves. The divested company will operate the Elm and Allendale strip

* Zeigler is also referred to in some exhibits by the name of its subsidiary, Bell & Zoller Coal Company. *See, e.g., DX* 41, *p.* 9; *DX* 61.

mines in the Fulton-Peoria Freight Rate District, and the Mecco strip mine in the neighboring Mineral-Atkinson Freight Rate District. *Compare DX* 84, *Para VII with DX* 37; *see also DX* 50, *Set P-1 Report F-1*; *Weir Dep. Ex.* 1. In 1967 *Zeigler* produced approximately 4 million tons from 5 mines located in the Murdock, Belleville, Southern Illinois and West Kentucky Freight Rate Districts. *DX* 40, *p.* 1; *DX* 50, *Set P-1*, *Report F-1*, *Weir Dep. Ex.* 1. The company controls approximately 550 million tons of coal reserves in the midwest. *DX* 61. A combined Zeigler-Midland would result in a company with 8 mines—3 strip and 5 deep. The combination would have a mine or mines in two states (Illinois and Kentucky), in each of the four largest (in terms of production) Freight Rate Districts in the midwest, and in half the 12 midwestern Freight Rate Districts. *Terleke Dep. Ex.* 11. It would also have oil and gas properties.* *DX* 40 *at p.* 6. The combination, were UEC and Freeman independent, would rank second in coal production in both Illinois and the three state (Illinois, Indiana and West Kentucky) area. *GX* 72, 85.

451. The parallels to the combination here being challenged are clear: UEC-Freeman also combines strip operations with deep operations, also consisted of 8 mines in 1967, and also produced coal in the Fulton-Peoria, Belleville and Southern Illinois Freight Rate Districts. *See Findings* 59-60, 65, 76-77. But there are significant differences: UEC-Freeman has mines in only one midwestern state, in only 4 Freight Rate Districts, it has no oil or gas properties, and has substantially fewer coal reserves than would a Zeigler-Midland combination. *See Findings* 53, 309; *DX* 61.

452. The Government claims that the Freeman-UEC combination, because it results in a company whose coal production is the second largest in both Illinois and the Midwest, so changes the structure of the industry that anti-competitive effects are likely. *Complaint, paragraphs* 16, 18; *Folsom Tr.* 2462, 2483-84, 2573. Such a contention is particularly unpersuasive in view of the fact that

* In 1967, more than a third of Zeigler's net income came from the sale of gas and oil. *DX* 40, *p.* 1.

a Ziegler-Midland combination, which the Government approved without reservation, would have caused the exact same change in the structure of the industry and would, under the Government's theory, presumably have the same competitive effects. *Complaint, paragraphs* 16, 18; *Folsom Tr.* 2589-91.

453. The Government was unsuccessful in its efforts to establish a distinction between the Zeigler-Midland combination, which they would approve "without reservation," and the Freeman-UEC affiliation, which they seek to dissolve. While the Government initially suggested that Zeigler had "lost money," Zeigler's financial statements confirm that the company has conducted profitable operations for at least the past eleven years, and that its financial condition was excellent at the very time of the Department of Justice approval—with the company "determined to make 1969 a banner year." *Compared DX* 38-44 *with Pre-trial Conference of October* 8, 1969 *Tr.* 11. Government counsel was forced to concede that they had "some sympathy with the defendants in the Zeigler matter." *Id. at* 10.

454. Similarly, the Government's economic expert, though hesitant at first, eventually conceded that the competitive implications of the structural changes likely to accompany a Zeigler-Midland combination were essentially similar to those which he thought inherent in the Freeman-UEC combination. *Folsom Tr.* 2589-91.

455. If the Government is satisfied that allowing Zeigler and Midland to combine into the second largest coal producer in both Illinois and the Midwest—with greater reserves than a combined Freeman-UEC—will not harm competition, then the combination of Freeman and UEC —with fewer reserves available for future competition—clearly cannot be likely to lead to any substantial lessening of competition.

456. While the legality under the merger laws of a Zeigler-Midland combination is not before the Court, nor do the parties address themselves to that issue, the Government's approval of that combination makes clear that the competitive effect of the UEC-Freeman combination *cannot be determined by mere structural analysis.* As

even the Government economist finally pointed out, "I would still want more information. I would still want to look further." *Folsom Tr.* 2591. While Mr. Folsom was speaking of Zeigler-Midland, this approach must also be followed in analyzing the UEC-Freeman combination.

H. SUMMARY.

457. The effect of the UEC-Freeman combination has not been, and will not be, substantially to lessen competition among energy resources in any sales area served by either UEC or Freeman, in the Greater Chicago Air Quality Control Region, or for the fuel business of Commonwealth Edison Company.

458. When appropriate consideration is given to the economic realities discussed in all of the above Findings, it is equally clear that the effect of the UEC-Freeman combination has not been, and will not be, substantially to lessen competition in the production or sale of coal in Illinois or in what the Government has defined as the Eastern Interior Coal Province Sales Area.

459. Based upon all the evidence, the effect of the UEC-Freeman combination has not been, and will not be, substantially to lessen competition in any line of commerce, in any section of the country, in view of, among other things:

(A) The fact that the combination has been in effect since 1959 and such effects of that combination as have been shown, have been shown to have been beneficial to competition;

(B) The fact that there has been, and there is very likely to continue to be, an abundance of competition among coal producers generally, and in the midwest particularly;

(C) The fact that for producers such as UEC-Freeman, the utility market for coal has become, and will undoubtedly remain, the only significant outlet for its production;

(D) The fact that in the utility market, producers such as UEC-Freeman face sophisticated, knowledgeable purchasers wielding great economic power and having substantial bargaining strength;

(E) The fact that there is intense interfuel competition which gives utilities and other coal purchasers additional bargaining strength and which puts great pressure upon coal producers to remain competitive;

(F) The fact that increasing concern with air pollution will adversely affect coal producers—particularly high-sulphur coal producers such as United Electric, will place upon them a serious competitive disadvantage in their rivalry with other fuels, and will increase the pressure on them in their attempt to remain competitive;

(G) The fact that UEC and Freeman are predominantly complementary rather than competitive coal producers;

(H) The fact that the only evidence mustered by the Government to support their claim of a substantial lessening of competition are statistics which are unpersuasive because (1) they fail to reflect the very real competition coal faces from other forms of energy; (2) they are grouped in markets which have no economic reality; (3) they ignore the best determinative of a coal producer's market strength—coal reserves; (4) they combine products that do not compete; (5) they ignore the predominantly complementary, rather than competitive, nature of the UEC and Freeman shipments; and (6) they purport to show increasing concentration in coal production when in fact no such trend really exists;

(I) The fact that evidence from a host of knowledgeable industry representatives—including competitors and customers of UEC-Freeman—confirms that the combination has not led, and is not likely to lead to, a substantial lessening of competition, for concrete reasons which they spelled out;

(J) The fact that the Government was prepared to approve "without reservation" a combination of coal producers identical, in essential respect, to the one here challenged, and one that would have evoked a structural change in the industry similar to the one they seek here to reverse;

(K) The fact that virtually all of the economically mineable strip reserves of UEC have been sold under long-term contracts, the fact that UEC has neither the

possibility of acquiring more nor the ability to develop deep coal reserves, and the fact that it has thus ceased to be a competitive force; and

(L) The fact that because of UEC's lack of mineable coal reserves with which to compete in the future, and with no prospect for acquiring them, continuation of its affiliation with Freeman cannot conceivably be adverse to competition, nor would its divestiture provide a gain to competition.

CONCLUSIONS OF LAW

1. The Court has jurisdiction of the subject matter and of the parties.

2. Irrespective of the line of commerce or section of the country in which the competitive effects of the challenged acquisition are examined, the acquisition has not substantially lessened competition or tended to create a monopoly.

3. Counsel for the plaintiff have not established by the preponderance of reliable, probative and substantial evidence on the whole record that the effect of the challenged acquisition may be substantially to lessen competition or to tend to create a monopoly in any line of commerce in any section of the country.

4. The challenged acquisition does not violate section 7 of the Clayton Act, 15 U.S.C., Section 18, as amended.

Respectfully submitted,

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
RICHARD H. IRVING, III

Attorneys for Defendants

Kirkland, Ellis, Hodson,
Chaffetz & Masters
2900 Prudential Plaza
Chicago, Illinois 60601

FILED
SEP 26 1973
MICHAEL RODAK, JR., CLERK

APPENDIX

Volume III—Pages 1017-1284

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

	Page
Relevant Docket Entries	1
Complaint by the United States filed September 22, 1967	10
Excerpts from Deposition of Frank Nugent, taken September 10-11, 1968	18
Excerpts from Deposition of Nicholas T. Camicia, taken September 17, 1968	74
Excerpts from Deposition of John M. Morris, taken September 25 & October 1, 1968	99
Excerpts from Deposition of Frank Frederick Kolbe, taken October 10, 11, 15, 17, 18, 22, 24, 28, 29, 30, & 31, 1968	126
Excerpts from Deposition of Robert H. Inman, taken November 4, 1968	184
Excerpts from Deposition of Joseph C. Tabor, taken November 8, 1968	214
Excerpts from Deposition of Thomas J. Tarry, taken November 14-15, 1968	215

INDEX

	Page
Excerpts from Deposition of Burl Charles Jensen, taken November 21, 1968	291
Excerpts from Deposition of Thomas H. Latimer, taken December 3, 4, & 5, 1968	296
Excerpts from Deposition of Joseph J. Gallagher, taken December 12, 1968	320
Excerpt from Deposition of William L. Kurtz, taken December 12, 1968	323
Excerpts from Deposition of Martha Terleka, taken December 16, 1968	326
Excerpts from Deposition of Charles W. Stadell, taken December 16, 1968	332
Excerpts from Deposition of Harold K. Pedersen, taken December 18, 1968	339
Excerpt from Deposition of John P. Maguire, taken December 23, 1968	347
Excerpts from Deposition of B. H. Sloane, taken March 7, 1969	348
Excerpts from Deposition of Hugh E. Petersen, taken March 13, 1969	365
Excerpts from Deposition of John T. Middleton, taken March 13, 1969	380
Excerpts from Deposition of P. W. Dorrane, taken March 20, 1969	390
Excerpts from Deposition of Leon King, taken March 25, 1969	402
Excerpts from Deposition of Josephine C. Burton, taken April 14, 1969	413
Excerpts from Deposition of John P. Nix, taken April 14, 1969	417
Excerpts from Deposition of Aldo P. Brazzale, taken April 14, 1969	425
Excerpts from Deposition of Clarence V. Beck, taken April 16, 1969	429

INDEX

	Page
Excerpts from Deposition of Winford C. Peterson, taken April 18, 1969	446
Excerpts from Deposition of Harold S. Walker, Jr., taken April 18, 1969	465
Excerpts from Deposition of William J. Stanley, taken April 24, 1969	486
Excerpts from Deposition of Fred E. Nicosin, taken May 15, 1969	498
Excerpt from Deposition of William D. Stiehl, taken May 20, 1969	536
Excerpts from Deposition of Thomas N. Ward, taken May 28, 1969	546
Excerpts from Deposition of Reuben A. Redard, taken June 10, 1969	568
Excerpts from Deposition of Harry B. Gaunt, taken June 18, 1969	576
Excerpts from Deposition of Gordon J. Morrison, taken June 20, 1969	596
Excerpts from Deposition of John Samuel Moore, taken June 20, 1969	614
Excerpts from Deposition of Bernard W. Schotters, taken June 23, 1969	636
Excerpts from Deposition of Leroy M. Abrahamson, taken June 26, 1969	650
Excerpts from Deposition of George P. Gamble, taken June 27, 1969	675
Excerpts from Deposition of Jack A. Simon, taken July 31, 1969	678
Excerpts from Deposition of John E. Organ, taken August 1, 1969	683
Excerpts from Deposition of John Paul Weir, taken August 5, 1969	692
Excerpts from Deposition of S. Smith Griswold, taken August 19, 1969	706

INDEX

Page

Excerpts from Deposition of Bruce C. Netschert, taken August 20, 1969 731

Excerpts from Deposition of Abraham Gerber, taken August 21, 1969 764

Excerpts from Deposition of Peter O. Steiner, taken October 7-8, 1969 781

The Stipulated Testimony of C. C. Smith, dated December 4, 1968 832

The Stipulated Testimony of J. R. Sinclair, dated July 9, 1969, and attached exhibits 1-4 838

The Stipulated Testimony of George H. Shipley, dated July 10, 1969 848

The Stipulated Testimony of George B. Knecht, dated September 3, 1969, and attached exhibits 1-10 851

The Stipulated Testimony of David G. Hemminger, dated September 17, 1969 869

The Stipulated Testimony of John Sant, dated September 17, 1969 870

Excerpts from Transcript of Proceedings before Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, on October 3, 1969 872

Motion of Frank F. Kolbe to be excused from testifying at trial, and attached letter dated March 4, 1970 875

Defendants' Proposed Findings of Fact and Conclusions of Law filed October 27, 1970 880

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, commencing March 30, 1970:

Appearances 1017

Testimony of Jack A. Simon

—cross 1018

—redirect 1037

—direct 1038

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on March 31, 1970:

Appearances 1044

Testimony of John M. Morris

—direct 1046

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 1, 1970:

Appearances 1092

Testimony of John M. Morris (resumed)

—cross 1093

Testimony of Louis R. Tomey

—direct 1105

—cross 1116

—redirect 1128

—recross 1132

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 2, 1970:

Appearances 1134

Testimony of John M. Morris (resumed)

—cross 1135

—recross 1164

Testimony of Reuben Thorson

—direct 1164

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 3, 1970 :

Appearances 1172

Testimony of Victor H. Wood

—direct 1173

—cross 1179

—redirect 1188

—recross 1192

Testimony of A. H. Davis

—direct 1196

—cross 1206

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 6, 1970:

Appearances ____ 1219

Testimony of A. H. Davis (resumed)

—cross ____ 1219
—redirect ____ 1227
—recross ____ 1229

Testimony of Ernest B. Tremmel

—direct ____ 1229
—cross ____ 1250

Testimony of Reuben Thorson

—cross ____ 1255

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 7, 1970:

Appearances ____ 1262

Testimony of Robert W. Steele

—direct ____ 1263
—cross ____ 1269
—redirect ____ 1279

Testimony of Thomas H. Latimer

—direct ____ 1282
—cross ____ 1284

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 8, 1970:

Appearances ____ 1289

Testimony of E. C. Hill

—direct ____ 1290
—cross ____ 1305

Testimony of Richard Drollinger

—direct ____ 1314

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 9, 1970:	
Appearances	1328
Testimony of George Gamble	
—direct	1329
—cross	1349
—recross	1350
Testimony of Thomas Latimer (resumed)	
—cross	1351
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 13, 1970:	
Appearances	1354
Testimony of Nicholas T. Camicia	
—direct	1355
—cross	1362
—redirect	1370
Testimony of Samuel F. Sherwood	
—direct	1372
—cross	1377
—redirect	1384
Testimony of Norman W. Moser	
—direct	1385
—cross	1391
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 14, 1970:	
Appearances	1398
Testimony of Norman W. Moser (resumed)	
—cross	1399
—redirect	1402
Testimony of Gordon R. Corey	
—direct	1404
—cross	1421
—redirect	1443
—recross	1444
—redirect	1446

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robinson on April 14, 1970:—Continued

Testimony of John D. Ames

—direct ____ 1447

—cross ____ 1452

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 15, 1970:

Appearances ____ 1456

Testimony of Daric N. Miller

—direct ____ 1457

—cross ____ 1463

Testimony of Frank Nugent

—direct ____ 1468

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 16, 1970:

Appearances ____ 1487

Testimony of Hollie Hopper

—direct ____ 1488

—cross ____ 1494

—redirect ____ 1509

—recross ____ 1514

Testimony of Frank Nugent (resumed)

—direct ____ 1515

—cross ____ 1529

—redirect ____ 1538

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 17, 1970:

Appearances ____ 1540

Testimony of Thomas L. Craig

—direct ____ 1541

—cross ____ 1553

—redirect ____ 1557

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:

Appearances ____ 1561

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:—Continued	
Testimony of Peter O. Steiner	
—direct	1562
Testimony of Robert H. Quig	
—direct	1593
—cross	1598
—redirect	1599
Testimony of Peter O. Steiner (resumed)	
—direct	1601
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 21, 1970:	
Appearances	1630
Testimony of Peter O. Steiner (resumed)	
—cross	1631
—redirect	1672
—recross	1677
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 22, 1970:	
Appearances	1678
Testimony of James M. Folson	
—direct	1681
—cross	1695
—redirect	1711
*Decision on the Merits entered by the District Court on April 13, 1972	J.S. 1a
Notice of Appeal to the Supreme Court by the United States dated June 7, 1972	1717
Order of the Supreme Court noting probable jurisdiction, dated December 11, 1972	1718

* Not reprinted in Joint Appendix. Citation is to appendix of Jurisdictional Statement.

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

TRANSCRIPT OF PROCEEDINGS

had and testimony taken at the trial of the above-entitled cause before the HON. EDWIN A. ROBSON, one of the Judges of said Court in his courtroom in the United States Courthouse, Chicago, Illinois, commencing on Wednesday, March 30, 1970, at 11:00 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS and
MR. RICHARD J. BRAUN

(Department of Justice, 26th Floor, 219 South Dearborn Street, Chicago, Illinois 60604)

appeared for plaintiff;

[2] PRESENT (Continued):

MESSRS. KIRKLAND, ELLIS, HODSON, CHAFFETZ & MASTERS

(29th Floor, Prudential Plaza, 130 East Randolph Drive, Chicago, Illinois 60601) by

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III
appeared for defendants.

* * * *

[37] THE COURT: I will take that up at the conclusion. Are any of them pertaining to this witness?

MR. CUSACK: No, your Honor.

MR. HEDLUND: I do not believe so.

THE COURT: All right. If they are not pertaining to this witness, that will be taken up separately.

THE CLERK: Will you raise your right hand, please.

(Witness duly sworn.)

JACK A. SIMON,

called as a witness by the Government, having been first duly sworn, was examined and testified as follows:

MR. CUSACK: Your Honor, as we have mentioned to the Court, the Government's direct examination of Mr. Simon is contained in his deposition of July 31, 1969, and this morning the defendants have agreed to also include as one of the exhibits of Mr. Simon, which will be designated as GX-210, his statement before the Illinois Commerce Commission on February 24, 1970. We will provide the Court with copies of that. We have had some copying problems.

[38] THE COURT: All right.

MR. CUSACK: Thank you, your Honor.

THE COURT: There is no objection to that statement, Mr. Hedlund?

MR. HEDLUND: No objection.

THE COURT: All right. The record may so show. It will be incorporated in and made a part of the record, Government's Exhibit 210.

MR. HEDLUND: Has the Government on that basis concluded its direct examination of Mr. Simon?

MR. CUSACK: Yes, your Honor, we have.

THE COURT: You may cross examine.

* * * *

[39] CROSS EXAMINATION

BY MR. HEDLUND:

Q For the benefit of the Court, would you please state your name and occupation.

A Jack A. Simon. I'm principal geologist with the Illinois State Geological Survey.

Q Would you please briefly describe the responsibilities of the Illinois Geological Survey with respect to coal and your own responsibilities therein.

A Well, the Illinois Geological Survey, through its nearly 65 years of existence, has been concerned with assembling all geologic information that they could concerning coal, its occurrence, reserves, associated rocks, coal quality and variety of other things pertinent to the geology of coal.

I started with the Illinois Geological Survey as a part-time student in 1937 to '42 and interrupted by the war. I came back to the Coal Section in 1945 and worked full-time until 1953, I became head of the Coal Section, in which capacity I served until 1968. Since that time I have been principal geologist.

Q Would you birefly describe in general terms the type of information which the Illinois Geological Survey obtains with respect to coal and generally the [40] type of studies with respect to coal that it makes and publishes.

A One of the most basic files in the Geological Survey is a drill records file, which contains about 200,000 drill records of all types, including coal, oil and gas, water, other mineral test holes that have been assembled through the years. We have also sampled and analyzed something of the order of a thousand coal mines through this period and have a large number of additional, miscellaneous analyses.

In terms of other basic information, we have assembled other kinds of records, my notes, notes on the mining conditions of people that have visited the mines, or information that has been provided. In terms of the character of the work that is done in the coal program, the most basic program has been one of what, we term coal reserve estimates, in which from time to time and for

varying areas we estimate the quantity of coal that is present in any given area. We do a great deal of work on the associated strata to help in the correlation of the coal seams and to understand the character of the rocks associated with the coal, both as an aid in correlation and also as an aid in evaluating the mining conditions.

[41] We have a wide variety, then, of fundamental studies on coal that in some measure are the geologic properties that may relate to the use to which coal might be put, whether it is combustion or any other purpose.

Q Does the Illinois Geological Survey provide federal agencies and bureaus with this information for the State of Illinois?

A In general, historically, it has developed that we have because we have had a substantial program in this area, and so frequently other agencies have come to us to provide such information. But I couldn't say they always have, but certainly in most cases.

MR. HEDLUND: Does the Government have a copy of Simon Deposition Exhibit 1?

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. HEDLUND:

Q Mr. Simon, I have handed you a copy of what has been identified as Simon Deposition Exhibit 1. Do you have a copy of that, sir?

A Yes, sir.

[42] Q I wish to ask you a few questions concerning the definitions of terms used in the studies of coal reserves of the Illinois Geological Survey and which have been previously identified as Simon Deposition Exhibit 2 and Jensen Deposition Exhibits 4 through 9, all of which are generally discussed in Simon Deposition Exhibit 1 which is entitled, "An Evaluation of Illinois Coal Reserves Estimates" by J. A. Simon and W. H. Smith.

As I understand it, the term "minable coal reserves" as used in these studies means only that the coal seam is of sufficient thickness and below a maximum depth in the ground to make mining of the coal theoretically feasible, is that correct?

A Yes, I would say that is correct. The theoretical feasibility hasn't been particularly evaluated. It's been a matter of an establishment of a minimum thickness from which we start, and we really haven't evaluated the technical feasibility, but offhand I would say that technically they are feasibly minable, yes.

Q What factors, other than seam thickness and depth, are not included in the way the Illinois Geological Survey uses the phrase "minable coal [43] reserves"?

A Well, I might indicate that there is another factor, too, that we do have. That is the degree of reliability and the fact that the thickness is at one foot increments or less of average thickness, but in general we have not correlated the quality of the coal with the reserves, even though we have a great deal of information on quality. The mining conditions are not evaluated on the statewide basis. The general economic picture, markets, transportation and so on which we generally don't apply to these, the availability of land is of no—we don't generally evaluate that factor in any of our studies. Where some of these others we have on local bases, on land availability we don't at all, and, of course, in terms of Government regulations and controls that may have some bearing in particular areas we don't consider those in our reserve estimates. There may be other—

Q What about specifics relating to state regulations or controls that might affect the technology or the economics of mining? Are these taken into consideration in the phrase "minable reserves"?

[44] A No. In general, state or federal laws and regulations have not been applied to any evaluation of what we report as "minable coal reserves."

Q Then, as I understand it, as used by the Illinois Geological Survey the phrase "minable coal reserves" is synonymous, in effect, with the more simple term "coal reserves".

A As we have used it, that would be correct. As we've used it, that would be correct.

Q Is this phrase usually used in the same sense by other agencies, such as the Bureau of Mines, the United States Geological Survey, or other state agencies publishing similar data?

A I believe that that's correct. However, in use of the term "minable coal reserves", it may very well be defined in different ways in a particular study, and, as a matter of fact, it should always be so defined to make clear what they are referring to as minable coal reserves. But, I think in most cases when minable coal reserves have been referred to, it is principally depth and thickness.

[45] Q Then, as I understand it, there is no intention by the studies of the Illinois Geological Survey with respect to mineable coal reserves to imply that all or even most of the coal reserves can, in fact, and will in the future, actually be mined.

A That's correct. The studies are designed to provide the basis for making such an evaluation but in themselves are not that evaluation.

Q Now, with respect to the phrase "strippable coal reserves," as used by the Illinois Geological Survey, it is my understanding that the word "strippable" is intended to connote only that the coal seam is of a minimum thickness and at a maximum depth to make its removal by strip mining methods at least theoretically feasible.

A Yes, that's correct. It's comparable to what I indicated a while ago relative to mineable coal, that it is not necessary, we are not suggesting that the minimum thickness under the maximum overburden is strippable, but in terms of the definition as it is set forth in the study, that is the minimum thickness and the maximum overburden.

Q What is the minimum thickness criterion used?

A In the strippable coal studies, the minimum [46] thickness that was used was 18 inches, and the reason that 18 inches was used is because there were some small local mines in Illinois that were digging 18 inch coal. This is less than the underground reserve estimates in which on a similar basis and for other reasons 28 inches was assumed as the minimum.

Q What is the maximum depth of overburden that is used to delineate "strippable coal reserves"?

A Well, in this series of reports, we have delineated 50, 100 and 150 feet of overburden, and thickness of

coal at 1 foot increments of thickness, from 18 inches on up, to provide a basis for anybody interested to make an evaluation of what would be truly strippable in those two terms only of depth and thickness, that these reports provide a basic set of data for making a reserve evaluation in terms of true mineability or true strippability.

Now, the 50, 100 and 150 foot overburden lines were determined not because we ever considered that 18 inches of coal would be mineable at 150 feet of overburden, but we could not make any definitions for the users as to where they might want to make the cut-off. So, those data are all in.

Q Then again, as used by the Illinois Geological [47] Survey or others relying on such data, the phrase "strippable coal reserves" is not intended to imply that all or even most of the coal can, in fact, and will in the future be mined by the strip mining method?

A I would say that's correct.

[48] Q In defining the word "strippable", why does the IGS use 150 feet as the maximum depth for "strippable coal"?

A Well, when this study was originally set up about 15 years ago, it appeared that 100 feet perhaps represented the maximum limit that strip mining could go, with mining going underground when they had achieved that. We wanted a higher limit to help define that 100-foot line, because conceivably then if they went to 100 feet in certain suitable situations, they might go a little bit more and greatly increase their reserve.

So to have a higher limit that either would be close to or very far from would help in defining that 100-foot line. We thought of 125 feet, which would have accomplished that. We finally decided on 150 feet, because we thought it would do it just as well, and we had 50, 100 and 150-foot lines.

Actually, about on the order of ten years ago, I think, there were some operations that we began to think perhaps might go over 100 feet appreciably, which made our 150-foot line perhaps look more realistic. But we now have backed off of [49] that. It now appears from our observation, seeing what is being done, rather than having any qualified basis for making the determina-

tion that the 100 foot is the limit, it does appear in the field that operations which are getting up to the order of 100 feet are thinking of going in underground from that point on.

Q In view of the recent legislation pertaining to working conditions in deeper mines, do you believe that there will thus be a rise in this, as I believe you have referred to it, limit of 100 feet after which one would undertake deep mining operations?

A You are referring to the federal legislation?

Q That's correct.

A Relative to underground mining?

[50] MR. CUSACK: Your Honor, the Government objects on the ground it is beyond the scope of the direct examination as set out in the deposition.

THE COURT: The objection may be noted, and the witness may answer, subject to the objection.

MR. CUSACK: Thank you.

BY THE WITNESS:

A It is, I think, too early to fully evaluate what the effect of the new mining law will be. It is my understanding that although it is likely to have some adverse effect on productivity, it is our own not fully qualified observation that laws relative to both strip and underground mines may serve to do that, and we don't have any feeling that one is going to suffer significantly more than the other by present and probable future laws and regulations.

BY MR. HEDLUND:

Q What predictions can you make with respect to prevailing overburden ratios in strip mines in the state of Illinois?

A In terms of predictions, I really would be severely limited, because basically the people who are investing in mining make the determinations of what they economically can go. Offhand I would say that [51] the average for some time hasn't been much over a ratio of overburden thickness to total thickness of much different than 15 to 1. That is, up to that. Although we have had at least one operation that has exceeded 30 to 1 and I couldn't comment other than that it is our present

thinking that perhaps a hundred feet will limit what will be generally done, and this would impose some limits on what stripping ratios would be likely to achieve.

But that is a little speculative, too, so far as the future is concerned.

Q Returning to the Simon Deposition Exhibit 1, as used by the Illinois Geological Survey, what is the meaning of the term "recoverable coal reserves"?

A The word "recoverable" is used a little bit loosely, and is applied in different ways. So far as our application, it has been fairly well established that within a coal field the order of half of the coal that was present originally would be mined. I am speaking now of underground mines.

Q By that you mean that half of the coal that is in place would actually be brought to the surface if and at such time as there was a mine opened?

A Yes. And in general our experience has been [52] that in areas that have been mined, approximately half has been recovered. This figure has been applied much more broadly to coal reserves in general, and I say it should be defined when it is used exactly what is meant. But in general the practice has been in terms of underground coal, and this very widely, that a figure of 50 percent has been assigned to the total coal as "recoverable."

This is without any regard really perhaps to what ought to be minimum thickness cut-offs or other cut-offs, but over-all that has been done, and that basically we followed that general practice.

[53] In general that is the way we have used it to provide a view of it becoming a quite technical point because it really isn't. It is quite loosely used.

THE COURT: Would now be a good time to break for lunch, Mr. Hedlund?

MR. HEDLUND: I think if I could ask one more question, it would be fine, yes.

THE COURT: You may. Please proceed.

BY MR. HEDLUND:

Q Then, Mr. Simon, as I understand it, the term "recoverable reserves" is only intended to provide a dis-

tinction between total coal in the ground and what can be "recovered" after mining losses are deducted, is that correct?

A Yes. That is what is meant by "recoverable coal." But it is used in various ways. That was the only point. But basically it is that in every case. It is the matter of the coal that is recovered from what was originally present.

Q And is it in that sense which it is used by the Illinois Geological Survey in its studies?

A Yes.

Q And again there is no intent to imply that [54] all or even most of the "recoverable" coal reserves can in fact and will in the future actually be recovered?

A That is correct.

MR. HEDLUND: That is all, your Honor. This would be a good time now.

THE COURT: Thank you. We will recess until 2:00 o'clock.

(Whereupon, at 12:30 o'clock p.m., the hearing in the above-entitled cause was recessed until 2:00 o'clock p.m., the same day and date.)

* * * *

[56] AFTERNOON SESSION

2:00 p.m.

* * * *

THE CLERK: 67 C 1632, United States of America vs. General Dynamics Corporation, case on trial.

THE COURT: Good afternoon, counsel. Are you ready to proceed?

MR. HEDLUND: I am, your Honor.

THE COURT: Will the witness take the stand.

JACK A. SIMON,

called as a witness by the Government, having been previously duly sworn, resumed the stand and testified further as follows:

THE COURT: You may proceed, Mr. Hedlund.

MR. HEDLUND: Thank you.

CROSS EXAMINATION
(continued)

BY MR. HEDLUND:

Q Mr. Simon, before the noon recess we were speaking of definitions of terms "recoverable coal reserves," "strippable," "mineable." We had concluded with how the phrase "recoverable coal reserves" is used by the Illinois Geological Survey.

I want to ask you now if this is correct with reference to that, that taking the coal reserve estimates for Illinois as published by the Illinois Geological Survey, since these tonnages reflect coal in place, that, therefore, one must reduce these total amounts [57] by approximately 50 percent to determine the amount of raw coal that can be produced assuming, of course, that the coal ultimately is mined.

A This is correct in terms of the way the figure has been used, but, of course, we don't actually make presumptions of what percentage of the total coal in the ground will actually be recovered.

Q Would you please list the factors necessary for assessing coal reserves other than those published by the Illinois Geological Survey, and perhaps it might be easier if first you discussed briefly the factors that are assessed and information given by the Illinois Geological Survey, and then those factors that are not included.

A Generally, in our reserve studies, both strip and underground, the basic assessment is thickness, to a minimum thickness, in terms of the estimates. In general, we have a great deal of information that covers the entire field relative to the depth, but in underground coal, we have put no depth classification or categorization, but in strip coal we do have the 50, 100 and 150 foot overburden categories.

We also report the reserves at approximatly 1 foot increments of thickness above the average thick- [58] ness, and normally in the underground reserve studies in four categories of reliability, the reliability being based on the reliability of the data used in the mapping.

[59] In the strippable coal reserve studies, in general we have lumped the first two classes of reliability, which

we call 1-A and 1-B in the underground studies, as Class 1 in the strippable studies; and Class 2-A and 2-B as Class 2 in the strip studies.

I believe that that covers the items that we principally consider, which basically are thickness and in some measure depth.

Now, the items that we don't consider on a statewide or regional basis or at least haven't, quality, and we have a great deal of information on quality, but we don't have it sufficiently widespread throughout the state but we can categorize the total reserves in terms of quality.

Q Might I interrupt you at this point to ask you what you mean by "quality"?

A Yes. I am sorry, because I know that very well. The quality really involves different things for different purposes, but basically the quality as it would be assessed by the analysis, which would include heating value, which is related to the rank, the moisture content, the ash content, [60] the sulphur content, perhaps the chlorine, the swelling characteristics, this type of data that are derived from analyses which relate to various evaluations of quality. In general, we do not tie, or we have not tied this analytical work to the coal reserves on a statewide basis because we don't have the data throughout nearly the area that we have reserves.

Another factor is in the assessment of mineability, and mineability involves many things, the quality of the roof, the quality of the floor, water that might be associated with the seam, whether or not there are displacement faults, channel cutouts, a wide variety of geologic factors that may have a serious influence on the mineability of the seam, assessments that we make on local bases, but we can't apply them on a statewide basis.

Another factor, of course, that was mentioned before, state and federal laws and regulations which may in many situations have a major influence on the economic mineability of coal, and we make no assessment of that, and by and large, of course, this is largely outside of our field so that it is not too likely that we will go very far, at least in that area.

[61] Another aspect that we have not tied to the total reserves picture are the factors of economics.

Q Would you mention some of those?

A Well, the availability of markets, the geography of particular operations relative to particular markets or transportation, what the transportations costs are from different areas and to different markets, the general market for coal, the demand at any given time. These are things that within our organization we have touched peripherally but never really to the degree of any assessment of the over-all reserves.

Q What about the exclusions, or—well, let me rephrase it a different way. Do the estimates of the Illinois Geological Survey include coal that underlies towns, highways, railroads, utility rights of way, and other factors that might ultimately prohibit the mining of the coal in any event?

MR. CUSACK: Objection. Asked and answered in the deposition of Mr. Simon, both on direct and on cross, your Honor.

THE COURT: Has that been asked and answered?

MR. HEDLUND: I don't recall it, your Honor, [62] but if Mr. Cusack has looked and has found it, I will not argue with him about it.

THE COURT: All right. The objection is sustained. Let us not have repetition.

BY THE WITNESS:

A I did neglect to mention that there has been no assessment in terms of availability of land also, whether or not the land is available for mining and whether or not blocks of sufficient size could be assembled. This kind of data also have not been included. As a matter of fact, we haven't made any assessment relative to thickness. Our reserves studies report thickness, but we have made no assessment as to what constitutes mineable thickness or maximum overburden. The data are simply presented to provide a guide for such evaluation.

BY MR. HEDLUND:

Q Mr. Simon, in this action the Government contends that the defendant United Electric Coal Companies will be able to acquire additional economically mineable

strip reserves in the State of Illinois to continue its mining operations beyond the time when its existing strip reserves are exhausted. In support of that contention the Government offers as [63] evidence the reserve studies published by the Illinois Geological Survey and the corresponding total strip reserve estimates for the state.

In your opinion can such data be used to support this contention?

A The data are basic to making such an assessment, but the data as we put it out alone could not be used to support that contention alone. It could be used as a starting basis to develop perhaps a total picture, but it cerainly couldn't be used to support that by itself.

[64] Q I would like to ask you finally a couple of questions with respect to what has been identified as Simon Deposition Exhibit 4.

MR. HEDLUND: I wish to pause right here. Is the Government's intention, as previously indicated, to offer this document into evidence, either in your case in chief or in rebuttal?

MR. CUSACK: Yes. It is, your Honor. As your Honor is aware, we have an objection as to materiality of this whole question in regard to coal reserves. We mentioned this in our brief, and I mentioned it in my opening statement. But in the event we are not sustained in that objection, I, of course, will put this into our rebuttal case, your Honor. It is a Simon Deposition Exhibit.

THE COURT: Do you have objection to cross examination on the basis of this, subject to the Court's ruling?

MR. CUSACK: No, your Honor. In fact, it would be proper. It is a Simon Deposition Exhibit, as I say.

THE COURT: All right. You may examine.

BY MR. HEDLUND:

Q Mr. Simon, I hand you what has been marked as Simon Deposition Exhibit 4, which is a bulletin of the Geological Survey, I believe, of the United States [65] authored by Paul Averitt, and entitled "Stripping Coal Resources of the United States."

Would you please turn to page C 4 of that document. In the last sentence of the uncompleted paragraph

at the top of the page, Mr. Averitt says the following:

> "In Illinois ratios larger than 30-to-1 have been handled and are being planned in parts of large scale stripping projects, where the coal is 28 to 36 inches thick."

The record in our case to date indicates that only one mine in Illinois, this one being located in Fulton County, exceeded a 30-to-1 average overburden ration in 1967.

Now, apart from that mine, are you aware of any other "large scale stripping project" in Illinois where ratios larger than 30-to-1 are being presently handled or planned?

A I know of none.

Q On the same page in the last complete paragraph on the page, Mr. Averitt states as follows:

> "Anticipating the trend toward stripping to greater depths, the Illinois and Indiana [66] Geological Surveys in outlining areas suitable for strip mining are including beds with overburden thickness as much as 150 feet."

As that statement applies to the Illinois Geological Survey, that is the portion of it explaining the anticipation, is that statement correct?

A Not in terms of our thinking. As I explained this morning, we used the 150-foot overburden line to help define the 100-foot line, and at no time that I can recall did we anticipate that we would actually—did we think that the mining companies would go to 150 feet.

As I said also, this is not something that we determined. It is the mines that determine what they can technically and economically do.

[67] But offhand I think this probably is just an interpretation of what we have published and he assumed something that we really didn't imply.

Q The Government has offered into evidence Simon Deposition Exhibit 3—

MR. HEDLUND: Do you have a copy which we can provide the Court while I ask one question about it?

MR. CUSACK: I would be happy to provide the copy with this one (tendering document to the Court).

BY MR. HEDLUND:

Q Mr. Simon, I hand you what has been offered into evidence as Simon Deposition Exhibit 3, which is a ten-column chart entitled, "Summary of Strippable Coal Reserves By Average Thickness".

In interpreting that document, Mr. Simon, should one have in mind the definitions with respect to "mineable coal reserves", "strippable coal reserves", and "recoverable coal reserves" that we discussed this morning?

A Yes. This particular tabulation is an unaudited one, but essentially it is a correct tabulation of seven of the nine-part series of publications, and clearly these are totals that do not [68] reflect at all the very detailed breakdown that are in the reports that provide a basis for knowing the various categories by thickness classification.

These are totals—actually, it has the totals by thickness, but they are summaries. It represents a summary of the detail found in the reports it purports to summarize.

Q The title "Strippable Coal Reserves" would, however, have the same meaning as it does when that term is used in the reports which form the basis for that tabulation, is that correct?

A Yes. And, as I think was indicated in the deposition, my deposition, document 1, it was probably a little unfortunate to use exactly that word, but we didn't fully appreciate all the implications. We were simply trying to convey that these are reserves related to this particular type of mining.

[69] Q One more question on this document, which has a number of totals on it.

Is it a principal objective of the studies by the Illinois Geological Survey to add up the total amounts of tonnages in the various categories of seam thickness or overburden depth or, indeed, to gain a total of all coal?

A I'm not quite sure that I understood your question.

THE COURT: Do you want it read back, or didn't you understand it?

THE WITNESS: I didn't understand it.

MR. HEDLUND: Would you read the question back, please.

THE COURT: Will you read the question, please.

(The question was read by the reporter.)

BY THE WITNESS:

A That clearly isn't the objective. The objective is to provide basic data for the use of anyone interested, landowner, industry, Government planners, to provide the basic data for them to make such assessments.

Now, as an outgrowth of that, and this is a common kind of thing, when we are done with a group or [70] when we are done with the full series, we will go through and pull out totals and list summary totals, but this isn't to suggest that that is the final product. The final product are the individual reports themselves that provide the basic data on depth and thickness.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Would the Government have Government Exhibit 50 available?

MR. CUSACK: Yes, we have two copies.

MR. HEDLUND: Can I have one to hand to the Court?

MR. CUSACK: Certainly.

MR. HEDLUND: Will the Government stipulate that the information shown on Government Exhibit 50 is based upon the reports of the United States Geological survey which, in turn, with respect to the State of Illinois, are based on reports of the Illinois Geological Survey?

MR. CUSACK: This exhibit is based on Bituminous Coal Acts, 1968. I believe the Illinois figure is based on work done by Mr. Simon's office.

MR. HEDLUND: Will you so stipulate?

MR. CUSACK: If it is a fact. Why don't you ask him?

[71] MR. HEDLUND: I am asking him, but I am not confident that he will be able to identify this document.

BY MR. HEDLUND:

Q Mr. Simon, I show you what has been offered into evidence as Government Exhibit 50, which is entitled "Remaining Bituminous and Sub-Bituminous Coal Resources

in the Ground as of January 1, 1967 by the Ten Leading States." I would ask you whether you know if the information set forth on this exhibit with respect to the State of Illinois is based on information and data developed by the Illinois Geological Survey.

A I believe I recognize the figure, and I think I know where it was derived, and that was from a re-estimate of 140 billion tons as of '67 or '68—I don't remember—but it was a published figure, and then Mr. Averitt, I believe, deducted coal that was mined and rendered unmineable by mining since the time that we made that estimate and published this figure here. So, if that is the source, and I think it is, then it is correct that it was developed from our data. It is not a figure that we have ever actually presented, but it's based on what we have presented, I believe.

[72] Q Assuming that the figure for Illinois is based on data supplied by the Illinois Geological Survey, again is it then necessary in trying to assess the meaning of the figures shown here for Illinois to have in mind the definition of terms that we have discussed today and the limits and definitions contained in the survey reports themselves?

A Yes, I would certainly agree.

MR. HEDLUND: I have, your Honor, just a brief series of final questions on cross examination relating to Mr. Simon's testimony in Illinois Commerce Commission Docket 55321, which has been offered into evidence by the Government and to which we did not object. I am afraid we have only one copy of this document in the courtroom.

MR. CUSACK: We are happy to cooperate, your Honor.

THE COURT: Thank you.

MR. CUSACK: That is GX-210, your Honor.

THE COURT: Yes.

MR. HEDLUND: May I question the witness from over here (indicating) so that I can follow along?

THE COURT: You may.

[73] BY MR. HEDLUND:

Q I hand you, Mr. Simon, a copy of your testimony in Illinois Commerce Commission Docket 55321 which

was presented, I believe, on February 24 of this year, is that correct?

A Yes, sir.

Q I direct your attention to the bottom of page 18 and the top of page 19, where the following is stated:

> (Reading.) "Generally 100 feet appears to be the current maximum thickness of overburden that limits open cut mining in Illinois, although locally greater thicknesses have been removed. The coal-to-overburden ratio currently practical is quite variable in Illinois because of local economic factors. However, one foot of coal to each 20 feet of overburden appears to be about average . . ."

I want to stop there and ask you if what you are saying there is that the average overburden ratio in the state is 20 to 1, that is, the average overburden ratio being maintained on a consistent basis at mines presently being operated in the state?

[74] A I'm afraid that my sentence was slightly poorly put together because the intent was related to the same overburden limit of about a hundred feet, and our thought that of the order of 20 to 1 as being not an average stripping ratio, because strip mining in the state now, I know averages of the order of about 5 to 1 less than that, that is, of the order of 15 to 1.

So, what I really was meaning to do and did not quite achieve, as you read it, I was speaking of the 100 to 1 ratio and thinking of the order of a hundred feet of overburden for five feet of coal, is about what appears now to be perhaps upper limits of what they are looking at now. I also didn't mean that to be of any future projection either. That was just current thinking, 15 to 1, fairly average, and perhaps up to 20 to 1 as being upper limits, with the exception of this one operation that I know of, and it isn't impossible that there is another, but offhand the only one that I know of goes up to more than 30 to 1, but it is a highly exceptional situation.

Q That operation that you have reference to, I assume, is the one you are referring to in the [75] last part of this sentence on page 19:

(Reading.) ". . . although in at least one area, ratios up to 1 to 35 are anticipated."

A Yes.

Q Do you know whether the 1 to 35 ratio at that operation is anticipated on a continuing basis?

A No, I think that would represent a maximum in the operation, not an average in the operation.

[76] Q I see.

A I think the same is true of the—I don't know—the 30-to-1 may or not be the same. I don't really know what their average is.

MR. HEDLUND: May I have just a moment, your Honor?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Your Honor, I am sorry. My colleague has been unable to find the portion in Mr. Simon's deposition where we covered the exclusion of towns and so forth. Could we have just a moment?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Your Honor, I believe Mr. Cusack's objection is well taken, if, in fact, we covered the question with respect to the exclusion or inclusion of coal, but I do not believe I covered it. The reference that I think Mr. Cusack is making is to a discussion of whether or not town and railroads are [77] included on the face of this map, which has nothing to do with the thrust of my earlier question.

THE COURT: Do you concede that, Mr. Cusack?

MR. CUSACK: I have not read it all, your Honor, on the particular question, but I do not object to the question being asked again.

THE COURT: All right.

MR. CUSACK: I think it was pretty clear what he was talking about, though.

BY MR. HEDLUND:

Q Mr. Simon, my question again was that your total estimates on strip reserves as defined include coal that is underneath towns, railroads, highways, utility right-of-ways, or indeed lakes, such elements as that that might in any event ultimately prohibit mining of coal, is that correct?

A We have made no exclusions, I believe, for the strippable coal, and I believe generally—other than areas already mined out. Areas that have been mined out—

Q Have been excluded?

A —have been excluded, and otherwise culture or other features have not been excluded.

* * * *

[83] REDIRECT EXAMINATION

* * * *

(By MR. CUSACK)

Q It is a fact that the Illinois Geological Survey has been engaged at least until 1957 with the preparation of some very detailed reports with regard to stripping coal reserves of Illinois?

A I am sorry—did you say until 1957?

Q From 1957 to the present time.

A Yes. Actually predating that. At various times through the history of the Survey, they have directed some attention to what we are calling strippable coal reserves, particularly since about 1955.

Q And since 1955 to the present date, the Survey has published various circulars entitled "Strippable Coal Reserves of Illinois," is that correct, sir?

A Correct.

Q Mr. Simon, is the Illinois Geological Survey engaged at the present time in additional work in regard to strippable coal reserves in Illinois?

A Yes. The reports to which you referred are part of a series that was initiated about 1955, and I think perhaps the first one was published in 1957. We divided the state into eight regions, and one of them was subsequently divided into two parts, so it now becomes a

nine-part series, numbered Parts 1 to 8, and there are two areas that have not yet been published. [84] Work is fairly well along on both, but it will be at least a year probably before the first of the remaining two is published.

• • • •

[101] DIRECT EXAMINATION

• • • •

MR. CUSACK: Your Honor, excuse me. I believe that our GX-30 is an excerpt and your DX-102 is the entire thing.

MR. HEDLUND: No. Ours is an excerpt as well. I was under the impression that yours was in total.

Your Honor, we will get this worked out. I will move forward on our exhibit.

THE COURT: All right.

BY MR. HEDLUND:

Q I give you, Mr. Simon, what has been received in evidence as Defendants' Exhibit 102, which is the report of the National Fuels and Energy Study group on an "Assessment of Available Information on Energy in the United States", published on September 21, 1962, and I would like to direct your attention to page 79.

MR. CUSACK: Your Honor, I would just like to know, not wishing to be difficult, but we were not told that the defendants were going to use this document, and although we do not object now, we would appreciate it in the future if Mr. Hedlund would let us know the night before.

MR. HEDLUND: I am sorry. I thought I had given you that information this morning, but I will do so.

[102] THE COURT: All right. You can give that to the Marshal.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: I am sorry, your Honor. That is page 79.

THE COURT: I have it.

[103] BY MR. HEDLUND:

Q Mr. Simon, on page 79 in the last complete paragraph on the page, the following is stated:

> (Reading) "Estimates of the coal reserves of the United States in the sense of the tonnage that can be mined under existing mining practices and economic conditions and constituting the basis of investment have been non-existent."

This was written in 1962. I would like to know from you whether within your knowledge that was true then and whether that continues to remain the case.

A I would say that it's certainly true, because it's very restrictive in what it requires having been evaluated, and it certainly is true.

Q If you will turn, please, to page 80, the second paragraph beginning on that page, it states as follows in part, and I will omit reading the second sentence and the information set forth on the table:

> (Reading) "The Geological Survey's estimate of recoverable coal as of January 1, 1960, totals 880 billion tons. This figure on recoverable reserves has been and is quoted as being equivalent to 2,000 years of production [104] at the current rate. The arithmetic is faultless, but the calculation has little meaning because current rates of output are ephemeral and, second, because there is no indication as to how much it would cost to get the coal produced."

My question to you, Mr. Simon, is as to what your opinion is based upon your knowledge as to whether or not what I have just read was true in 1962 and remains true to the present time.

A I can comment that I would agree with it. I presume that it is true. We resist dividing our reserve figures by a production level to come up with any meaningful figure. So, I would agree with what they have said.

MR. HEDLUND: Your Honor, the Government has announced its intention as part of what I understand to be its rebuttal case to offer into evidence the following publication, "The Search for Low Sulphur Coal," by

Harry Perry and Joseph A. DeCarlo, published by the American Society of Mechanical Engineers in 1967.

I would like to ask Mr. Simon about this document so as to protect ourselves in the event that it is offered into evidence by the Government and is received.

* * * *

[105] MR. CUSACK: The Government objects, your Honor, on the basis that we were not notified that the defendants were going to use this document with the witness.

THE COURT: Looking at the practicality of it, having to call Mr. Simon back here again, I would make the suggestion that he interrogate within this area subject to a motion to strike if you do not use it. Will that be agreeable to you?

MR. CUSACK: Yes, your Honor.

THE COURT: All right.

MR. CUSACK: Thank you.

THE COURT: You may proceed accordingly.

BY MR. HEDLUND:

Q Mr. Simon, I hand you the first three pages of the document that I have just described and ask you to turn to page 3 of that document.

THE COURT: You have not marked it for identification or otherwise? We had better have it marked and then we will have the basis of a motion to strike so that we will know what to do in dealing with that.

MR. CUSACK: May I also please have a copy of the document?

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

[106] MR. HEDLUND: May I ask the court reporter, please, to mark as Defendants' Exhibit 226 for identification a three-page excerpt from an article entitled "The Search for Low Sulphur Coal" by Harry Perry and Joseph A. DeCarlo.

(The excerpt was thereupon marked as Defendants' Exhibit 226 for identification.)

[107] BY MR. HEDLUND:

Q Directing your attention, Mr. Simon, to page 3 of Defendants' Exhibit 226 for identification, I ask you whether or not you know if the figure as set forth on the table with respect to estimated remaining coal reserves in Illinois by sulphur content is accurate?

A We regard that the figure is not accurate, and in the report that was published based on this same study, the figure was not changed, but the item was footnoted. It's an information circular of the Bureau of Mines by Di Carlo and others that is referenced in the Illinois Commerce Commission document. I don't happen to remember the exact number. The figures are shown as they are listed here, but the item is footnoted, something to the effect that it has come to their attention that there is new data that significantly modifies these numbers.

The reserves shown here as less than 2 percent sulphur coal were based on one area in Jefferson, Franklin and Williamson Counties in which our estimates are of the order of one billion tons in the ground, where the figure reported here was eight. We discussed that with both Mr. Perry and [108] Mr. Di Carlo, and they readily conceded that our figure was more valid.

Q Apart from the publications of the Illinois Geological Survey, are you aware of any republication of these figures with respect to sulphur content of Illinois coals that has been released, that is, on a revised basis to take into account the factors you just mentioned?

A We have published as our circular 432 a report on the occurrence of sulphur in Illinois coal in which areas for which there was sufficient information to make an estimate of low sulphur coal reserves, we did make such estimates, and also pointed out a few other areas where low sulphur coal has been reported but for which there wasn't a sufficient information to make reserve estimates. It is presented in quite a different form than it is presented here.

Q Other than the publications of the Illinois Geological Survey, are you aware of any place else where revised figures for Illinois have been published?

A In the recently published document put together by the Department of Health, Education and Welfare—I forget again the exact title—it is [109] also listed in my Commerce Commission hearing. It is a control technology for sulphur dioxide, one of the series of documents that HEW is putting out on various pollutants, and in that document this table modified from DiCarlo and others, actually the published report as opposed to this preprint from an A.I.M.E. presentation, that page was modified and published in that document with the estimates corrected in accordance with our latest information in Illinois.

Q Would the document you refer to be accurately called "Control Techniques For Sulphur Oxide Air Pollutants"?

A That sounds approximately the title. As I say, I'm sorry, I didn't remember exactly the title, but that sounds like it.

MR. HEDLUND: For the record, that is Middleton Deposition Exhibit 3.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. HEDLUND:

Q Mr. Simon, does the University of Illinois maintain a steam power plant?

[110] A Yes, they do.

Q Do you know approximately how many tons of coal per year is consumed at that plant?

A I'm sorry. I don't have any authoritative figure. I could only make a guess which it would be. I have no value.

Q Could we have the benefit of your best guess? Would it be in excess of—

A 150 to 200 thousand tons, I would guess, but I really don't know.

Q Has the Board of Trustees of the University taken any recent action with respect to that power plant?

A I don't have first hand knowledge. It's my understanding that they have—

MR. CUSACK: Your Honor, I object on the ground of hearsay.

THE COURT: Objection sustained.

BY MR. HEDLUND:

Q Finally, Mr. Simon, in October of this year the Northern Illinois Gas Company announced that it had discovered coal deposits in McLean and Livingston Counties, about 100 miles southwest of Chicago—

[111] MR. CUSACK: Your Honor I—

THE COURT: Have you finished your question?

MR. HEDLUND: I have not finished my question.

THE COURT: Let Mr. Hedlund finish his question before your object, Mr. Cusack.

BY MR. HEDLUND:

Q Do you have any information upon which you could tell me whether the coal in that area would be classified by the Illinois Geological Survey as strip deposits or deep deposits?

A Our general knowledge is that the coal is too deep for stripping.

MR. HEDLUND: Your Honor, that is all we have.

THE COURT: All right. You may cross examine.

• • • •

[131]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before the HON. EDWIN A. ROBSON, Judge,

Tuesday, March 31, 1970,

10:45 o'clock a.m.

PRESENT:

MR JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM.

* * * *

[144] MR. KEMPF: The other matter, your Honor, we discussed last evening and again this morning between the parties, which was the subject of the depositions themselves.

We now have reached agreement that all portions of all prior depositions, with the exception of that of Dr. Steiner, are in fact in evidence.

Dr. Steiner's deposition and his exhibit were not designated by either party. I understand the Government is reserving its right possibly to ask the Court that that be received at a future time, but since they are not making that request at this time, it would be premature to raise it.

THE COURT: All right.

[144] Thereupon all the depositions offered were received in evidence, except as to the Steiner Deposition.

[145] MR. KEMPF: We would point out he would be appearing as the Court is aware at the trial.

The only other matter is the question of the deposition exhibits. We have conferred again between ourselves, and there is no objection to the admissibility of any deposition exhibit, other than those Maguire deposition exhibits, which we already have discussed this morning, and which we will undertake to review, and a Latimer deposition exhibit, No. 22, which has not yet been offered by the Government and it is premature to raise that at this time.

The balance of the deposition exhibits which the Government has offered into evidence are received in accordance with the Court's ruling of yesterday, as are the portions of the deposition exhibits which the defendants already have designated.

The only ones that are not in the record at this point are the deposition exhibits which the Government and the defendants have reached agreement about in terms of their admissibility, but they have reserved introducing those until possibly their rebuttal case.

THE COURT: All right.

* * * *

[151] THE COURT: If we do this piecemeal, I will be hearing arguments on different points all of the time.

MR. FUTTERMAN: Thank you.

THE COURT: All right; thank you.

MR. HEDLUND: We will waive our reply, your Honor, for the briefs.

THE COURT: All right.

Are there any other housekeeping matters?

(No response.)

THE COURT: All right. You may call your next witness.

MR. HEDLUND: Your Honor, at this time the defendants call to the stand Mr. John M. Morris.

THE CLERK: Will you raise your right hand, please.

(Witness duly sworn.)

JOHN M. MORRIS,

called as a witness by the defendants, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name, your address and your present occupation.

[152] A John M. Morris, 4320 Narvarez Way South, St. Petersburg, Florida.

THE COURT: Can all counsel hear the witness?

MR. HEDLUND: Mr. Morris, will you speak up, please.

THE COURT: That is not an amplifier, sir. It is merely a tape recorder used by the court reporter.

THE WITNESS: I see. I thought it was an amplifier.

THE COURT: No, it is not.

BY THE WITNESS:

A John M. Morris, 4320 Narvarez Way South, St. Petersburg, Florida, 33712.

My present occupation, I'm retired, but subject to call for certain duties by the United Electric Coal Companies.

BY MR. HEDLUND:

Q What was the position you held upon your retirement from United Electric?

A I was president of the company.

Q Would you please tell me for how long you had been president.

A I was elected at the Board meeting in November, 1959, and retired November 1, 1966.

Q Were you also a member of the Board of [153] United Electric?

A I was.

Q When did you first become a member of that Board?

A 1955.

Q Mr. Morris, would you please briefly describe your basic background, that is, the positions that you have held and with which companies following the completion of your education.

A I graduated from high school in 1917, went to work for the Big Four Railroad at Harrisburg, Illinois, as a clerk, and in 1918 with the Saline County Coal Company in Harrisburg, Illinois, as a billing clerk, later as a salesman, and in 1924 transferred to Chicago where I worked both as a salesman and a traffic clerk. In 1928 that company was sold to the old Peabody Coal Company, and I went to work for the Electric Coal Company, which was a sales company selling the output of United Electric Coal Companies and the Electric Shovel Coal Corporation, and that company went out of existence in '31 or '32, and I stayed with the United Electric Coal Companies in the sales end of the business, and in 1954 I was made sales manager—no. I was made sales manager in about [154] 1948, and in 1954 I was made vice president in charge of sales, and in 1959 president of the company. [155] Q I take it, Mr. Morris that you have been in the coal business, or were in the coal business for the better part of 50 years?

A That's correct.

MR. HEDLUND: Your Honor, I would like to state at this time that Mr. Morris had a lengthy deposition taken by the Government. I do not intend to have Mr. Morris repeat a number of things that were discussed during his deposition, but to discuss with me new material or further explanatory material with respect to his deposition since his deposition is in evidence. As I say, there are a number of things that Mr. Morris discussed with the Government which are now in evidence and I do not intend to recross that ground.

THE COURT: All right.

MR. EISEN: To correct the record, your Honor, you do mean a number of things, answers to questions put by the Government. You are not representing that we had discussed anything privately with your witness, were you, Mr. Hedlund?

MR. HEDLUND: I do not know whether you did or not, but that was not my intention.

THE COURT: All right. Proceed.

[156] BY MR. HEDLUND:

Q Mr. Morris, when you came on the Board of United Electric in 1955, was the company engaged in any merger discussions or negotiations with any other coal company?

A At that time some negotiations were going on with the Truax-Traer Coal Company and they continued for some time. I don't remember how long.

Q At that time, that is, 1955, and during the period when these discussions were going on, why was United Electric interested in a merger with Truax-Traer?

A We, both companies, United and Truax, had mines in the same producing districts, and in a good many cases the coal lands were close to each other. We served to a large degree the same customers, and our reserve position at that time was not too good, and it appeared a consolidation of those two companies would be a good thing, particularly for United, and whatever economies could be made in the cost of production by putting the two companies together would be helpful.

Q Mr. Morris, I direct your attention to what has been received in evidence as Nugent Deposition [157]

Exhibit 38, which is a map of "Shipping Coal Mines in Illinois" by Jack Simon, dated January 1, 1966. I would like to know, in 1955 in what freight rate district in Illinois were the mines of United and the mines of Truax located.

A In 1955 we both had mines in the Belleville District.

Q Is that the district that is down here in the southwestern—

A Southern part of the state.

Q (Continuing.) —portion of the state?

A That's correct.

And, we both had mines in the Fulton-Peoria District.

Q This is the district that sits aside the Illinois River in the vicinity of Peoria, Illinois?

A That is correct.

Q Did United Electric have any other mines in 1955?

A We were still operating the Buffalo Creek Mine, I believe.

Q Where was that located?

A In West Kentucky.

[158] And, Mary Moore at Danville, Illinois.

Q In what portion of the state was Danville?

A That's in the northeastern section of the state.

Q Was that in the Danville Freight Rate District?

A Yes.

[159] Q Do you recall where, if any place, Truax-Traer in 1955 had any other mines?

A They had mines in West Virginia, and that is all that I can recollect.

Q Staying again with 1955, at that time what interest did the top management of United Electric or its Board of Directors have in the deep mining of coal?

A None.

Q Did you have a deep mine at one time, or a deep mining operation, at the Buffalo Creek Mine?

A We tried to use an underground mining machine off of the coal seam going into the side of the pit, and attemping to mine some coal that was too deep to strip and bring it to the pit rather than out through an opening, a slope or a shaft, but that machine failed miserably. It was never a success.

Q Do you recall approximately how long this operation went on at Buffalo Creek?

A A very short time, not over—under two years, at the most.

Q In 1955, did you personally have any interest or experience in mining coal by deep methods?

A No.

Q Did anyone else in the company?

[160] A No one, except possibly people that were out looking for coal, trying to find strip coal primarily, but in doing that frequently they would run across underground properties that might be next door or be in the vicinity, and I think Mr. Latimer, our land man, showed considerable interest in them, and may have brought them to the attention of his people, or his boss, but I never heard anything about it.

Q That is, in 1955.

A That is correct.

Q Again, in 1955, or let's say up until 1958, did Mr. Kolbe express any interest in deep mining?

A I never heard him.

Q I show you, Mr. Morris, what has been received into evidence as Defendants' Exhibit 1, which is a letter, or a memorandum, rather, from Mr. Kolbe to Mr. Hepburn, dated October 9, 1957. The letter states:

> (Reading) "In connection with your memorandum of October 8, I'm sorry that the underground miner did not perform. I believe this method of mining has a great future, but underground mining is not our business, and under the conditions I think the only thing for us to do is to continue to wait until someone in the deep mining field produces a [161] working machine and workable system."

Can you tell us, if you know, Mr. Morris, what the machine was referred to here and how that fit in with the operations of the company?

A That was another machine that was supposed to work off of the bottom into the side of the pit and bring the coal to the pit where it was too deep to strip, and I knew very little about this, but it failed, I knew that, and nothing was ever done with it.

Q Do you know whether or not the machine ever mined any coal at all?

A My recollection is that it did not.

Q I would like to show you now, Mr. Morris, a series of letters that have been received into evidence as Defendants' Exhibits 220, 221 and 222, being letters to Mr. B. L. Slack, dated June 29, 1942; a letter to Mr. Herman Schenck, dated July 23, 1954; and a letter to Mr. Nye F. Morehose, M-o-r-e-h-o-s-e, dated June 11, 1956.

These are not signed copies, but bear the title at the bottom, "President." Showing these to you can you tell me who the president of United Electric was on the dates that these letters were written?

MR. EISEN: Your Honor, I would like to note for [162] the record right now that it was only just before court that we received notice from the defendants that they were going to use these documents, and we hope that we get a little better cooperation in that regard so we can prepare more adequately in the future.

[163] MR. HEDLUND: I believe last evening, Mr. Eisen, and obviously we are now going to have to maintain a list, but I believe I indicated to you that we were going to use these.

MR. EISEN: I stated what I have stated, your Honor.

THE COURT: Let me make the suggestion that each side give a list of the documents they are going to use the day before so there will be no question about it.

All right. Proceed, Mr. Hedlund.

MR. HEDLUND: Can I have my question back, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A Frank Kolbe was president on the dates of these letters.

BY MR. HEDLUND:

Q In the letter of June, 1942, it states:

(Reading.) "We are not interested in operating any coal mines except strip coal mines."

The letter of 1954 states:

(Reading.) "Inasmuch as we confine our operations to strip mining, we would [164] not be interested in this property."

In the letter of 1956, it states:

(Reading.) "Our operations are all strip operations and we are not considering mining deep coal at the present time."

Based upon your knowledge of the facts and your contact with Mr. Kolbe, do these letters accurately reflect Mr. Kolbe's opinions and thoughts and intentions with respect to deep mining during the period covered by these letters?

MR. EISEN: Objection to the form of the question, your Honor.

THE COURT: On what grounds? Why?

MR. EISEN: I do not know how the witness can testify as to what was in Mr. Kolbe's mind in this period. He can testify as to the conversations he had with him on the subject, or anything he can recall of that nature, but what was Mr. Kolbe's state of mind seems to me goes far beyond the possible knowledge of this witness.

THE COURT: All right. Reframe your question.

BY MR. HEDLUND:

Q Mr. Morris, these letters indicate a lack of interest by Mr. Kolbe in deep mining.

[165] MR. EISEN: I object to counsel's characterization of what the documents indicate. The Government will so stipulate, though, if it will shorten it up, that Mr. Kolbe does express some lack of interest.

THE COURT: Let's not get hypertechnical. The clearly indicate a lack of interest.

MR. EISEN: I merely said, your Honor, that we will stipulate that they do so indicate a lack of interest, if counsel can move on to something else.

THE COURT: He is framing a question and you have interrupted in the middle of the question.

Now, finish your question, Mr. Hedlund, and then you may state any objection to it, Mr. Eisen.

Let's proceed.

MR. HEDLUND: May I have the portion of my question back, please.

THE COURT: Read the question.

Q (Read by the Reporter.)

BY MR. HEDLUND:

Q During the period covered, did Mr. Kolbe ever express to you any interest conflicting with that stated here?

A No.

[166] MR. HEDLUND: Your Honor, may I go off the record for just a moment?

THE COURT: Yes.

(There was an off the record discussion, after which the following further proceedings were had herein, to-wit:)

[167] BY MR. HEDLUND:

Q Mr. Morris, the records of the company indicate that in 1956 United Electric began picking up deep coal reserves in Perry County for Amalgamated Industries. Would you first tell me whether or not Amalgamated Industries was a commercial coal company and generally what line or what industry Amalgamated was in.

A Well, they were not a commercial coal producer. They were a metal company.

Q Why did United Electric enter into an agreement with Amalgamated to pick up deep coal reserves for them?

MR. EISEN: Objection, your Honor, to the form of the question.

BY MR. HEDLUND:

Q Would you please explain, Mr. Morris, if you know the circumstances under which United Electric agreed to acquire deep coal deposits for Amalgamated?

A May I answer?

THE COURT: Yes. There is no objection. The question is rephrased.

BY THE WITNESS:

A They were customers of ours, and through [168] one of our sales people, they approached us to put together a block of coal acreage, underground coal acreage, which they expected to use in their manufacturing process at some future date long ahead. This was long-range planning on their part, and it started about that date, 1956 or 1957, and they have not utilized any of the acreage yet for any of their purposes. But that is how we happened to get into it.

Q Did you have any particular interest at the time in the project that United was undertaking for Amalgamated?

A Not at that time, no.

Q Did you at some subsequent time?

A Yes. Later. I became interested after some discussions I had with Mr. Frank Nugent, who came on our Board in 1959. They were underground people and had the experience, the know-how and some equipment, and there looked like there was an opportunity to build a mine-mouth plant. Illinois Power Company had expressed some interest in building a power plant on that coal field, and I got very interested at that time, being in the sales end of the business, and attempted to put together a proposition for Illinois Power using some of the Amalgamated's coal.

[169] MR. HEDLUND: May we go off the record?

(There was a discussion had off the record, after which the following further proceedings were had herein, to-wit:)

THE COURT: Back on the record.

BY MR. HEDLUND:

Q Mr. Morris, do you recall when you first started talking with Mr. Nugent, the president of Freeman, about deep mining possibilities?

A As he became interested in our company from the

standpoint of their stock ownership, I expect it was in about 1957, 1958, along in there.

Q I show you what has been received in evidence as Defendants' Exhibit 4, which is a letter from you to Mr. Frank Nugent, president of Freeman Coal Mining Corporation, dated July 1, 1958.

Is this letter an example of the consultation that you indulged in with Mr. Nugent with respect to deep mining?

A Yes. That is the kind of thing I would take up with him.

Q Do you recall whether or not there were any earlier instances than this?

A I don't recall at the moment.

[170] Q Do you recall the name of the field being acquired for Amalgamated as referred to within the company?

A Beaucoup, if my French is correct.

MR. EISEN: If my French is correct, I believe it means "much coal," your Honor.

BY MR. HEDLUND:

Q Do you recall, Mr. Morris, whether it was before or after July 1, 1958, the date of the exhibit, Defendants' Exhibit 4, that United Electric started acquiring deep coal on its own?

A Do you mean in the vicinity of this Beaucoup Field?

Q That's right.

A It was some time after we made the arrangement with Amalgamated that we started. I can't give you the exact date. It was after, as I stated there.

Q I show you what has been received in evidence as Defendants' Exhibit 5, which is a memorandum from R. J. Hepburn to Mr. F. F. Kolbe, dated July 11, 1958, to which is attached a memorandum from Mr. Latimer to Mr. R. J. Hepburn, dated July 11, 1958, and I ask you if that refreshes your recollection as to when United Electric began acquiring coal, [171] deep coal deposits, for itself?

A Well, from these documents I would say that that is about the time we started acquiring deep coal.

[172] Q What was the name of the field acquired?

A We call it Round Prairie. There was a little town, I believe, in that area with that name.

Q In what freight rate district is Round Prairie?

A It would be in the Belleville district.

Q Would that also be true with respect to Beaucoup?

A Yes.

Q In 1958, July 11th, the date of Defendants' Exhibit 5, what position with the company did Mr. Latimer hold?

A He was called our land man, which meant he was out looking in every direction for principally strip coal.

Q Who was Mr. Hepburn?

A He was vice president in charge of operations.

Q Do you recall whether or not you encouraged Mr. Hepburn to persuade Mr. Kolbe to pick up this field?

A I don't recall, but I must have.

MR. EISEN: I move to strike the answer, your Honor.

THE COURT: It may be stricken.

BY MR. HEDLUND:

Q Did you ever ask Mr. Nugent of Freeman to make a feasibility study with respect to the Round Prairie field?

[173] A I asked him to do it in connection with the discussions we were having with the Illinois Power Company and Amalgamated, but the discussions were terminated because Illinois Power decided to build another unit at their Wood River plant rather than go into the question of a mine-mouth station. As a result, the feasibility study was never made because of the discussions ending before we got into it.

Q In that connection I show you what has been received in evidence as Morris Deposition Exhibit 62, which is a letter dated September 12, 1960, from you to Mr. Frank Nugent. I ask you whether this is the feasibility study or whether this refers to the feasibility study to which you have just referred?

A That refers to it, yes.

Q Do you recall whether or not the possibility of a feasibility study by Freeman was discussed at a Board meeting of United Electric?

A I am sure it was.

Q I show you now, Mr. Morris, what has been received in evidence as Morris Deposition Exhibit 59, which is an unsigned copy of a letter to Mr. Robert S. Overbeck, General Manager of Amalgamated Industries, and signed by—well, the initials in the left-hand corner [174] are "GHU," Secretary.

My first question is, who was GHU?

A That was G. H. Utterback, who was secretary of the company at the time. I will read the letter.

Q The letter states in part that:

"In looking back through our files, I find it was on September 1, 1960, that Mr. Morris, Mr. Sherrill and I met with the following Amalgamated people—"

Do you recall attending that meeting?

A Yes, I do.

Q Would you please, to the best of your recollection, tell me the circumstances leading up to this meeting and what was discussed there generally?

A That was not long after I became president of the company, and I had had no contact with these people, and I felt it was about time I went down there and got acquainted with them. That was the initial purpose. And to find out if we could develop any sort of outlet for that coal, whether or not they would be willing to dedicate some part of the field to us, or if they decided they wanted the coal all for themselves and were going to build a coal mine or have somebody build a coal mine there, and I wanted to find out if we [175] would have first opportunity or what our opportunity would be to do it for them, having in mind that Freeman, who was closely associated with us at that time, would have the know-how as to the operation of that mine.

I did not have in mind that United Electric would do it, and I told him of our relationship with Freeman.

Q Was it before or after or about the same time of this meeting that you had discussions with Illinois Power?

A It must have been about the same time.

Q Do you recall in your discussions with Illinois Power—well, let me ask first, do you recall with whom you had those discussions at Illinois Power?

A Mr. Kraakevich, vice president.

Q Do you recall at that time whether or not you mentioned to Mr. Kraakevich the possibility that Freeman would actually do the mining of the Round Prairie field?

A I am sure I told him that.

[176] Q While you were president, Mr. Morris, did you ever harbor the belief that either the Round Prairie or the Beaucoup field would actually be mined by United Electric?

MR. EISEN: Objection, your Honor. He is leading the witness. He can testify for himself. He is friendly to the defendants, is an employee of the defendant, in retirement. He doesn't have to be led.

MR. HEDLUND: Your Honor, I believe the question is a straightforward one, as straightforward as I can make it. It calls for a yes or no.

THE COURT: He may answer.

THE WITNESS: Repeat the question.

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A No, I did not.

BY MR. HEDLUND:

Q Other than Round Prairie, were there any other deep coal projects or properties that you can recall discussing with Mr. Nugent or anyone else at Freeman?

A Yes. Some deep coal, too deep to strip, at Fidelity Mine. Some coal we were forced to go away and leave near DuQuoin, Illinois, because of the blasting [177] problem. We investigated some coal in Colorado, Utah, which I asked him to give us an opinion on, and which he did.

That is all I think of right now.

Q I show you, Mr. Morris, what has been received into evidence as Morris Deposition Exhibit 42, which is

a letter from you to Mr. Nugent, dated October 27, 1965.

I ask you if the subject of this letter is the deep coal that you just testified to with respect to the Fidelity Mine?

A No. This refers to some coal that we could strip ourselves.

Q Pardon me?

A We could strip this coal, this particular coal, ourselves, but we were having so much trouble with the property owners in the vicinity of DuQuoin because of the blasting shaking their teacups, that we were going to have to abandon some two or three hundred thousand tons of coal that we might strip if it wasn't for that blasting problem.

So I conceived the idea of maybe we could get Frank to pull that coal out with some sort of machine, to the pit, and then we would take it from there to the plant. But the cost factor turned out to be a good [178] deal like what we tried to do down at Buffalo Creek. This was the same sort of thing that we were trying to do at Buffalo Creek back years before.

So we had, as far as I know, to abandon that several hundred thousand tons of coal. Otherwise, we were in serious trouble with the residents of DuQuoin, Illinois.

Q The first and second lines of this letter refer to a Mr. J. N. Matheson, Jr., who was—well, who was he?

A He was an engineer from Freeman Coal Mining Company.

Q Mr. Morris, I show you what has been received into evidence as Morris Deposition Exhibit 55, which is a letter from Mr. Nugent to you, dated April 26, 1965, and I ask if you can explain the circumstances surrounding this letter and why Mr. Nugent was requesting information from you with respect to the Round Prairie field?

A Frank Nugent had put in some new type underground mining equipment at either one or maybe two of his mines. I think it was an English machine, working on what underground people called the Longwall System.

Apparently he thought maybe the conditions at Round Prairie were such that that system could be [179] used

over there. To determine that he had to know the roof conditions, the thickness of the rock above the coal, and some other information which he asked me to secure for him.

My recollection is that the information indicated the Longwall System could not be used in that particular field.

[180] Q Mr. Morris, I show you what has been received in evidence as Defendants' Exhibit 28, which is a letter from you to Mr. Nugent dated March 14, 1966, and ask you to explain why you were discusing this situation with Mr. Nugent at the time.

A Neither United or—

THE COURT: Do you have that exhibit?

MR. HEDLUND: I am sorry, your Honor. I will give you mine.

THE COURT: All right.

BY THE WITNESS:

A Neither United or Freeman had any coal properties in the West Kentucky Coal Field.

BY MR. HEDLUND:

Q Is that at the time?

A At this time. I heard about this. It happens to be right close to my hometown of Providence, Kentucky, and I was very familiar with it. I was going back there to live, I thought, soon after this because that's when I retired, and I brought it to Nugent's attention thinking he might have some interest in taking over those coal lands and operating that mine, but nothing ever came of it because this man Joe Davis, with the help of some other [181] people, went ahead with the mine himself.

Q Was this deep coal or strip coal?

A Deep coal.

Q Mr. Morris, do you recall the Board meeting of United Electric in 1960 at which it was decided to make further additions to the Industry Field, but only at farmland prices?

A I recall it, yes.

Q Do you recall whether Mr. Kolbe at that meeting or in any prior conversations with you expressed any opposition to that decision and to that policy?

MR. EISEN: I object to the form of the question, your Honor. If he wants to examine as to the conversations that the witness had with Mr. Kolbe either at a Board of Directors meeting or at some other place or time, he can lay a foundation for the conversation.

THE COURT: The objection is well taken. Let's divide it, if he discussed it at a Board meeting, or if he discussed it before. Set the time and place.

MR. HEDLUND: May I have the question read, please.

[182] THE COURT: Read the question.

Q (Read by the Reporter.)

BY MR. HEDLUND:

Q Were you present at that meeting?

A Yes.

Q Was Mr. Kolbe present at that meeting?

A The minutes would show, but I'm quite sure he was.

Q Do you recall whether at that meeting Mr. Kolbe expressed any opposition or dissent with respect to the adoption of that policy?

MR. EISEN: Same objection, your Honor.

THE COURT: The objection is overruled. It is not going back to something prior. It is whether he expressed any dissent. It is not overly leading. We have to proceed expeditiously.

He may answer.

BY THE WITNESS:

A I don't recall any objection he made, no.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. HEDLUND:

Q Mr. Morris, I hand you what has been [183] received into evidence as Kolbe Deposition Exhibit Y, which

is a memorandum dated November 7, 1955, from T. H. Latimer to Mr. R. J. Hepburn. In the last paragraph on page 2, Mr. Latimer says in his memorandum the following:

(Reading.) "We have during the years examined something over 200 coal fields. Of those we have taken up either wholly or partially only seven. Some of the best were dropped without going into; some of them taken perhaps not too wisely."

Based upon your knowledge of the facts at the time and before that, were the facts set forth herein by Mr. Latimer true and accurate?

A He made the statement in writing, and I can only say that he was correct, and I would believe what he said.

[184] Q Did you ever bring to Mr. Kolbe's attention any coal reserves that the company turned down?

A In Kentucky again, back a good many years ago, there were two fields that were brought to my attention, being a native down there, and I, in turn, brought them to Chicago, told our people about them, Mr. Kolbe and the rest of them, but nothing was ever done about them. One was the Vogue Mine.

Q Who was it operated by?

A Vogue, V-o-g-u-e, which was operated, I believe, by Peabody.

Q At the time that you brought this to the attention—

A No, this was a virgin field when I brought it in. No production was on it. They later took it over and put a coal mine in there.

The other one was the Pond River field, West Kentucky, and that was developed by the Turtling Brothers from Boise, Idaho, and later I believe sold by them to somebody else. I was nothing but a salesman at that time, and I heard about these fields of coal from my relationship in that state, and I told them about it and they looked at them, and that was the end of it. I never heard any more about it.

[185] Q The last paragraph of Mr. Latimer's memorandum states as follows:

(Reading) "I would like to discuss the entire problem at length with you either here at the office or someplace where we can have plenty of time to go over it thoroughly, as I am afraid we are not building up properly the basis on which our future lies."

Based upon your knowledge of the facts at the time, do you believe that Mr. Latimer's concern was justified?

MR. EISEN: Your Honor, I am going to have to object here. I do not like to unduly delay matters, but the witness at this time had just become vice president in charge of sales. He was a salesman all the way through, had been a salesman up to that time, sales manager. The letter is not addressed to him. I cannot see how he can be competent to comment on this particular sentence as addressed, Mr. Latimer to Mr. Kolbe.

MR. HEDLUND: May I, on voir dire, ask one question, your Honor?

THE COURT: Yes, you may.

BY MR. HEDLUND:

Q Were you a member of the Board of Directors [186] of United Electric Coal Companies at the time this memorandum was prepared?

A Yes.

MR. HEDLUND: I believe he is fully qualified to answer it.

THE COURT: Is there any further comment?

MR. EISEN: I do not see where this qualifies him. If he was a member of the Board, he had just come on the Board.

THE COURT: You have the right of cross examination. I will allow him to answer.

BY MR. HEDLUND:

Q Do you have the question in mind, Mr. Morris, or would you like to have it repeated?

A I would rather you repeat it.

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A I think his concern was justified.

BY MR. HEDLUND:

Q Mr. Morris, I show you what has been received into evidence as Kolbe Deposition Exhibit C, which is a memorandum dated on its last page May 2, 1946, and it is entitled "Memorandum re Fulton County Production."

[187] MR. EISEN: I am sorry. I do not believe we have a copy of that. Kolbe Exhibit C?

MR. HEDLUND: Z, I am sorry.

MR. EISEN: Oh, I am sorry.

BY MR. HEDLUND:

Q It is signed by A. E. Lamm, H. Reid—

A H. A. Reid.

Q (Continuing)—H. A. Reid, and M. M. Soule, S-o-u-l-e.

Could you first tell me who these people were and what positions they held in 1946?

A A. E. Lamm was secretary and treasurer of the company.

Q That is of United Electric?

A Of United Electric.

H. A. Reid was vice president in charge of operations, and M. M. Soule was vice president in charge of sales, to whom I reported.

Q Can you describe for me the circumstances, if you know, attending the prepartion of this memorandum?

A I know that these people were quite concerned at the time about the poor production of our various mines, particularly in Fulton County, and our inability to meet our contract requirements with customers, and [188] business that was offered to us we were unable to take, and I was concerned because at that time, being a salesman, that was my life blood, to get the coal out that we had committed ourselves to. So, I never saw this memorandum, and I didn't know it was written, but I did

know of their concern, because we all talked about it considerably at that time.

[189] Q What was the reasons for your production problems at the time?

A They were trying to use a wheel on the production line, a new wheel, and it broke down too often, didn't accomplish what we thought it would, with the result that our production was badly curtailed. The thinking on the part of these three gentlemen, who had more to do with it than I did, they were going to experiment with something like that, put it aside and use a known piece of machinery to produce your coal with, until you got the machine in such condition as it was operated properly.

MR. EISEN: I would like to object, your Honor, and ask that the witness' answer insofar as what the problem was with these gentlemen, be stricken. He said he had nothing to do with the memorandum and he did not know of its existence. He can testify what he understood at that time or conversations that he had, but to tell what was in their minds and what caused them to write it I think he is not competent to do.

THE COURT: Any comment, Mr. Hedlund?

MR. HEDLUND: I do not believe the witness testified as to what was in their minds. I believe [190] he was testifying as to what he understood them to tell him.

THE COURT: I think the objection is well taken. Objection sustained and the answer is stricken.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. HEDLUND:

Q Mr. Morris, I show you what has been received into evidence as Defendants' Exhibit 26, which is a letter from Q. W. Wellington of the Central Illinois Light Company to you dated January 5, 1966.

Prior to January 5, 1966 do you recall any prior conversations with Mr. Wellington about the reserve situation of United Electric?

A Yes, I had many conversations with him about it.

Q Do you recall in general the substance of those conversations?

A He, of course, knew what we had in the way of reserves at both Buckheart and Cuba Mines, and was concerned about our ability to enter into any long-term contracts that would take beyond the life of the properties there in Fulton County, and on this [191] occasion he refused to extend the contract which we had with him. He had the right to extend it, but the letter speaks for itself.

Q Did you in any of your conversations with Mr. Wellington refer to the reserves of Freeman?

A Yes.

Q In what connection?

A I told Mr. Wellington that we could make a contract with him and incorporate in it, to back up such a contract, an agreement to supply coal from Freeman's Crown Mine beyond the time that we run out of coal ourselves, which would secure him an ample supply of coal over the period of time for which he wanted the contract, and I tried to convince him that that was the thing to do, but up to the time I left, I had not been able to get him to agree to it.

Q Upon your becoming president in 1959, did you disclose to any of the major customers of United Electric the fact that you, that is, the company, was associated with Freeman?

A Yes, I went to our major contract customers, each one of them, and talked to them about it, told them about it, and pointed out the advantages which I thought it meant to them as a customer.

[192] Q What were those?

A A backup for United Electric Coal beyond their period of life at the properties we had, the know-how of underground mining which they had and we didn't have, and generally a much stronger company for them to depend upon as a supplier, which was becoming more important all the time the way these big utilities bought coal.

MR. HEDLUND: Your Honor, I believe that concludes this line. That is, if I go into a new subject now, I will be in it for quite a while. Would this be a good place to break?

THE COURT: Then I believe this would be an advantageous time.

MR. HEDLUND: Your Honor, may we go off the record?

THE COURT: Yes.

(A discussion was had off the record, after which the trial of the above-entitled cause was adjourned to 2:00 o'clock p.m. of the same day.)

* * * *

[194]

AFTERNOON SESSION

2:10 p.m.

* * * *

THE CLERK: Case on trial.

THE COURT: Good afternoon. Are you ready to proceed?

MR. CUSACK: Off the record.

(A discussion off the record was had, after which the following further proceedings were had herein, to-wit:)

THE COURT: Back on the record.

The witness will take the stand.

MR. HEDLUND: May I take up a matter before the witness begins, your Honor?

THE COURT: Go ahead.

MR. HEDLUND: Right at the close of the session this morning there was a Government objection, which was sustained, and the answer was stricken.

We have just received the transcript. I believe that only a portion of the answer should be stricken. This is on page 189.

My question was:

"Q What was the reasons for your production problems at the time?"

The answer was:

> "A They were trying to use a [195] wheel on the production line, a new wheel, and it broke down too often, didn't accomplish what we thought it would, with the result that our production was badly curtailed."

I believe that answer is responsive to my question. The balance of it, I believe, is that which should be stricken.

[196] THE COURT: Do you agree with Mr. Hedlund's contention?

MR. EISEN: I think if I could have a few moments, your Honor, to read the prior question or two—

THE COURT: I am ready to rule on it now, if you have any contention.

I think Mr. Hedlund is quite right on that. I thought he was talking about the thinking on the part of these men, but he said "They were trying to use a wheel on the production line, a new wheel, and it broke down too often, didn't accomplish—"

The latter part certainly are the thoughts of the other men, and the Court will allow the first sentence of that answer on page 189 to stand. The balance of it will be stricken, as the Court has previously ruled.

You may proceed.

[197] JOHN M. MORRIS,

called as a witness on behalf of the defentants herein, having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

(continued)

MR. HEDLUND: At this time I would like to have the Court Reporter mark as Defendants' Exhibit 227 a memorandum dated November 1, 1963 from R. H. Inman to Mr. R. J. Hepburn re Kerr Coal Company.

(The document was thereupon marked Defendants' Exhibit No. 227 for identification.)

THE COURT: Is this marked for identification, Mr. Hedlund?

MR. HEDLUND: For identification, that is correct.

THE COURT: All right.

MR. HEDLUND: I recall, your Honor, this document is one that was originally indicated to us by the Government as being offered into evidence in their case in chief. It has not been at this point, so I believe that we will probably make an offer of this document upon the conclusion of the examination of [198] this witness.

THE COURT: All right.

BY MR. HEDLUND:

Q Mr. Morris, you testified this morning I believe, with respect to a Colorado Coal Company about which you consulted with Mr. Nugent and with Freeman. Do you have in front of you what has been marked for identification as Defendants' Exhibit 226?

A Yes, I do.

Q Is this the coal company and the transaction to which you referred this morning?

A That is one of them, yes.

THE COURT: Excuse me. I thought he said 227. You just said 226.

MR. HEDLUND: I am sorry. It should be 227.

THE COURT: All right.

[199] BY MR. HEDLUND:

Q The first sentence of this document states:

(Reading) "In the afternoon of October 29, Mr. Jerry Swanson of The Freeman Coal Company and I visited the Kerr mine."

What position with Freeman did Mr. Jerry Swanson hold in 1963?

A He was one of their mining engineers.

Q You mentioned that this was one of the situations out in Colorado that you had had in mind. Was there another?

A Yes. We acquired what we called the Hayden Field, near Hayden, Colorado, which had considerable strip area, and surrounding it was a great amount, undetermined amount, a great deal of underground coal, and we consulted with Freeman about what might be done with that underground coal.

Q Approximately when was this?

A I would say not too long before that, or after that, '62 or '63.

Q Mr. Morris, I hand you now what has been received in evidence as Government Exhibit 88, which is entitled "Common Known Customers of The United Electric Coal companies and Freeman Coal Mining Corporation [200] showing destination points, 1965."

MR. HEDLUND: Does the Government have a copy for the Court?

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Would your Honor mind if I waited while they get a copy of this for you?

THE COURT: You can proceed and then I can look at it. Oh, here it is. All right.

BY MR. HEDLUND:

Q As you can see, Mr. Morris, the most left-hand column of this document has a list of customers. The central portion, which is labeled "The United Electric Coal Companies," and gives information on shipments with respect to the mines, the destination, the dollar volume and the number of tons, and there is corresponding information on the right-hand portion with respect to Freeman Coal Mining Corporation, again showing the name of the mine and the destination of the shipments, its dollar volume and number of tons.

Before we go into this, referring to Nugent Deposition Exhibit 38, would you please indicate in which freight rate district the Cuba, Buckheart and Banner [201] mines of United Electric are located.

A In the Fulton-Peoria district.

[202] Q This would be in the area adjacent to, running to the west of the Illinois River around Peoria?

A That is correct.

Q In what freight rate district is the Crown Mine located?

A In the Springfield District.

Q That would be near the town of Springfield, Illinois?

A That is correct.

Q In what freight rate district is the Fidelity Mine of United Electric Coal Companies located?

A Belleville.

Q It would be in this area, in the southern most western portion of the state?

A That is correct.

Q What freight rate district are the Orient 3, 4 and 5 Mines of Freeman located?

A Southern Illinois.

Q That is this area in the southernmost eastern portion of the state (indicating)?

A That is correct.

Q Turning first to the shipments to Caterpillar Tractor Company shown on Government Exhibit 88 for the year 1965, had United and Freeman in that year [203] been independent, would the shipments to Caterpillar have been competitive?

[204] MR. EISEN: Your Honor, that is objected to as pure speculation.

THE COURT: Lay a foundation as to his knowledge, background, and what he would be able to base his opinion on.

MR. HEDLUND: Your Honor, I can do that, but I submit the initial description of Mr. Morris in terms of his selling responsibility and the fact that he was president of that company and has always been in sales—

THE COURT: I think the objection is a proper one. Lay a foundation. Indicate if he has knowledge of these companies and if he had knowledge at that time, had knowledge before, and had knowledge at this time.

MR. EISEN: I also would like to state, your Honor, that it calls for an opinion and conclusion of the wit-

ness, and it asks him to answer one of the ultimate issues in the case.

THE COURT: The Court will consider it in its context. If he has the background and the knowledge and the foundation is laid for that, I will rule later on that objection.

You may proceed.

BY MR. HEDLUND:

Q Mr. Morris, when did you become president of United Electric?

[205] A November, 1959.

Q Would you tell us what responsibilities after 1959 in your role as president you had with respect to the contracts of United Electric Coal Companies?

A Reports were made to me on all of the activities of our sales department, as to what they were doing and where, and I still had over-all supervision over sales as president; the vice president in charge of sales reported to me and kept me informed as to what was going on after I became president.

I personally took part in discussions with some of the major customers, particularly Union Electric, Northern States Power, Interstate Power, and Central Illinois Light.

I did not in all cases go and see them, but some that I knew quite well in my experience as sales manager and then vice president I continued to keep in contact with.

Q Did major coal contracts routinely come to you for your approval prior to their execution?

A Yes, they did.

[206] MR. HEDLUND: I submit, your Honor, that I have established a foundation for pursuing this line of questioning with this witness.

THE COURT: Is there any objection?

MR. EISEN: Same objection. I do not see where he has cured the hypothetical aspect of the question.

THE COURT: Me may answer the question, with your objection noted as to that question.

He may answer, subject to the objection.

MR. HEDLUND: Mr. Reporter, can you find the question?

(The pending question was read.)

BY THE WITNESS:

A No.

BY MR. HEDLUND:

Q Would you explain why.

A Cuba-Buckheart, our own properties, mines, go to certain destinations, where they have the freight rate advantage. Crown Coal went to other destinations, where they had the freight advantage.

Q Focusing specifically on the shipments to the Capterpillar Tractor Company, would you describe with respect to Caterpillar the plants to which United could ship and the plants to which the Crown Mine could ship?

[207] A The Crown Mine could ship to Decatur, Illinois. We could not. Our mines could ship to East Peoria, and Montgomery, and they couldn't.

Q With respect to the shipments in 1965 shown on Government Exhibit 88 to the plants of Central Illinois Light Company, had the two companies been independent in 1965 would the shipments have been competitive?

A No.

Q Could you explain—

MR. EISEN: Same objection, your Honor.

THE COURT: You may have a standing objection, and he may answer subject to that objection. You have the right to cross examine. After that, you may move to strike if you desire.

MR. EISEN: Thank you.

THE COURT: Proceed.

MR. HEDLUND: Do you have my question in mind?

THE WITNESS: Yes. I understand it.

BY MR. HEDLUND:

Q Your answer is—

A No, I said no.

Q Could you explain why?

A We could reach Peoria from our Cuba-Buckheart

mines, and they could not. They could reach Springfield, and we could not.

[208] Q With respect to the shipments to the Grand Tower Plant of Central Illinois Public Service Company, would the shipments of the Fidelity Mine and the Orient Mine, had the two companies been indepeedent, have been competitive?

A No.

Q Will you explain why?

A In the case of Orient, they shipped in there what is known as dust, which is a by-product made from careful preparation of metallurgical coal and which is sold at less than cost and to certain plants that are able to use it.

In the case of Fidelity, it was a very small amount of carbon which we make occasionally, not very often, and it was a dump proposition on our part.

Q With respect to the shipments in 1965 to Central Illinois Public Service Company, to the Meredosia Plant of CIPS, would those shipments have been competitive had the two companies been independent?

A No.

Q May I have your reasons?

A That is a normal market outlet for Fulton County coal, directly on the river.

[209] Q Pausing there, can you tell me where Meredosia is, approximately?

A It is south of Havana, Illinois on the Illinois River.

Q It would be approximately here (indicating)?

A I can't see from here.

Q Why don't you come over—

MR. EISEN: The Government will stipulate it is south of Havana on the Illinois River.

THE COURT: All right. You may proceed. The record may so show.

BY MR. HEDLUND:

Q Would you continue, please?

A So the transportation situation so far as Fulton County mines was concerned, it was very much to our advantage there.

The Crown coal that went in there is again a by-product dust.

Q Let me stop you right there. While you were president did United Electric produce or sell any dust?

A No.

Q Why is that?

A We had no high-priced domestic or [210] metallurgical coal. Our coal wouldn't suit that purpose, and we just didn't make it, couldn't make it. Our plant wasn't set up to make it.

[211] Q Turning to the third page of this document, Mr. Morris, and the shipments shown to the Tennessee Valley Authority, would the shipments from the Fidelity Mine and the shipments from the Orient Mines have been competitive had the two companies, United and Freeman, been independent?

A No.

Q Would you explain that, sir.

A The shipments from Fidelity Mine were put on a contract taken by Freeman at a price below our cost. We used it as a dump in certain periods of the year when we couldn't market all of the coal we mined, and to keep the mine running we could ship on that contract if and when we pleased, and we did not take any order in there ourselves because it was too low to commit yourself on a long-term or even a yearly basis. We simply used it as a convenience.

Our transportation was such that we couldn't net at the mine a fair price for it.

Q With respect to the shipments in 1965 to the Venice plant of Union Electric from both Freeman and United, would those shipments have been competitive had the two companies been independent?

A No.

[212] Q Would you explain why?

A Venice is another plant that is able to use this refuse or this byproduct called dust, and you will note that we only put 3,000 tons in there from Fidelity. I can't tell you how that happened to go in there.

Q Is the Venice plant, to your knowledge, served by other producers in the Belleville district?

A Not to my knowledge.

Q With respect to the shipments in 1965 to the Meramec Plant of Union Electric from the Fidelity Mine and the Orient Mine, would these shipments have been competitive had the two companies been independent?

A No.

Q Would you explain that, sir.

A The Meramec Plant is a natural location and outlet for Belleville coal on the river due to transportation charges, and the coal that Freeman put in there is again dust or a byproduct.

Q With respect to the 1965 shipments to Wisconsin Public Service Company in Green Bay, Wisconsin, would those shipments have been competitive had the two companies been independent?

A No.

[213] Q Would you explain that, please.

A The requirements of those plants at Green Bay, their specifications and their boiler equipment, required a high BTU, high quality coal, such as Southern Illinois, and we could not bid on it. Their specifications prevented us from even making a proposal. Freeman had trouble fulfilling their obligation, and came to us and allowed us to ship this tonnage, which was mixed, as I am quite sure, at the dock in Chicago as it went into the boat.

Q Why was it necessary to mix it?

A They couldn't run their plant on Fidelity coal by itself. It wasn't strong enough BTU coal.

[214] MR HEDLUND: I believe I misspoke before this in saying the page that we were reading from. I believe that is page 4 of Government Exhibit 88. I would like to back up to, in fact, page 3.

THE COURT: I only have four pages, and this is page 3 that you are reading from.

MR. HEDLUND: That I was just reading from, your Honor, in your copy?

THE COURT: Yes.

MR. HEDLUND: Yes. Well, I believe that should be page 4, because that is the final page of this document. That is the total tons. So, we will try to get it resorted.

BY MR. HEDLUND:

Q May we please turn to the page that starts with Dairyland Power Cooperative, in whichever order it appears.

Would the shipments from Freeman and United Electric to the Alma and Stoneman Plants of Dairyland Power Cooperative have been competitive had the two companies been independent in 1965?

A No.

Q Would you explain that, sir?

A Those plants are located directly on the [215] Mississippi River and transportation-wise are, for the Belleville District Mines, including Fidelity, their best market. The coal that Freeman put in there again was the by-product known as dust.

Q With respect to the shipments in 1965 to Foote Minerals KEMCO Operations in Keokuk, from both the Orient Mine and the Cuba and Buckhardt Mines of United Electric, would those shipments have been competitive had the two companies been independent?

A No.

Q Would you explain that please?

A Cuba Mine is located on the TP&W Railroad, which is a direct route to Keokuk, and we have a very favorable freight rate in there which makes it a natural market. The coal that Orient put in there was dust which they shipped by barge up the Mississippi River. Two different types of merchandise.

Q With respect to the shipments in 1965 to the Vermillion Plant of Illinois Power Company from both the Mary Moore Mine and the Orient No. 4 and 5 Mines, would those shipments have been competitive?

A No.

Q Before I ask for your reason, in what [216] freight rate district was the Mary Moore Mine of United Electric located?

A Danville.

Q That is over in the far eastern portion of the state?

A Yes.

Q Where is the Vermillion Plant, or rather, where is Oakwood, Illinois?

A Right northwest of Danville, about eight miles.

Q How far was the plant? Do you recall how far approximately the plant was from the Mary Moore Mine?

A Fifteen miles.

Q Could you now give me your explanation as to why these would not have been competitive?

A That was the reason. We had a very low freight rate in there. The mine was put in to supply Illinois Power when they built that plant there, and the Freeman shipments were to fill out a contract on which we owed some tonnage, and could not deliver because we ran out of coal at the Mary Moore Mine.

[217] Q Do you recall through what period of time your United contract ran with Illinois Power for its Vermillion Plant?

A I've forgotten when the mine started, but it was the entire output of the mine from the time it started, and then we began to run out of coal in about 1962 and we made an extension with them where they agreed to extend the contract if we picked up some more coal, which we did, but we didn't get as much as we thought we had, and that second deal we ran out of coal and shut the mine down in 1965. That was when we had some tonnage left that we had estimated we were going to mine and couldn't mine, and the Illinois Power took the position they thought that should be fulfilled, and they knew of our relationship with Freeman, and I told them of it, and Freeman agreed to ship the tonnage although it was a sacrifice to them.

Q Did Freeman continue to ship the tonnage until the end of the United Electric contract?

A They shipped until they completed the original estimate that we had given Illinois Power as to how much tonnage would be available under that contract.

Now, how long that was, I can't answer you right now.

[218] Q With respect to the Hennepin Plant of Illinois Power, could that plant have been served competitively by any Freeman mine?

A No.

Q With respect to the Wood River Plant of Illinois Power, could United Electric have shipped competitively to that plant, competitive with the shipments shown here

in Orient No. 3, had the two companies been independent?

A That was Freeman's shipments in there with again this byproduct, dust, and we couldn't compete with that. Belleville Coal did go into that plant on a unitized train rate set up by the GM&O Railroad, and we weren't on this GM&O, so we couldn't participate in that movement.

Q With respect to the shipments shown in 1965 to the East Chicago Plant of Inland Steel Company, would those shipments from Cuba, Buckheart and Orient have been competitive had the two companies been independent?

A No.

Q Would you explain that, sir.

A Two different kinds of coal. Our shipments were steam coal going into their boiler plant. Freeman's [219] shipments were metallurgical coal for making steel.

Q While you were president, did United Electric produce any metallurgical coal?

A No.

Q Could it have?

A No.

Q Finally, with respect to the shipments in 1965 to Marquette Cement Manufacturing Company to various plants from Cuba, Buckheart and the Orient Mines of Freeman, if the companies had been independent would these shipments have been competitive?

A No.

Q Would you explain that, sir.

A Our coal went to the Oglesby Plant of Marquette, which is near LaSalle, Illinois, on the river, where we had the advantage of low transportation cost by river. Orient coal went to Cape Girardeau, Missouri, Des Moines, Iowa, and Milwaukee, and we had no coal that would compete with them for that business at those plants.

Q I hand you now, Mr. Morris, what has been received in evidence—and does the Government have a copy for the Court—of Government Exhibit 89, which is a similar table for the year 1966.

Mr. Morris, with respect to the shipments [220] shown in Government Exhibit 89 for the year 1966 with respect to Caterpillar Tractor Company, Central Illinois Light Company, Central Illinois Public Service, Dairyland Power

Cooperative, Foote Minerals KEMCO Operation, Illinois Power, Marquette Cement, Tennessee Valley Authority, Union Electric and Wisconsin Public Service, were I to ask you exactly the same questions with respect to these shipments in 1966 as I did with respect to these shipments in 1965, would your answers be the same?

A They would be the same.

[221] Q Mr. Norris, I hand you what has been received in evidence as Defendants' Exhibit 27, which is a one-page memorandum with an attachment from Dale Emling to you, dated March 8, 1966. I hand this to you and wish to ask first who Dale Emling was?

A He was our chief engineer at this time.

Q Why did you ask Mr. Emling to compile this information shown on the attachment?

A To report to our Board of Directors our reserve situation as of that time.

Q Do you recall the purchase by United Electric of coal reserves from Union Collieries Corporation in 1958?

A Yes, I do.

Q Who was Union Collieries?

A It was a coal producing company owned by the Union Electric Company of St. Louis, and their entire output was used in the Union Electric Company's plant.

Q Did Union Collieries have a mine?

A Yes.

Q Where was that located, if you know?

A Right near our Fidelity Mine, known as [222] Kathleen.

Q Would that be in Perry County, Illinois?

A Perry County, yes.

Q What freight rate district would that be located in?

A Belleville Freight Rate District.

Q Could you please explain the circumstances surrounding the purchase of these reserves from Union Collieries?

A The Union Electric Company decided they wanted to get out of the coal mining business.

Q Did you say Union—

A They decided they wanted to discontinue mining coal.

Q I did not understand whether you said Union Electric or United Electric.

A Union Electric. Not United Electric, no.

Q Sorry.

A And they had some strip coal which was right close to us. They had some underground coal left. They were going to abandon this mining and buy their coal, which was very interesting to us. We worked out an arrangement to buy the strip land, and we had to take the underground coal with it. It was contiguous to it.

[223] Later we were able to make a contract with Union Electric to ship a substantial tonnage from our Fidelity Mine.

Q What became of the mine itself, its equipment and tipple?

A The Truax-Traer Coal Company bought the tipple and other equipment, and I am not sure what they did with it. They disposed of it. They also later were able to make a contract to ship coal to the Union Electric Company's plant.

MR. HEDLUND: Does the Government have an exhibit designation for the 1961 annual report of United Electric?

MR. CUSACK: It is a Government exhibit, your Honor. It is in evidence.

MR. HEDLUND: I realize that. I just wanted to describe it for the record.

BY MR. HEDLUND:

Q Mr. Morris, I hand you page 7 of the 1961 annual report of the United Electric Coal Companies, which has been received into evidence as Kolbe Deposition Exhibit 7.

MR. CUSACK: Excuse me. That is Government Exhibit Kolbe Deposition Exhibit 7, which is also Nugent Deposition Exhibit 26, for the record, your Honor.

[224] THE COURT: We have two designations, and I should like to know which we are going to use for the purpose of the record.

MR. CUSACK: Government Exhibit Kolbe Deposition Exhibit 7, the 1961 annual report.

THE COURT: All right. Just so I am clear in my

own mind, there won't be any conflict between this numbering and the other Government numbering, will there?

MR. CUSACK: No, your Honor.

THE COURT: You may proceed.

BY MR. HEDLUND:

Q Directing your attention, Mr. Morris, to the paragraph on page 7 which is headed "Coal Deposits," it reads as follows:

> "At the year end your company owned or controlled 122 million tons of recoverable coal deposits. This tonnage is greater than in previous years because for the first time we are including underground coal. The total amount that can be mined by the strip method is 86 million tons, and 36 million tons are suitable for underground mining.
>
> "We have confidence in the future of coal, and we continue to add to our holdings [225] when worthwhile deposits are offered to us."

My first question is, as used in the annual report for 1961, what did the term "recoverable" mean as used in "recoverable coal deposits"?

MR. EISEN: Objection.

[226] THE COURT: What grounds?

MR EISEN: It calls for an opinion and conclusion of the witness. If he wants to ask him what he considers it meant in his own mind, that is all right, but the annual report has to be passed on by the Board of Directors, and there was discussion about it. If he wants to ask him about conversations they had at the time the annual report was passed upon and approved or whether they discussed the language to be used, that would be appropriate.

However, to ask this man what the term means as used in the annual report, unless it is part of his own letter, and I do not think it is, I think is improper—it is a part of the report in general.

THE COURT: In my looking at it, it is signed by this witness.

MR. HEDLUND: He was the chief executive officer of the company at the time and responsible for the annual

report. I believe he is qualified to testify as to what was intended to be meant by the term.

MR. CUSACK: Your Honor, the letter is signed at page 3, and this follows on page 7 in the body of the annual report.

[227] THE COURT: Well, in my reading of it, and I just looked at it, they are enclosing the annual report, and he goes on to express his appreciation and all that.

The objection is overruled. The witness may answer.

BY MR. HEDLUND:

Q Do you have my question, or should I repeat it?

A I might say that I dictated that myself. The reason it was used for the first time was because we included underground coal in our total for the first time.

Q Why did that require you to use the word "recoverable", then?

A Because you don't recover over about 50 or 60 percent of the coal that you have under lease or in the ground when you mine it by the underground method, whereas by stripping you get nearly all of it.

So to be perfectly clear to our stockholders, the people that read this report, I wanted to make sure they understood that this was recoverable if we mined that underground. For instance, we might have under lease 36 milmion tons and can [228] only get 18 million if you mine it by underground mining.

That was the reason.

Q Was there any intention to imply that all of the deposits were economically recoverable?

A No.

[229] Q The same wording occurs, and counsel for the Government can correct me if I am wrong, the same wording reoccurs in the annual reports to the company for 1962, 1963 and 1964.

Now, Mr. Morris, in those reports is the same meaning of the word "recoverable" intended as it was in this one?

A That is correct.

Q Why did you disclose in the 1961 annual report for the first time to your stockholders that you held deep coal deposits?

A By that time we were closely associated with the Freeman organization, and Frank Nugent thought our stockholders were entitled to know of this underground coal, because with our close association with Freeman, it might be possible for them to mind it for us, and he felt it should be disclosed in all fairness to the stockholders, that they should know about it.

Q Do you recall whether or not the decision to disclose the deep coal deposits was discussed at a Board meeting of United Electric?

A It was.

Q I notice, again, in the 1961 annual report that the terminology with respect to coal reserves [230] was changed from that in prior years; whereas in prior years these were refered to as "strip coal reserves," in 1961 and subsequent years they were referred to as coal "deposits."

Why was this change in terminology made, if you know?

THE COURT: What paragraph is this?

MR. HEDLUND: The word "deposits" appears—

THE COURT: I thought you were quoting.

MR. HEDLUND: No.

THE COURT: All right. Go ahead.

BY MR. HEDLUND:

Q Would you answer the question.

A Again, that was a question of properly informing our stockholders. "Total reserves" to me and other members of the Board meant that those coal lands would be mined and sold, that coal would be produced in our list of coal deposits, with some isolated areas that probably never would be mined, and it appeared that might be misleading to our stockholders. So rather than to specify it as "coal reserves," which were adjacent to an operating mine and definitely would be produced, the Board decided to change this to "coal deposits," so we wouldn't be charged with misleading the public and the stockholders.

[231] Q Mr. Morris, I show you now what has been received into evidence as Government Exhibit 203, which

are the minutes of the United Electric Coal Companies' board of directors meeting of July 13, 1962.

Does your copy have page 4152?

A Yes.

Q The top paragraph reads:

> "The chairman then presented a resolution approving this company's action in signing a coal lease with United States Steel Corporation under which the life of Mary Moore would be extended for some four years."

Is this the acquisition to which you earlier have referred with respect to the extension of the Mary Moore?

A Yes, it is.

Q Mr. Morris, I hand you an excerpt from the meeting of United Electric's board of directors on May 10, 1963, which is page 4201, and which is Government Exhibit 204.

Referring to page 4201, the following is stated:

> "The chairman stated that some [232] form of heat dried Fidelity screening is becoming necessary. During the past winter the Fidelity shipments in some cases were restricted in favor of heat dried competitors' coal, and this experience is becoming more prevalent each winter.
>
> "Inasmuch as the life of the mine will extend at least another 20 years, it is possible that the investment in a complete new cleaning plant—" and so on.

Would you tell me on what basis the prediction was made that the life of the Fidelity Mine would extend 20 years?

MR. EISEN: I think it said "at least 20 years".

BY MR. HEDLUND:

Q At least 20 years.

A That was a guess at that time, based on what we had, what I thought we could acquire adjacent to the properties, and also to justify the purchase of this heat drier, I included in my own thinking the possibility

that Freeman would mine that underground coal eventually that we had from Union Electric and bring it through this plant.

The total of all that at that time, [233] plus the fact that our annual production rate was expected to decline as we got into deeper overburden, which we were faced with very shortly after this—with all of that, that 20 years was about right.

[234] Q I hand you now, Mr. Morris, what has been received in evidence as Morris Deposition Exhibit 14, being a letter dated May 3, 1965, from yourself to Mr. Frank Nugent.

In the past paragraph at the bottom of the page there is the following:

> "If we complete our trade with Truax-Traer, because of the difference in overburden depths and thicknes of coal seam, we give up nearly 2 million tons more in the North Canton ares than we get back from them in the West Cuba field.
>
> "Our reserves picture would then change by a reduction in the 41 million tons of Buckheart and gain at Cuba, so our Buckheart reserves will then total approximately 33 million tons, and our Cuba reserve approximately 8 million tons.
>
> "At an estimated 22,500,000 tons a year production with Buckheart, we would then have about 14 years life there, and, as indicated above, from 8 to 10 years at Cuba."

THE COURT: You stated "22,500,000 tons". My copy has "2,500,000."

[235] MR. HEDLUND: Thank you. I certainly should not have stated 22,500,000.

BY MR. HEDLUND:

Q First of all, Mr. Morris, was the trade with Truax-Traer completed?

A Yes.

Q By the time this letter was written?

A It was not completed on May 3, 1965. It says there "If we complete our trade". It was completed after that.

[236] Q Since your deposition, have you had an opportunity to look at the records of United Electric Coal Company to determine as a result of this trade with Truax what you actually acquired from them and where and what you actually gave up?

A I can only give you what I was told in our office without looking at any documents. I was told that by our present general manager in charge of production, but I did not look at any actual engineering records. He simply told me what had developed over there.

Q Can you tell me what he told you?

MR. HEDLUND: Your Honor, we have evidence that will support this, but if I may continue with him as to what his understanding was.

THE COURT: All right.

BY THE WITNESS:

A He told me that at Cuba, instead of this 8 million tons, we actually wound up with only 4 because of some faults in the coal and some other difficulties that developed, so we had to rearrange the trade so that we would get the other 4 million out of North Buckheart where it would be available for the Buckheart Mine instead of Cuba.

So, we actually didn't get what we had hoped [237] for in the Cuba Mine which we were trying to extend the life of very definitely.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. HEDLUND:

Q I show you now, Mr. Morris, what has been identified as Morris Deposition Exhibit 71, which is an excerpt from the minutes of the United Electric Board of Directors in September, 1966.

MR. HEDLUND: May we have just a moment, your Honor?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: For the record, Morris Deposition Exhibit 71 is not in evidence.

MR. HEDLUND: I have misdescribed the document that your Honor has. I am looking for it.

THE COURT: All right.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

[238] MR. HEDLUND: To save time, I would ask the reporter to mark this Defendants' Exhibit No. 228 for identification, an excerpt from the Board meeting of United Electric in September, 1966, being pages 4386 through 4389.

(The document was thereupon marked as Defendants' Exhibit 228 for identification.)

BY MR. HEDLUND:

Q Mr. Morris, I direct your attention to the second paragraph of the minutes, where it states:

(Reading) "After mining all of the coal in the present location (Green Pit), the estimated reserves at Fidelity that can be stripped is 23 million tons."

Will you please tell me, sir, on what the 23 million ton estimate was based.

A It was based on figures given me by our Engineering Department, plus what we considered potential or available to us nearby the Fidelity Mine, and subsequent to that time you can determine whether we acquired those areas.

MR. HEDLUND: Thank you.

THE COURT: Are you going into a new area now?

[239] MR. HEDLUND: Yes, your Honor, I am.

THE COURT: Then we will take a short recess.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

THE CLERK: Case on trial.

THE COURT: The witness may take the stand. You may proceed, Mr. Hedlund.

[240] Did you get some water for the witness?
THE CLERK: Yes, your Honor.
THE COURT: All right. Thank you.

BY MR. HEDLUND:

Q Mr. Morris, in this case the Government contends that United Electric's coal reserve position was adequate and improving when representatives of General Dynamics went on the Board of United Electric, and but for the interference in the affairs of United Electric by General Dynamics, United Electric would have acquired additional coal reserves.

At any time while you were president of United Electric, did Frank Nugent or any of the Material Service-Freeman-General Dynamics representatives hold back United in acquiring any additional economically mineable reserves?

A No, they did not. The contrary was true. Nugent especially, and other members of the Board, continually asked me to exert every effort to get strip reserves which the company could utilize.

Q During the time that you were president, did Frank Nugent or the Material Service-Freeman-General Dynamics representatives ever block or try to interfere in the expenditure of capital funds or [241] other necessary funds of United Electric for any worth-while business purpose?

A No, they did not. In fact, during the six or seven years I was president, our capital expenditures were extremely large and probably greater than any six-year period in the history of the company.

Q What were some of the things that the company bought in those six years?

A They bought two big stripping machines at over $3 million apiece, they bought 20, hundred ton trucks at over $125,000 apiece, they put in a heat drier, they—

Q At an approximate cost of what?

A $700,000.

They tore down and moved the wheel from Fidelity to Banner at an expense of—I will have to give you an estimate on that—$750,000 or more, and there was a lot

of other miscellaneous equipment purchased during that period.

So, our capital expenditures during that period were quite heavy.

Q While you were president, did you have to submit to General Dynamics in New York for [242] approval any capital expenditure request?

A No, I did not.

Q At the time you left United Electric, what position did Bob Donaldson have, if you recall?

A Superintendent of the Banner Mine.

Q Did Mr. Donaldson ever have any deep mining experience?

A Not that I ever heard of.

Q At 513 of the deposition of Mr. Frank Kolbe, in referring to the appraisal of Paul Weir & Company of the Banner mining properties in 1959 prior to the time the mine was opened, Mr. Kolbe said the following:

(Reading.) "He said",

Referring to Paul Weir,

"'I'll give you the value of the equipment'"

And then continuing with Mr. Kolbe,

"... and that was nuts for a mine that was going to earn $1.65 a ton"

Mr. Morris, while you were president, did the Banner Mine ever earn, either before or after taxes, $1.65 a ton?

A No, it did not.

[243] Q At page 811 of the deposition of Mr. Kolbe, he makes the following statement:

(Reading) "I might also point out that Mr. Nugent has a negative attitude and that I have a positive attitude and that makes a big difference in everything."

As a result, Mr. Morris, of your contact in business situations in the course of your presidency and before with United Electric, do you believe that Mr. Nugent has a negative attitude?

A No, I do not.

Q The Material Service-Freeman representatives were elected to the Board of United Electric in 1959. Was Mr. Kolbe in favor of their election or opposed?

A No, he was not. He was not.

Q He was not what, sir?

A He was not in favor of it.

MR. HEDLUND: Your Honor, I believe that is all I have on direct examination. The Government has indicated to me that their cross examination will go beyond the normal adjournment hour.

THE COURT: I thought they would be through in ten minutes.

• • • •

[249]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before the HON. EDWIN A. ROBSON, Judge,
Wednesday, April 1, 1970
10:40 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM.

• • • •

[256] THE COURT: Will the witness take the stand. Are you ready to proceed with the cross examination?

MR. EISEN: Yes.

JOHN M. MORRIS,

called as a witness by the defendants, having been previously duly sworn, was examined and testified further as follows:

CROSS EXAMINATION

BY MR. EISEN:

Q State your name for the record, please.

A John M. Morris.

Q You are, are you not, the same Mr. Morris who testified here yesterday?

A Yes.

Q You realize that the oath you took yesterday is still binding upon you?

A I do.

Q Mr. Morris, who proposed you for president of United Electric in 1959?

A Mr. Frank Nugent.

Q I believe you testified yesterday with regard to the merger talks between Truax-Traer and United Electric, do you recall that testimony?

A Yes, I do.

[257] Q When did these talks take place?

A I can't give you the exact date. It was around 1955, 1954, 1956, maybe a little later than that. That was the original or the first discussions that I recall.

MR. HEDLUND: Excuse me, your Honor. I am having a little difficulty hearing the witness.

THE COURT: Speak up so Mr. Hedlund and all parties can hear you.

THE WITNESS: Did you hear those dates I gave?

MR. HEDLUND: Yes.

THE COURT: You may proceed.

BY MR. EISEN:

Q You were involved in those discussions?

A Not at that time, no.

Q When did you become involved in the discussions?

A After I was made president and a committee was appointed by the Board of Directors to revive or continue the discussions, and again I am not clear as to the date of that, but it must have been about 1960 or 1961.

Q Who headed those discussions?

A Frank Nugent.

[258] Q Going back to 1955, who were the principals in the discussions at that time?

A Frank Kolbe from our company; and I forget who he was talking to at that time with Truax, but I think it was Mr. Harold Truax. But Kolbe was doing all the discussions on the first attempt from our company.

[259] Q Who were the principal shareholders of Truax-Traer at that time?

A I have no idea, Mr. Eisen.

Q When UEC was discussing a merger with Truax in 1955, UEC had not yet begun to acquire reserves in the Round Prairie of the Beaucoup Field, had they?

A No. That started, I believe, in 1956 or 1957 for Amalgamated, and then a year or two later we began to put together some lands adjacent to Amalgamated, called Round Prairie.

Q Did UEC at one time operate a coal mine in Indiana?

A Years ago, in about 1928, 1929, near Farmersburg, Indiana.

Q Do you recall the name of that mine?

A Farmersburg.

Q Is it a fact also that UEC operated a mine in, a deep mine, in Illinois in the 1920's?

A I would have no knowledge of that. Never heard of it.

Q You never heard of it?

A 1920?

Q In the 1920's.

A Never heard of it.

Q UEC has operated, has it not, over the last [260] 20

years coal mines in freight rate districts other than Belleville and Fulton-Peoria Freight Rate Districts, hasn't it?

A Yes, we have.

Q I believe you mentioned one yesterday, the Mary Moore Mine.

A That is correct.

Q Which was in the Danville Freight Rate District.

A That is correct.

Q What about the Freeburn Mine? Was that operated by United Electric?

A That was operated by United Electric and closed—oh, it's so long ago I can't tell you when, but it was in the Belleville District.

Q Did UEC have a mine at one time in the Rushville-Schuyler County area?

A We did.

Q Now what was the name of that mine?

A Rushville, I believe we called it. That closed a good many years ago, too.

Q About when would you say that closed?

A Oh, 20 years ago.

Q Did UEC also have a mine called the Skyline [261] Mine?

A Well, we put some machinery in there to work for the Island Creek Coal Company, where we were to strip the coal and truck it to their plant, and they did the processing, and they sold the coal. All our participation in it was uncovering it, and I believe we did truck it to the plant, which was—I don't know how far, but it was a few miles anyway.

So it wasn't what I would call a complete ownership or operation of a coal mine. We were doing part of the job, and they were doing the rest, and it was on their property, their coal leases.

[262] Q But it was leased property by you and you mined it, is that how it was? UEC mined it?

A We paid them a royalty for the coal. We mined it. They processed it. They charged us out of the selling price for processing and for selling and for royalty.

Q Has UEC from time to time or other strip coal operations or even other coal mines in general made

arrangements with other coal companies to lease property, and on a royalty basis, so much per ton, to mine and sell coal, the fee of which belongs to another coal company?

MR. HEDLUND: May I have that question read back, please.

THE COURT: Read the question.

(Question was read by the reporter.)

MR. HEDLUND: If Mr. Eisen is asking the witness for operations other than Skyline, I have no objection, but I am not quite clear on the thrust of the question.

BY MR. EISEN:

Q This was other than Skyline?

A I don't recall any. No.

Q Did you at one time buy some royalty coal and mine it from a company called the Morgan Coal Company?

[263] A We leased that coal from them, which is adjacent to our Banner mine, and we have not mined it yet, but that was an outright lease from the Morgan Coal Company, just the same as any lease we would make with anybody, farmer or coal producer—not a coal producer, but a coal owner. This was a piece of coal that he couldn't mine himself, that he picked up some time ago, and it is right next door to our operations. But that will be handled through our own plant, just the same as any other coal we have down there. So that doesn't compare in any way with the situation over at the Skyline.

Q Have you attempted to enter into any arrangements with other coal companies similar to the Skyline arrangement since that time?

A We never had the opportunity.

Q I say, sir, have you attempted to?

A Not that I recall.

Q Or have you approached any other coal companies with that in mind?

A Not that I recall on that kind of basis, because the Skyline thing was such a disastrous failure, I don't think we would attempt it again.

[264] It was a disastrous failure for reasons other than the legal arrangement, isn't that right?

A It was a bad deal. That's all I can tell you.

Q Was that because of the particular mining situation or because of the financial arrangement or what?

A Mining conditions, No. 1. Island Creek taking too much of a bite out of the cherry, No. 2, which is the financial arrangement. And their unwillingness to properly assign enough business to that mine to keep it operating on a profitable basis. We abandoned it finally and sold the machine.

Q Mr. Morris, you recall yesterday that counsel showed you three letters from Mr. Kolbe to various parties with regard to the interest of United Electric or the absence of interest in going into underground mining?

A I recall the letters, yes.

Q In DX-220, Mr. Kolbe wrote:

> "We are not interested in operating any coal mines except strip coal mines".

That letter was dated 1942. Do you recall that?

[265] A I don't recall it, no.

Q In 1954, the 1954 letter, which is DX-221, Mr. Kolbe wrote:

> "Inasmuch as we confine our operations to strip mining, we would not be interested in this property."

Do you recall being asked about that yesterday?

A I was asked about it, yes.

Q In the 1956 letter does Mr. Kolbe state that UEC is not interested in deep mining, and for that purpose I am going to show you what has been received in evidence as Defendants' Exhibit 222.

A May I ask is that a different letter than I was shown yesterday or in addition to what I was shown?

Q This is the third letter.

A One of the same letters?

Q You were shown three letters, and this is the third one.

MR. HEDLUND: Is there a question pending?

MR. EISEN: I think there is.

THE COURT: Read the question.

Q (Read by the Reporter.)

MR. HEDLUND: Your Honor, I think the letter [266] speaks for itself.

BY THE WITNESS:

A It states what it is. Do you want me to read it?

BY MR. EISEN:

Q He doesn't say UEC is not interested in deep mining?

A He says we are not considering mining deep coal at the present time, which is not exactly what he said in the previous letters, but he didn't go into any kind of arrangement with these people or even consider it at that time.

* * * *

[270] Q Was it Kolbe's idea to use the Colmol at the Buffalo Creek Mine?

A Whatever was put down there in the way of attempting to mine additional coal or increase production was his idea. He was in charge then, and he was looking for ways to produce more coal out of that property. So, whatever was done, it was at his suggestion.

Q So that at least to that extent, Mr. Kolbe was interested in underground mining?

A To that extent, yes.

Q To the extent that Mr. Kolbe first arranged for the acquisition of the Beaucoup property, that would also be an expression of interest in underground mining, would it not?

A I wouldn't think so because that was done at the request of Amalgamated for long range planning considerably beyond even the life of Fidelity and other properties down there. So, it was done at the request of a customer.

Q Would you surprised if Amalgamated stated that they planned to have that property mined in the 1970's?

A I have had no way, would have no way of [271] knowing anything about it because I haven't been around for the last four years. At the time I left, they did not indicate they were going to do anything very soon. I don't know what happened since then.

MR. HEDLUND: I am sorry to interrupt, your Hon-

or, but I am having a great deal of difficulty hearing Mr. Morris.

THE COURT: Would you speak up a little louder, Mr. Morris.

THE WITNESS: I am trying to speak as loud as I can.

THE COURT: All right. Maybe if you sit on the other side of the table you can hear better, Mr. Hedlund.

MR. HEDLUND: All right, your Honor.

BY MR. EISEN:

Q It is quite possible, is it not, that conditions have changed since you became inactive, and the feasibility of mining a property such as Beaucoup has become more appropriate?

A That I would have no way of knowing.

Q Following the closing of the Buffalo Creek Mine, United Electric retained the reserves at this mine, did it not?

[272] A The contract we had with Mr. Potter from whom we leased that coal—I will have to give you this from memory. I can't be too positive of it— but, I think the records will show, our leases will show, that if we abandoned and discontinued in there, anything that was left reverted to him. But, I would like to refresh my memory with the documents themselves, but I'm rather sure that the unmined coal, if any, unmined strip coal, reverted to—his company was called Kentucky Store & Land Company, I believe was the name of the corporation that we leased from.

MR. EISEN: Will counsel stipulate that the Buffalo Creek reserves were retained by United Electric until 1967, at which time defendants asked the Government permission to sell the Buffalo Creek reserves?

THE WITNESS: Mr. Eisen, may I answer—

MR. EISEN: No, there is no question, Mr. Morris.

THE WITNESS: All right.

MR. HEDLUND: May I have the request for stipulation read back, please?

MR. EISEN: That the—

MR. HEDLUND: Are you going to change it, Mr. Eisen?

• • • •

[301] Q Could you tell us the substance of the last conversation you had before going to Pittsburgh?
[302] A Yes, I can tell you.
Q Please do.
A I told Mr. Nugent, No. 1, that there was a possibility of maybe interesting Illinois Power in the mine mouth plant, and I had never met the Amalgamated people, I don't believe, up to that time, and I was going down there to see them and find out if they would let us dedicate some part of their reserves to a new coal mine for Illinois Power, which we would put with our Round Prairie Field and make a sizeable backlog for a coal mine, and also I undoubtedly in the conversation talked about Freeman doing the mining or Freeman loaning us the people to determine what the feasibility study would be, and that I was going to tell the Amalgamated people of Freeman's interest in our company.
That is as near as I can recall what was about the gist of the conversation.
Q This conversation would have had to have been when you were president of the company?
A Yes.
Q You became president in—
A '59.
Q In October of '59, is that correct?
[303] A Yes. November of '59, I believe.
Q In your conversation down at Amalgamated in Pittsburgh, you did not say anything to them about Freeman, did you?
A Yes, I did.
Q Do you recall that your deposition was taken on October 1, 1968 and you were questioned about these matters?
A Yes, I do.
[304] Q Do you recall what your testimony was with regard to whether or not you mentioned that Freeman was connected with the possible utilization of those reserves for Illinois Power?
A I don't remember specifically what I said at that time in that deposition, no.
Q Do you think maybe you didn't recall it at the time on that deposition but now it comes to mind?

MR. HEDLUND: I object. I think Mr. Eisen is arguing with the witness. If he wants to call attention to a particular—

THE COURT: The objection is sustained. Cite the deposition.

BY MR. EISEN:

Q I would like to refer you, Mr. Morris, for the purpose of refreshing your recollection, and with the permission of the Court I will not read the testimony but will hand it to the witness, because it is about a page and a half—

THE COURT: Indicate the page.

BY MR. EISEN:

Q Beginning at the bottom of page 266 and onto page 267.

See if that refreshes your recollection as [305] to the subjects that were mentioned at that Pittsburgh meeting.

MR. HEDLUND: Is there a question pending?

THE COURT: He just asked him to read.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY THE WITNESS:

A That is about the way I have stated it here.

MR. HEDLUND: I don't believe there is a question pending.

MR. EISEN: I asked him if it refreshed his recollection.

THE COURT: There was no question pending.

Do you have a question now?

BY MR. EISEN:

Q Does that refresh your recollection, Mr. Morris, as to whether or not you told Mr. Miller, I believe was his name, at Amalgamated that it would be Freeman who would be utilizing or who would develop those reserves?

A At the time you took my deposition you did not ask me whether I did that or not, and I didn't state it

in that answer. You are now asking me if I told him, [306] and I am quite sure I did, because I told everybody I was discussing any underground proposition with that we would have to utilize the ability and knowledge of Freeman, with whom we were closely associated, if we went into any underground mining.

* * * *

[308] Q Is it possible that you began your conversations with Mr. Kraakevich of Illinois Power with regard to their planning a mine-mouth Plant in the Beaucoup area as late as 1963?

A I think it was earlier than that. But the records, again, are the best positive answer to that question.

Q What record are you referring to now, sir?

A Letters that we wrote to Mr. Kraakevich about the project principally. But let me say this: [309] before we got into it very thoroughly with him or very seriously, they made their decision to build a plant, an extra unit, I mean, at Wood River, and this whole proposition just was stopped or fell of its own weight. It wasn't pursued any further.

[310] Q Are you positive, Mr. Morris, that the conversation with Mr. Kraakevich in 1959 was where you proposed to supply coal to Illinois Power for a mine-mouth generating plant to be operated by Freeman?

A I can't tell you the exact date or year. I have given it to you as closely as I remember it, and that is the best I can do.

Q Isn't it a fact that in your initial conversation with Mr. Kraakevich you didn't mention Freeman?

A I am quite sure I mentioned Freeman soon after I became president, which is the time they came on the Board.

Q Isn't it a fact, Mr. Morris, that from 1955 to 1959 you called on Mr. Kraakevich on numerous occasions?

A That is correct.

Q Isn't it also true that you told Mr. Kraakevich during this period that Freeman had nothing at all to do with United Electric?

A I did not tell him that, because it was a matter of public information that they had a sizable interest in our

company, and I certainly wouldn't deny that they didn't have a financial interest. So far as having anyone on the Board prior to 1959, that was a [311] matter of public record, too. But I don't know what I told him in 1955 to 1959.

* * * *

[314] BY MR. EISEN:

Q Showing you what has ben identified as GX-107 for identification, Mr. Morris, can you tell us approximately how much coal is underlain in what is known as the Round Prairie Field, based on the checkerboarding as previously described?

A I would like to know, if you will tell me, from your records there, what our engineering reports showed that we carried at the end of 1966 or 1965, whenever you have it there. I think it was around 50 million, but I am not sure. I would like to have that, though, if I am permitted to have it, your Honor.

BY MR. EISEN:

Q Would that help you?

A That would help me. This map is December 31, 1966.

MR. HEDLUND: I have the record here, your Honor.

THE COURT: All right.

BY THE WITNESS:

A I don't need to look at it. All I need to know is the figures.

MR. HEDLUND: Here it is (tendering document).

THE COURT: Mr. Eisen, what is the purpose of [315] this examination if it is all a matter of record?

MR. EISEN: It is not a matter of record, your Honor. My next question will indicate to the Court why it is not a matter of record.

THE COURT: All right.

[316] BY THE WITNESS:

A I think I am prepared to answer the question now. That record showed a total of 43 million tons as of December 31, 1966, covered by these colored portions of this map, which is checkerboarded and which is fairly solid in the central part.

On the basis of that, my best estimate would be there is another 40 or 50 million tons in that area, maybe 80 or 90 million tons total in this area that we were working.

Q As referred to on GX-107 for identification?

A Is that what that is?

Q Yes.

A Yes.

MR. EISEN: The Government offers into evidence GX-107 for identification.

THE COURT: Is there any objection?

MR. HEDLUND: Your Honor, this is the first time I have ever seen this map, recently.

THE COURT: Was that submitted to the defendants before?

MR. HEDLUND: It was not.

MR. EISEN: It was not, and I have to apologize, [317] your Honor. Of course, it is their map. I have to apologize. I didn't plan really to use this today. As I was coming into the courtroom, I saw Mr. Cusack had a copy of it. So I apologize. I gave them a list of everything I thought I would use.

THE COURT: All right.

MR. HEDLUND: Your Honor, I have no particular objection.

THE COURT: It may be admitted.

(Whereupon, GX-107 was received into evidence.)

BY MR. EISEN:

Q Would you explain, Mr. Morris, what is meant by the expression, "control by location"?

A Yes. That means you have a block of coal in one particular area. Anything close by or surrounding it or within a reasonable distance, if you have a fairly good block, would mean you would undoubtedly be the best qualified to take up the rest of it and put it into a sufficient tonnage set-up to justify a coal mine.

Q This is a practice of coal companies generally?

A It is.

Q Or at least some coal companies?

A That is correct, yes.

[318] Q And it was on that basis that you answered the prior question that I put to you with regard to GX-107?

A That is correct, yes.

Q So that the 40 million tons remaining in the area would be controlled by location?

A I think so, yes.

MR. EISEN: I am getting into another subject, your Honor.

* * * *

[320]

AFTERNOON SESSION 2:00 P.M.

* * * *

LOUIS R. TOMEY,

called as a witness on behalf of the defendants herein, having been first duly sworn, was examined and testified as follows:

[321]

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name and address, sir.

A Louis R. Tomey, 838 Warwick Lane, Glendale, Missouri.

THE COURT: Will you spell your last name.

THE WITNESS: T-o-m-e-y.

THE COURT: Thank you.

That is not an amplifier, sir. It is merely for the tape recorder so it will not help your voice. Keep your voice up so all counsel can hear you.

THE WITNESS: Thank you, sir.

THE COURT: Thank you.

BY MR. KEMPF:

Q By whom are you employed, Mr. Tomey?

A Union Electric Company.

Q What is your business address?

A 1901 Gratiot Street, St. Louis, Missouri.

Q What position do you hold with Union Electric?

A I'm responsible for the purchasing program, the motor transportation section, the stores section and the building service, and the title is Superintendent of Supply Service.

[322] Q How long have you been with Union Electric Company, Mr. Tomey?

A 33 years, and during that time I've had a number of jobs with the company, and assumed the job as purchasing agent in '59 and the present job in '66.

Q While you have been with Union Electric, have you personally been involved in the purchasing of the company's coal requirements?

A I have, and, in fact, I have been involved in their coal program since about 1949.

Q I am sorry.

THE COURT: What year?

THE WITNESS: 1949.

THE COURT: All right. Thank you.

BY MR. KEMPF:

Q I would like to show you what has been received in evidence as Defendants' Exhibit 144, a map entitled "Investor-Owned Electric Utility Service Areas." Could you show us on this map here the service areas of Union Electric Company. Preliminarily, where are those service areas generally located?

A Well, we serve the northern portion of Missouri, and through our subsidiaries, it goes to Iowa and comes down to St. Louis and then over out into the state [323] as far as Jefferson City and the central area of Missouri.

Q Could you show us specifically on the map the service areas served by Union Electric Company and its subsidiaries?

A The Union Electric has the 151 area, the subsidiary 90 is Missouri, is our Missouri Edison, I believe, and 91 is the Missouri Power & Light area. It's the brown area.

Q By the numbers, you are referring to the numbers on Defendants' Exhibit 144?

A Yes. The color, I guess this is bronze and the dark brown there.

MR. KEMPF: Thank you.

BY MR. KEMPF:

Q Could you describe briefly the electrical generating facilities which Union Electric operates, Mr. Tomey.

A We have, upon the completion of our Labadie Plant, which is now under construction, and the last or the fourth unit will go in service in 1973, we will have then seven steam plants. We have two internal combustion engine plants, two hydroelectric plants and a pumped hydro plant.

[324] Q What is the approximate electrical generating capability of your company upon the completion of the Labadie Plant you referred to?

A Approximately 6 million kilowatts.

[325] Q What fuel is used by Union Electric at its two internal combustion engine plants?

A One plant uses natural gas, and one plant uses oil.

Q What fuel is used by Union Electric at its seven steam power plants?

A Principally coal is used at our steam plants. However, in recent years we have started using considerable amounts of oil and natural gas during the summer time when we are able to obtain interruptible gas.

Q Why is that?

A Well, with the air pollution regulations such that we are having to burn more and more gas during the summer time, and at our Cahokia plant we have gone to oil for the same reason, to eliminate the fly ash from the stacks.

Q Do you have under consideration at the present time any increased use of either oil or gas?

A I am sure as the air pollution regulations become more stringent, we will have to go further into oil at our plants that are in the immediate vicinity of the St. Louis area.

[326] Q Does Union Electric operate any nuclear powered generating stations?

A No, we do not at the present time. However, we have been abreast of the developments in nuclear, but at the present time we do not operate—we do not have a nuclear contract.

Q Do you anticipate the possibility of any nuclear plants in the future?

A Well, I would think by the end of this decade we probably would be in that position, yes.

Q I now hand you Defendants' Exhibit 146, a 1966 annual report of Union Electric Company. I would like to refer you to page 8 thereof.

A This annual report, of course, calls attention to our—

THE COURT: I don't believe we have a question pending.

BY MR. KEMPF:

Q My question is: I think this traces, does it not, the nuclear interest of Union Electric through the years starting the bottom of the first column on page 8?

A Among other things, yes, it covers our annual reports analysis of what we have done in nuclear energy. And it indicates about what I said a while ago, the fact [327] that we have tried to stay abreast of the nuclear developments. This goes back clear to 1951, when we went, together with Monsanto Chemical, in this nuclear power group, and it ended up with an initial 200,000 kilowatt station at Dresden, and we are continuing to stay in touch with the nuclear situation. But, for us, it hasn't become economical as yet.

Q Mr. Tomey, I now would like to show you what has been received into evidence as Defendants' Exhibit 147, the 1967 annual report of Union Electric Company, and I would like to refer you to page 13 thereof.

The last paragraph on the right-hand column again refers, does it not, to Union Electric's interest in nuclear power?

A Yes.

MR. FUTTERMAN: Your Honor, if I may, I should like to object to that question on the ground that the document speaks for itself.

THE COURT: Well, I assume the witness is not going to read the document. We will hear what he has to say. I will consider a motion to strike if necessary.

BY THE WITNESS:

A Well, it just indicates further our staying abreast. The fact of the matter is we engaged, as this [328] report says, NUS to make a study for us back in 1966, and it just substantiates our still staying with coal when this decision was made.

[329] Q I would now like to show you Defendants' Exhibit 148, the 1968 annual report of Union Electric Company, and I refer you to page 6 thereof.

Again looking at page 6 of the 1968 annual report, this particular portion of the annual report traces, does it not, the Union Electric interest in nuclear power?

A Yes, it does. It reports to our stockholders that we now have gone in with several other utilities, with Gulf General Atomic, on the development of a fast breeder reactor, and a continuing of our efforts to stay abreast of the nuclear field.

Q Mr. Tomey, I now would like to show you Government Exhibits 88 through 90 and 96, and I would ask the Government to provide the Court with a copy of these items.

I will ask you to turn to page—it is not numbered, but it is the third page in on Government Exhibit 88. That page has as the third entry in the far left-hand column "Union Electric Company, St. Louis, Missouri." Do you see that? The third page in.

A Yes. The third customer down?

Q The third customer down.

[330] A Yes, sir.

Q If you will take Government Exhibit 89, the last page, the top customer listed is Union Electric Company, St. Louis, Missouri. My copy of this is somewhat blurred, but I think the Government will stipulate that is "Union Electric Company".

MR. FUTTERMAN: We so stipulate.

BY MR. KEMPF:

Q On Government Exhibit 90, again the final page, the top customer, as it is shown on mine, it agains refers to Union Electric, and if you will look at Government Exhibit 96, it likewise reflects shipments to the Meramec and Venice Stations of Union Electric by Freeman and United Electric.

All of these exhibits indicate that you have in the past bought coal for your Venice and Meramec facilities from both Freeman and United Electric.

If Freeman and United Electric were independent companies, would they compete against each other for the business of those facilities?

A Well, the coal under these contracts is different. The Freeman contract is dust coal, and the United coal is screenings. Really it is not a competitive situation there.

[331] Q Why is that?

A Well, the dust is a byproduct of the metallurgical field, and there is only a limited amount of that available, and we have been able to utilize that in our boilers due to the economics of the situation, and we can only use about 50 percent of it, however, in our boilers and we have to mix it with the screenings. So, you are really not talking about two competitive situations here. One is on the screenings and one is on the dust.

Q Why is it that the dust is not able to compete with the screenings at these particular facilities of Union Electric?

A Well, the plants are located on the Mississippi River, which is right adjacent to the Belleville coal fields, and whereby the dust shipments are coming from the Southern Illinois fields, and there is quite a rail haul into there, and, unless the price of the dust is—and that is one of the things that makes it attractive. The price is low enough so that it could compete with the screenings for those particular—that particular fuel, or it made it attractive up to a certain portion, whatever you can burn.

Q For the portion that you burn of dust, who [332] competes for that business?

A Well, the metallurgical people, the people who have metallurgical coal, I should say, in the Southern Illinois fields, that produce offal or the byproduct of the metallurgical coal, which is the dust.

Q Who competes for the screenings portions of these plants' requirements to which you referred?

A The people who are mining in the Belleville district, the major mining concerns in the Belleville coal fields are competing for that business.

Q Is this true of all of your plants?

A No, it's not true of all of our plants. The Sioux Plant is on the Q Railroad, and that generates considerable—they service a lot of mines in Southern Illinois fields, and that puts a competitive situation as far as our Sioux Plant is concerned with the southern producers, Southern Illinois producers, and the Belleville people are a little—we don't even have barge facilities in our Sioux Plant, and that would be their competitive situation, by going into the Sioux Plant by barge.

As far as the other plants, the air pollution is making it such that we are going to have to shift some [333] of our plants that are nearest St. Louis from the Belleville fields into low sulphur producers, and low sulphur coal, which will make the Belleville people less and less attractive, Belleville coal, less and less attractive, at those plants.

Q What procedures are followed by Union Electric in purchasing coal for its facilities?

A Well, more and more of our coal is getting into long-term contracts. The fact of the matter, about 90 percent of our coal is under long-term contracts right at the present time.

[334] Q Of how long a duration would the Union Electric contracts be?

A Our contracts for long-term coal have been tied with the new plants and, of course, with the large outlay of money for a new plant, you want to assure yourself of a pretty solid coal supply for certainly the most productive years of that plant, which would be 15 to 20 years with options to renew for possibly another ten.

So, our long-term contracts are running between 10 and 15 years with options to renew.

Q Are there any other factors that enter into the length of these contracts?

A Well, yes, there is a factor such as the efficiency of your equipment. If you are assured of a long-term supply of coal with one type of coal, you can increase, you can design your boiler more closely for that particular fuel which, in turn, increases its efficiency, and over the most productive years of the plant it is quite advantageous to have such a long-term supply.

Q How wide a range in the specifications governing coal which is acceptable for use in your boilers does Union Electric have, Mr. Tomey?

[335] A That varies from plant to plant there. Most of the older plants have a wider variation in their boilers than the newer plants, and our cyclone boilers particularly have a very narrow range, at our Sioux Plant have a very narrow range, and the Merrimac and Venice Plants are able to use a wider range of coal. So, I would say that varies with the plant.

Q Would Union Electric be able to use coal from the Fulton-Peoria area in its boilers?

A Well, we've never had to face that one because the freight in there would make them real non-competitive as far as we are concerned from that area into St. Louis, and we have never had to face that. But, I assume that coal has a different ash characteristic, which I believe is higher than ours, and also the moisture, and that would certainly, on our boilers could certainly wreck their efficiency and could cause them to slag up and maybe even shut them down if you had the type—if it got too severe.

Q Apart from coal specifications, what other factors does Union Electric look to when considering potential coal suppliers, Mr. Tomey?

A Well, certainly you have to have a company that has large reserves in order to participate, and [336] to participate in a company that has large generating units, and the sound financial condition of a company would be a consideration, and I would say also a very im-

portant one would be experience, their experience in the field of actual mining.

Q Why are adequate coal reserves a factor?

A Well, there again it goes back to your outlaying—you are putting out three or four hundred million dollars for a plant, and you want to be assured of solid supply of fuel for that particular plant, and so reserves become very, very important.

[337] Q Do you inquire directly of this of the coal producers when you begin negotiations with them?

A Well, our letter of invitation to bid, that's one of the things that brings out what are the reserves that you have available for dedication to this contract. Also, the characteristics of the coal along with where the site is going to be and the mine site, what railroad it serves and its capacity. So, all those are part and parcel of negotiating a coal contract, and that's a very important one.

Q Do you have any minimum number of tons which you consider essential for dedication to a facility if a coal producer is to bid on one of your coal contracts?

A Well, that, of course, is tied to the size of the unit and, of course, our units have been sized for the past, I guess, 10 years, or the coal contracts since about the middle of 1960 have been running between 1.5 to almost 2 million tons a year per unit, so if you can multiply the arithmetic out, you get some place between 30 and 40 million tons of reserve required for a couple of units that you would be contracting for.

Q What about these other factors you mentioned? I think you mentioned the financial foundation and their past performance I think you referred to. Why are those [338] important factors?

A Well, I guess it all goes back to the same situation. You are into a large project and you want to know that the people you sign a contract with are able to produce on their end of it, and that takes substantial amounts of money to open up a coal mine, and you have to have a—your contract has to be with people who are substantially able to handle such a financial undertaking.

Q Is the number of coal companies serving Union

Electric with good financial and management teams greater, smaller or about the same as it was when you first became active in coal purchasing?

A Well, it appears to me that we have a lot of people still interested in our business, and I would say that there is still considerable competition in our business, and I can't see a great deal of diminution in it, really. [339] Q My question is as to the number of people who combine these factors that you refer to, the good financial background and good management team, just in terms of the number of people who are now serving Union Electric. Are there more or less or about the same as when you first became active—

MR. FUTTERMAN: I object to the question on the ground it is leading.

THE COURT: Objection overruled. You may answer.

BY THE WITNESS:

A I would say it would appear to me about the same. We will still have considerable numbers of people interested in our business.

BY MR. KEMPF:

Q With the companies to which you are referring, how important to you is their flexibility in fulfilling their contract requirements, if at all?

A I would say it is extremely important to have flexibility in the coal supply. As a case in point—

Q What is that?

A Just recently, when one of our large suppliers had a disaster, a plant actually having a million ton contract to our plant went out of service. It was [340] going to be out of service initially for three months. That was the indication. A lot of herculean effort went into it on their part, and they were able to get it back in six weeks. But during that period of time they were able to supply coal to us from another mine that they were operating. It certainly helped out a great deal as far as our supply was concerned.

Q Now you also referred to this factor of reliability

of service, Mr. Tomey. Suppose a company like United Electric, standing alone and without affiliation with Freeman, were to come in and tell you that they would like to submit a bid on a particular plant of yours to be serviced by an underground mine which they proposed to open. What would your reaction be?

A They would be at a considerable competitive advantage opening up an underground mine from an experience level, unless they made you an offer that would just be untenable or just couldn't be passed up. Unless you were willing to take such a risk. That certainly is not one that I would want to recommend that you take. However, you certainly would have to look at it very, very carefully before you would just immediately jump into a long-term contract with someone [341] that is just getting initially into the business, who had no experience in that type of mining.

[342] Q I am not sure I heard something you said in the beginning. Did you say that they would be at a competitive advantage or disadvantage?

A I said they would be at a great competitive disadvantage. Maybe I did say "advantage."

Q Does the electricity which is generated by Union Electric face competition in its end uses from other fuels?

A It sure does. We have considerable competition from the gas industry, particularly now with the total energy concept just being promoted and developed in the gas industry. In fact, here again, another case I could cite—the largest office building which just opened in St. Louis recently—and I am talking about very recently—is a total energy building. The illumination as well as all the facilities are generated on site. That is the third unit we have in the St. Louis area presently. So we have plenty of competition from the gas industry. And, of course, you are in competition for electric heat for heating with the oil industry.

Q What effect, if any, does the common ownership of Freeman and United Electric by General Dynamics have on competition for the business of Union Electric Company?

[343] A I haven't noted any particular disadvantage at the present time or since they have been operating together. The fact of the matter is there could be, I would think, some advantages by having larger reserves, that they would be able to fill out some longer term contracts with maybe Freeman's reserves, United Electric being a reserve short company.

MR. KEMPF: I have no further questions at the present time.

THE COURT: You may cross examine.

[344] CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mr. Tomey, isn't it a fact that Union Electric can purchase only interruptible gas?

A In large quantities, that is correct.

Q And the interruptible gas which Union Electric purchases is only available from about May to October, is that correct?

A April 1 to October 1, yes, sir.

Q Why is interruptible gas unavailable November to about April 1st?

A I guess it has to do with the pipeline capacity into St. Louis, and the fact that it is being utilized by the heating customer, the home heating customer, and for industrial heating in the area.

Q Isn't it a fact that the gas company can sell gas in the home heating market at a greater profit than it can realize on sales of interruptible gas to electric utilities?

A The price is higher, yes. I don't know about their net.

Q Mr. Tomey, isn't it a fact that the cost of interruptible gas to Union Electric has increased from about 18½ cents to 30 cents per million BTU [345] during the past few years?

A As to "few years", I would like very much to put a number on that "few". I think it is over the past eight, nine years. If that is "few", you are entirely correct.

Q And the current cost of coal to Union Electric per million BTU is about 24 cents, is that correct?

A I believe our over-all average is around 24 cents presently. That is correct.

Q Is firm rate gas available to Union Electric in sufficient quantities to generate electricity for all of its stations?

A No.

Q If firm rate gas were available to Union Electric, it would cost about 50 cents per million BTU, would it not?

A We are buying some gas beyond the interruptible for boiler start-up over a short period of time, and this is around 50 cents, yes, sir.

Q Would you please explain what "boiler start-up" means?

A When you start a boiler up being cold, you have to bring it up to a certain temperature in order [346] to sustain the combustion of pulverized fuel, or coal, in the boiler. So they bring this up with gas, and you get the boiler heated internally with gas and also keep the gas flame on until you have continuous combustion inside the furnace with the pulverized fuel or the ground-up fuel like you use in a cyclone boiler.

[347] Q At the point where you would bring the boiler to the desired temperature, would you then cease to use gas?

A Correct. That is correct. I might say that we do, when gas is not available, do that with propane gas now. We have propane facilities for doing that same thing. But we prefer natural gas, if we can get it, because it is more economical than propane.

Q How much does the propane gas cost on a per million BTU basis?

A About $1.25 per million BTU.

Q Is it a fair statement, then, that when you are using the natural gas or the propane gas to start the boiler, you are not using that gas for purposes of generating electricity?

A That is correct.

A At the present time, Mr. Tomey, gas consumption

accounts for approximately 8 percent of Union Electric's total fuel consumption, does it not?

A At the present time—I cannot answer that precisely as to percentage. I know that it is increasing due to the fact that we are having to burn more gas due to an air pollution condition in the plants contiguous to the St. Louis area. We have increased last summer our [348] gas consumption, and this year we still plan to increase it even further.

* * * *

[355] Q Is it a fact, then, that oil is not price competitive with coal for purposes of generating electricity within the Union Electric system?

A That's right. There are other considerations than price in a situation like that.

Q I believe you testified on direct examination that Union Electric has no nuclear plants at the present time?

A That's correct, yes.

Q Do you have any plans at the present time to construct any nuclear plants?

A No, we do not have.

Q Is it not a fact that Union Electric's next plant expansion will involve coal-fired units?

A The generation that we have bought for 1975 and '76 in-service dates contemplates using coal, that's correct. The steam generation equipment has not been purchased, however, for that equipment.

Q Do you have any idea how long it would take to build a nuclear plant?

A Well, according to the records, it must be running about eight years now. The track records of [356] some of these people might be even longer than that. But, I guess if everything worked just right, you could probably do it in less time than that, but there seems to be licensing and permits and things of that nature that contemplates a longer time than a fossil fuel plant.

Q How long would it take to build a fossil fuel plant?

A Well, we're contemplating starting construction next year on this site. That's early '71, and we expect that unit to go in service in January 1, of 1975.

Q So, it would take about four years?

A Roughly four years to open up the site. Now, if you don't open up a new site, it could take less than that, but this is starting from scratch on a new one, and I'd say between four and five years is about what our record has been over the last three plants, three major plants.

Q Has your continued interest in the developments in the nuclear power field made you aware of the fact that there have been delays in the construction of nuclear power plants?

MR. KEMPF: I am sorry, your Honor. I could not [357] hear the question.

THE COURT: Will you read the question, please.

Q (Read by the Reporter.)

THE COURT: Will you speak up a little louder, Mr. Futterman.

MR. FUTTERMAN: Yes, your Honor.

BY THE WITNESS:

A Oh, I think anybody that reads the technical journals and the papers, you are made aware that there has been a large number of delays in the nuclear field, that's correct.

Q There have been other problems, such as thermal pollution involved with the construction of nuclear plants, have there not?

A Oh, I believe there has been some argument with the conservation people and the regulatory people about increasing the temperature of the water unduly, yes. I believe that's correct.

[358] Q Mr. Tomey, approximately how much money will be expended for the generating units to come on line in 1975 and 1976?

A I would say, and you have to take a real—I would want it to be a real wild guess because of the fact that with all the increases in cost that we are experiencing and have experienced for the last years, that it would be somewhere around 200 or 225 million dollars.

Q Do you have any idea of what the approximate cost would be for nuclear size units of equivalent size?

A I do not, I do not.

Q Is it not a fact, Mr. Tomey, that the plants which will come on line in 1975 and 1976, the coal-fired plants, will incorporate some kind of a sulphur dioxide emission control system?

A I don't believe that's established at this particular time for the reason that right now there is no commercially available sulphur removal system on the market, and our company, as you well know, has expended some in excess of 1.5 million dollars on an experimental unit, and right now that's not commercially operable, and we cannot say with any certainty that a sulphur removal system will be available.

I will say this, that anything that we construct will comply with the air regulations. Whether it is utilizing low sulphur oil, low sulphur coal, why, that has yet to be determined.

Q The air pollution technique that you just spoke of, that is the Combustion Engineering limestone injection wet scrubbing sulphur dioxide control system, is it not?

A That's the one we have an experimental installation on, yes, sir.

Q As I understand it, you have expended in excess of a million dollars on that particular system?

A That's correct. That's right.

Q You are continuing to experiment with that system?

A That is correct.

MR. FUTTERMAN: Excuse me one minute, your Honor.

THE COURT: Certainly.

(There was a short interruption, after which the following further proceedings were had herein to-wit:)

BY MR. FUTTERMAN:

Q Mr. Tomey, in your opinion, do you expect that there will be a commercial sulphur dioxide emission [360] control system available by 1975 and 1976?

A My personal opinion is there will not be.

Q What is that opinion based on?

A Our experience with the one that we have, and

the experience with the others—the stage of the art with the other sulphur removal systems that are being worked on around the country.

Q Have you on occasion consulted with any of the officials of the Kansas Power & Light Company?

A Our people have looked over that installation, yes.

Q You know that the Kansas Power & Light Company is constructing a 430 megawatt plant which will incorporate the Combustion Engineering SO_x removal system, is that correct?

A I was not aware of that, myself, personally. I was not aware of that, no.

Q Mr. Tomey, is it not a fact that at the present time nuclear energy is not cost competitive with coal for the purposes of generating electricity within the Union Electric system?

A The analysis that was made by NUS as alluded to in our annual report indicated that it was not economically at that particular time.

• • • •

[367] BY MR. FUTTERMAN:

Q Is it a fair statement, Mr. Tomey, that a boiler can be designed to burn a variety of coals?

A Well, if you're willing to accept the degradation in efficiency and the increase in the cost.

Q This range can include both raw and washed coals, is that correct?

A If you are willing to accept those parameters, yes.

Q You testified, I believe, on direct examination that Union Electric has not ever purchased Fulton County coal. Is this because you can satisfy your requirements from the Belleville and Southern districts within Illinois?

A Well, as I believe I stated in that, due to the economics we had never had to face that problem, and because those coals from those areas were not offered to us at a competitive price.

• • • •

[370] BY MR. FUTTERMAN:

Q But there were occasions where you did not receive the full tonnage specified—

A To answer your question directly, yes, you are correct.

Q In order to make up that difference, you had to go out and purchase coal from another source, is that correct?

A We went into our inventory situation and depleted considerably our inventory of coal, yes.

Q How did you replenish the inventory that you had depleted?

A Well, it is being replaced now. When the up river movements are ceased, then we are able to replenish our inventory somewhat.

Q Aren't there occasions when you have to go out into the spot market and purchase coal?

A Oh, yes, sure.

Q Will you explain what the spot market for coal purchases is?

A What we term a spot market is something that is not covered on a long term contract. We have contracts of 10, 15-years duration, and we have coal on a yearly basis. Our tendency is to call the coal on a yearly basis somewhat of a spot market. Also I guess [371] some people would classify as a spot market whenever you want coal next week and somebody has 10,000 tons or 50,000 tons that they can sell you on a month basis. But our tendency is to call a spot market anything that is not covered on a long-term contract.

Q When these occasions arise, specifically the one you just mentioned, from time to time does the coal originate from different producers, different locations?

A Sure. Outside your regular producers. But it is usually in your normal area, with the people who are those you may not be doing business with at that particular time, who would have the coal available, but it is in your area, the area you normally would be operating in.

Q Mr. Tomey, isn't it a fact that Union Electric

invited UEC to bid on the contracts for the Labadie 1 and 2 units?

A I do not know. I cannot answer that directly, because I did not purchase the coal for the 1 and 2 units, and I did not review that file before coming here today. I do know they did not ask them to bid on 3 and 4 units.

Q Isn't that because UEC told Union Electric [372] that it did not have the reserves to bid on the 1 and 2 units?

A It was my understanding that they told Union Electric that they did not have the coal reserves to bid on that plant, that is correct. The fact of the matter is it was my impression that they told them that on the Sioux units 1 and 2.

Q When did United Electric tell Union Electric that they did not have sufficient reserves to bid on these coal generating stations?

A I assume that was in 1962 or 1963, somewhere around there, I guess.

[373] Q Who got the contract to supply the Sioux Plant?

A The Sioux Plant?

Q Yes.

A Well, Old Ben Coal Company got the unit, the first unit, and then the second unit for Sioux is covered partially by Old Ben and partially by Freeman Coal Company.

Q Mr. Tomey, did United Electric ever offer to supply coal to Union Electric from the McDonough-Schuyler County area?

A You would have to identify those areas for me. I am not that well acquainted with the area to know. The only mine that I have been offered coal from for United Electric was out of the area of their Fidelity Mine. Is that in those counties? I think it is not, but it could be. I don't know.

Q The McDonough-Schuyler County area depicted in Nugent Deposition Exhibit 38, which has been received in evidence, is over in this general vicinity (indicating).

A They did not offer it to me, no.

Q Has United Electric ever offered to supply coal to

Union Electric from other reserves in the [374] Perry County area—that is, reserves other than those associated with the Fidelity Mine?

A We have a contract now at our Meramec Plant for United Electric there and Consolidated Coal, the old Truax-Traer company, participated in the contract. It is almost eight or nine hundred thousand tons a year, which United Electric, I believe, has around 250,000 of. That contract runs out next year. We have extended the United Electric portion of that, and they have offered to cover the latter part of the ten-year contract by other reserves of other areas.

Q What areas are those?

A It is contiguous to their present field there at Fidelity, which I assume is some of Freeman's reserves.

Q Has United Electric ever offered to supply Union Electric with coal from virgin reserves in the Perry County area?

A Not to my knowledge.

[375] Q Mr. Tomey, isn't it a fact that the new Federal Mine Safety legislation will increase operating costs of deep mines?

MR. KEMPF: I am going to object to this, your Honor. This is outside the scope of my direct examination. I did not go into the cost of the mining operations of underground mines.

THE COURT: What is the purpose of this? I do not recall anything about mining costs.

MR. FUTTERMAN: I will withdraw that question.

THE COURT: How much longer is your cross examination? I am not attempting to cut you off.

MR. FUTTERMAN: Your Honor, this is the first witness I have ever examined in a courtroom, and it is very difficult for me to estimate how long it will be. I would estimate, however, that I have a good hour left with this witness.

THE COURT: All right. We will take a five-minute recess. You are doing very well.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

THE COURT: Are you ready to proceed?
MR. FUTTERMAN: Yes, your Honor.
[376] THE COURT: You may.

BY MR. FUTTERMAN:

Q Mr. Tomey, isn't it a fact that the price of dust is determined by its BTU content?

A Well, initially I think it was determined by the competitive market situation for—oh, I would say from a relative standpoint, yes. If a dust has the same as high BTU's, why, it would command more of a price than a low BTU dust. So I would say from that standpoint, yes.

Q Isn't it also true, sir, that the cost of other sizes also is determined according to their BTU content?

A That is not the only factor, but you usually adjust a contract based on moisture and ash—on BTU content.

Q Is BTU more important for purposes of this adjustment that moisture and ash?

A Well, usually the moisture and the BTU are the primary ones you work with.

Q And the dust which is consumed at coal consuming facilities originates in coal mines, does it not?

A It originates in coal mines, yes.

Q And dust is shipped from the mine to the [377] consumer via barge and rail lines, is that correct?

A Are you talking about dust?

Q Yes.

A It is transported from the mine to the plant by rail cars or barges, you say?

Q It can be transported by both methods of transportation. Is that not correct?

A Yes.

[378] Q And coals of other sizes are shipped from the mine to the consumer via barge and rail lines, are they not?

A Yes.

Q And both dust and screenings are used for purposes of generating electricity by electric utilities, are they not?

A Yes.

Q Is it not also true that dust and screenings are consumed in the same boiler facilities?

A Yes.

Q Assuming that an electric utility has a pulverizer on its boiler, all of the coal which goes into that boiler after it is pulverized is in a dust state, is it not?

A Yes, sir.

Q So that if dust and other coal sizes are consumed in the same boiler facility and that boiler facility has a pulverizer, both the dust and the pulverized coal go into the unit in the same form, do they not?

A If the dust initially was at the same consistency as the dust that you bought, yes.

Q Isn't it true, Mr. Tomey, that most utilities [379] have pulverizers attached to their boilers?

A Pulverized fuel boilers do. Cyclone boilers do not.

Q Do Union Electric's boilers have pulverizers, its non-cyclone boilers? Let me rephrase that.

Do the Union Electric boilers which are not cyclone boilers have pulverizers on them?

A The ones using coal, yes.

Q Mr. Tomey, isn't it true that the price paid by Union Electric to individual suppliers varies according to the BTU content of the coal produced by each of those suppliers?

MR. KEMPF: I would like some clarification—I will object on the basis that Mr. Futterman should explain whether he is talking about delivered price, f.o.b. price, or what-have-you.

THE COURT: Rephrase your question.

BY MR. FUTTERMAN:

Q Isn't it true that the delivered price of coal on a BTU basis to any particular station may vary depending on which supplier has shipped that coal?

A The prices of coal to our various plants differ with suppliers, yes. They are not all the same, if I understand the question correctly.

[380] Q With a particular generating facility you would not pay the exact same price for every ton of coal you receive?

A That's correct.

Q And if we were to eliminate the transportation charge involved and just consider for the present purposes the f.o.b. mine price, the price of coal would vary from supplier to supplier, would it not?

A Oh, sure.

Q Mr. Tomey, the Meramec and Venice Plants have pulverizers, do they not?

A Yes, sir.

Q If you were not buying dust for the Meramec Plant, you would have to make up that difference for purposes of the coal needed to generate electricity, in other coal sizes, would you not?

A Other coal sizes?

Q Yes.

A Correct.

Q Mr. Tomey, I again hand you Government Exhibit 96, which you were discussing on your direct examination. Were you in charge of preparing the information which was furnished in that letter?

A Yes.

* * * *

[386] BY MR. FUTTERMAN:

Q Mr. Tomey, has Union Electric applied for any variances which may be provided in the St. Louis County air pollution ordinance?

A We have.

Q Have these been granted to you?

A They have not.

Q Is this a final decision?

A No, it's not a final decision.

Q Are you appealing that decision?

A Right now, as I get the picture, they're arguing amongst themselves who has the authority to grant variance. The counties say they do not have, and the state says they do not have, so now they are trying to get together, and how it will come out, it's supposed to be rendered within 30 days, to tell us what is the next step.

Q Are you seeking this variance because you cannot obtain coal, cannot economically obtain coal, which would meet the ordinance's requirements?

A We've been unable to obtain the coal.

Q You cannot obtain coal with the sulphur content of less than 2 percent?

A That's correct.

[387] THE COURT: So I have it clear, do you mean that the requirement of the ordinance is such that you cannot purchase coal on the market that will meet the requirement?

THE WITNESS: That's right, presently.

THE COURT: No low sulphur coal is available?

THE WITNESS: That's correct.

THE COURT: One other question: what percentage of low sulphur coal do you use in connection with your operation, do you know approximately?

THE WITNESS: Right now, about a sixth.

THE COURT: A sixth. In other words, then, five-sixth's is high sulphur coal?

THE WITNESS: That's correct.

THE COURT: All right.

* * * *

[393]

REDIRECT EXAMINATION

BY MR. KEMPF:

Q Mr. Tomey, during the course of Mr. Futterman's cross examination, when he discussed with you the pulverizers that you have at certain of your steam generating facilities which burn coal, does the fact that you have pulverizers at these facilities mean that your equipment can handle an unlimited amount of dust?

A Oh, no. That has no bearing on how much dust you can use, just from a matter of being able to utilize dust. About 50 percent is about all you can mix with the screenings and still do it successfully, because it really jams up the works. There are conveying belts and everything before you get to the pulverizer, a lot of transportation machinery to get the fuel to the pulverizer.

[394] Q Just for the benefit of the Court, what is the dust? What is the appearance of this substance? Let

us say I picked up a scoop of dust in my hand. What would be the result?

A It probably would run through your fingers. It would all go through a silk handkerchief.

Q I presume that is the reason why the conveying equipment would have difficulty with it?

A Well, of course the dust you buy is not that fine.

Q How fine is it?

A Well, there is a schedule on it, and I am not prepared at this time to give you what the consistency of the dust is. But it is considerably coarser than pulverized fuel that goes into your boilers for ignition or for burning.

Q During the course of your cross examination you also indicated that gas and oil were not, I believe Mr. Futterman's term was, price competitive with coal as a general proposition within your system. You also said that this was not the only factor that was considered. What are some of the other factors that are considered?

A Would you rephrase that question, please? I [395] don't believe I understand what you are asking.

Q During his cross examination, Mr. Futterman asked you whether or not as a general proposition for widespread use throughout your system gas was price competitive with coal and whether oil was price competitive with coal. I believe the record will reflect you indicated that under those circumstances they were not, but you indicated that apart from price there were other factors that had to be considered.

I am asking you now what some of those are.

A Of course one is air pollution. We are burning a substantial amount of gas this summer, during the summer season, on an air pollution suppression program at our Venice Plant.

Another one that Mr. Futterman brought out was the fact that when you have a coal mill out or want to overhaul a coal mill, you will buy gas so that you can overhaul your mill. The same could be true if your precipitators would happen to be out. You would overhaul your precipitators. The electrical system. You might use gas

or could use gas or oil to supplant coal as a fuel in your boiler so you can [396] do that work, rather than to discharge all the coal and fly ash into the atmosphere.

[397] Q Do you consider these other factors, such as air pollution, along with the price in deciding what particular fuel to use?

A You are more and more having to do that today. Air pollution is getting to be the overriding issue. The economics of the thing are getting less and less to be a factor.

Q You also referred to the subject of peaking during your cross examination by Mr. Futterman. I think he asked you some questions concerning the use of other fuels and the use of coal and how that relates to your peaking situation. I believe, and I don't mean to paraphrase the record, only to short-cut it, that you referred to the fact that you burn your most economical units initially and at the present time those are coal, and then as you increase your demand, you bring on your other stations.

My question during the course of your direct examination elicited the response which referred to the possibility of later in the decade possibly installing or at least giving consideration to the installation of a nuclear unit within the Union Electric system, and I ask would the same situation with regard to peaking exist should such a nuclear station come on line, and [398] what impact would that have on your coal burning?

A On a nuclear station, it is my understanding that those are base load stations. In other words, when those go into service, they have a generation continuously when you have the availability of the unit. That is in order that the economics will work out, because a fuel charge for nuclear units may be in the several millions of dollars for just a fuel charge. You work that continuously when you have the availability of the unit, and, of course, that would then supplant all the coal that normally would be burned under that situation.

* * * *

[400] BY MR. KEMPF:

Q Mr. Futterman discussed with you the experimental sulphur removal unit which Union Electric has been utilizing recently. When you came up to testify here at this proceeding, was that unit operational?

A It's shut down for more design repairs. It's strictly an experimental unit.

Q You indicated to Mr. Futterman that the Meramac and Venice stations in the St. Louis area presently do burn some high sulphur coal. Do you expect that to be true five years from now?

A Probably a shorter time than that, if we can find a source of low sulphur fuel, by either oil or coal. Because of the air pollution regulations, we are going to have to correct this situation.

Q Do you have any confidence at all that five years from now the Mound, Ashley, Venice and Cahokia plants will be burning any coal?

A Five years from now, I would say I would be mighty surprised that they would be burning coal unless there's a source of low sulphur coal available to us, [401] and then with that coal, there's considerable investment has to be made in precipitation equipment in order to utilize the lower sulphur fuel, lower sulphur coal, and it is possible, inasmuch as those are older plants, that we would just eliminate coal from those plants altogether.

Q Regarding the precipitator equipment to which you refer, are those low cost or high cost items?

A Precipitators?

Q Yes.

A They are extremely high cost, capital cost items.

Q You indicated that in the past you had purchased at least in one year a small amount of coal from the Little Dog Coal Company. Is that coal company in operation at the present time, do you know?

A They were having difficulty a few years back. We haven't bought any coal for a couple or three years from them, and I don't know whether they are or not. I don't think they are, but I don't know. They could well be.

Q You also mentioned that the reason you bought

coal from them was because they were located, I think you said, on the Illinois Terminal Railroad—

A That's correct.

* * * *

[403] Q How many of your plants are on the Illinois Terminal Railroad?

A Well, only the Venice Plant.

Q Mr. Futterman also asked you some percentages in terms of the fuels that in the final analysis you are presently actually using at your generating station.

My question is, regardless of what fuel you eventually end up using at a station, do you consider all fuels when you make the decision as to what to buy in the final analysis?

A Well, yes. That is part of the analysis of what type of plant to build and where you build it, is fuel consideration, because that is one of the largest costs a utility has to face is fuel, electric utility.

MR. KEMPF: I have no further questions, your Honor.

THE COURT: All right.

MR. FUTTERMAN: I have a few questions, your Honor.

THE COURT: All right. Proceed as rapidly as possible, Mr. Futterman.

MR. FUTTERMAN: Yes, sir.

* * * *

[407] RECROSS EXAMINATION

* * * *

MR. FUTTERMAN: Your Honor, Mr. Kempf is trying to bring out the fact that Union Electric will be eliminating its coal consumption at the four plants mentioned in the next five years, and I believe he is trying to show that Union Electric was, I believe, decreasing its coal consumption, and I would like the witness to explain to the Court the true facts in regard to whether or not the total coal burned by Union Electric will be increasing when the new units come on line.

THE COURT: I think both of you have the wrong premise in this. You have to consider the pollution ordi-

nance requirements and all the rest of it, which, to me, is the vital element that is trying to be glossed over here. I'm interested in considering low sulphur and high sulphur, and that to me is the breakdown that we have here, and that applies to these new plants.

BY MR. FUTTERMAN:

Q If I may ask, Mr. Tomey, will the Labadie No. 4 Unit be burning high sulphur coal?

A It will be burning high sulphur coal, correct.

Q Regarding the new units to come on line in 1975 and 1976, do you have any idea whether the coal [408] will be high sulphur or low sulphur at this time?

A We had hoped that there would be a sulphur removal system commercially available to us by the 1975-76 generation, but it appears that that's not going to be available so therefore we will have to find a low sulphur fuel, either oil or coal, to burn, to fuel the 1975 and '76 generation with.

Q If you determined to use low sulphur oil, will that not have to be imported from abroad?

A It's my understanding that there is not a sufficient low sulphur oil domestically. It will have to be imported.

Q When you import low sulphur oil from abroad, do you not have to work through the State Department?

A You have to get an import quota in the Middle West.

Q Are your base load plants at the present time coal burning?

A Oh, yes.

Q Mr. Tomey, is it not a fact that one of the main reasons for delay of nuclear plants are the problems involved in the construction of these plants?

A Well, that could be one factor, but it would be only one factor.

* * * *

[412] THE COURT: I make this suggestion: when you go through the transcript, so that there will be no question later on, make those changes.

MR. KEMPF: Fine, your Honor. I do not think it is a substantive point. Thank you.

* * * *

[413]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; AND FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,
Thursday, April 2, 1970,
10:15 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM

[414] THE CLERK: Case on trial.
THE COURT: Are you ready to proceed?
MR. EISEN: Yes, your Honor.
THE COURT: Will the witness take the stand, please.

JOHN M. MORRIS,

called as a witness by the defendants, having been previously duly sworn, was examined and testified as follows:

CROSS EXAMINATION

(resumed)

BY MR. EISEN:

Q Mr. Morris, you testified on direct examination that United Electric owned a substantial amount of underground coal in Colorado, is that correct?

A We have some leases out there with the Federal Government on both strip and underground.

Q About how many tons of underground coal does UEC own in Colorado?

A We have never been able to determine that, because we have not done any drilling on the underground. We can only guess at it from the Colorado Bureau of Mines estimates, which we certainly would want to check carefully. It has been estimated roughly at 60 to 70 million tons.

Q But there is a certain amount of that coal, [415] is there not, that you own, that UEC actually owns?

A It is all under lease. Wait a minute. There is a small amount we acquired from some property owners, private property owners, and I can't remember whether we bought the coal outright or whether we leased it from them.

Q Was that leased coal which you are referring to include coal which is controlled by location?

[416] MR. HEDLUND: Your Honor, I am going to object at this point, that is, to further questions in this direction and on this line, for the following reason:

It has been agreed among the parties to this lawsuit that the extent of the reserves of United Electric outside of the Midwest is not in issue. While I concede that, I believe, under direct examination I referred with Mr. Morris to some of these properties, it only was for the purpose of showing the results of the affiliation of these two companies

If Mr. Eisen wants to confine his cross examination to that aspect of Western reserves, I have no objection; but the quantity and quality of the reserves of United in the West are not at issue in this lawsuit.

THE COURT: Do you desire to comment?

MR. EISEN: I would take issue with the last statement counsel has made. I think we will concede that it is not in issue insofar as the determination of the effect of the merger on the relevant market area. However, the amount and quality of reserves in Colorado may come into importance in the question of relief and the question of the viability of any company which might be divested in this case in the [417] event that UEC is divested.

My examination in this regard is very brief, and I did not intend really to get into it as much as counsel did on direct examination.

* * * *

[430] BY THE WITNESS:

A So far as our company was concerned, and other strip mine companies, I do not agree with him.

Now, he may have been referring to underground coal, but even at that time that you mention, strip companies were still actively engaged in looking for strip reserves. I don't know what was going on in the underground business.

BY MR. EISEN:

Q They were actively engaged, is it your testimony, despite the fact that they had lost the transportation market and the home heating market?

A They were.

Q Don't you think that the absence of the demand or the relative absence of the demand for coal at that time, due to these changes might have affected Mr. Kolbe's thinking?

MR. HEDLUND: I object to that on the basis that I do not believe that there has been a foundation laid for asking Mr. Morris—

THE COURT: Let him answer so that we can proceed. He may answer, subject to the objection.

BY THE WITNESS:

A I don't know how Mr. Kolbe felt about it, but [431] we were continuing our efforts on strip coal, and Mr. Latimer thought that we were not doing enough, and that is why he wrote that memorandum, and that other companies were getting in ahead of us.

What Mr. Kolbe's feeling was about it at that time, I can't read his mind, or I couldn't read his mind.

BY MR. EISEN:

Q Are there any minable coal reserves available—I mean, are minable coal reserves in great demand today in the Eastern Interior Coal Province?

A When you refer to the Eastern Interior Coal Province, if I may, all I know is the Midwest, Indiana, Illinois and West Kentucky. Is that what you mean?

Q I will accept that as part of my question.

A I refer to that as the Midwest. I never heard of the Eastern Interior Coal Province. Your question was, is there active—

Q I said, is there a great demand for coal reserves in that area today?

A Yes, there is.

Q Are there any available for purchase, that you know of?

[432] A You mean, strip coal?

Q Either one.

A I don't know of any—or I didn't know of any at the time I retired.

[433] Q Have air pollution control regulations caused any reserves to be available on the market, that you know of?

A Air pollution has developed strongly in the last four years. It was just beginning when I left, and I have no knowledge of what has transpired since I left the company.

I do know from hearsay, reading the newspapers, that air pollution is definitely going to change the entire picture of coal mining and coal marketing, and what it has done to the reserves, I can't tell you.

Q Have you heard of any reserves being available by reason of the fact that nuclear generating facilities are being planned?

A Again, my answer is the same. I have been away from it four years.

Nuclear was beginning to be a serious threat, competitively, when I left. What has transpired since, I don't know.

Q But you have not heard of an reserves becoming available as a result?

A I would not have any way of knowing.

Q Do you think that the demand for coal will increase, Mr. Morris?

[434] A Again I must plead lack of up-to-date knowledge of the competitive factors. Air pollution is going to control that to a large extent, I think.

Q When do you date your lack of knowledge with regard to competitive factors in the market?

A November, 1966.

Q As of November, 1966, Mr. Morris, were you of the view that the coal industry would remain a vital force in the future of our country and its economy?

MR. HEDLUND: Your Honor, I don't really object to this, because Mr. Morris, up until at least that point, was well qualified, in my judgment, to speak with respect to every aspect of the coal industry, but I do believe this is beyond the scope of my direct examination.

THE COURT: Do you have any comment, Mr. Eisen?

MR. EISEN: I think this is a very important question, your Honor, and—

THE COURT: The point is whether it is beyond the scope of the direct examination. That is the point raised by Mr. Hedlund.

MR. EISEN: I may concede that it is beyond the scope of the direct examination, your Honor—

THE COURT: All right.

• • • •

[436] BY MR. EISEN:

Q Coal is our principal resource for energy, is it not, Mr. Morris?

A Yes; I would say so.

Q Did you see in the paper yesterday where it was reported that the president of Peoples Gas says that he can't sell gas to the utilities because there are only 15 years of gas reserves available?

A I did not see it.

MR. HEDLUND: I object to that as beyond the scope of the direct examination.

THE COURT: He has answered the question. Proceed.

BY MR. EISEN:

Q When was it, Mr. Morris, that you referred the Vogue property and the Pond River Field, I believe you called it, to Mr. Kolbe?

A Well, it is so far back that it is pretty hard for me to remember exactly. I would say it was back in the 1940's some time.

Q You referred on direct examination to a conversation with Mr. Wellington of the Central Illinois Light Company with regard to whether or not UEC would have sufficient reserves to bid on a contract with Central Illinois, did you not?

[437] A I did.

Q When was this conversation, Mr. Morris?

A Well, I stated it in my deposition. It was during the period starting about 1958, I think, or 1959, and continuing on up to the time that I retired.

Q This conversation?

A Many conversations.

Q Did you ever offer to supply him with Freeman back-up reserves?

A I told him that our relationship with Freeman was such that even though our reserves were not adequate, from his thinking, we could and would use Freeman as a back-up for the contract beyond the time we could supply the coal ourselves.

[438] Q What did he say?

A At the time I left, he had been unwilling to definitely give me an answer on that. In fact, the last year I was there, there was a letter written to me on that subject, which you have a copy of.

Q That was DX-26, to which counsel referred in his examination?

A You have the letter there. You know what it is.

Q No. Is that the same letter you are referring to?

A The same letter; the same letter, yes.

Q Did you then have in mind, in your discussions with him, the North Canton Field?

A No, I had in mind the Crown mine.

Q Has UEC continued to supply Central Illinois?

A They have.

Q From what reserves?

A From the reserves of their Cuba mine, and when those run out in another year or two, from the Buckheart mine.

Q Do you think that the reserves at the North Canton Field will be utilized?

A They will be utilized to the extent that we [439] can mine up there, and are listed as a part of the reserves available to the Buckheart plant.

That forms the life of the Buckheart mine, the North Canton reserves. We think we can mine a lot of it up there that we may have trouble with, that we may find ourselves in trouble on, but we have taken the position that that coal will move through the Buckheart plant.

Q You do not recall mentioning the North Canton Field to Mr. Wellington?

A He knew about the North Canton Field. I gave him a complete list of all our reserves and he knew all about what we had.

In fact, he sent his own people out around through Fulton County to investigate the reserves of all companies. He knew as much about the reserves in Fulton County as anybody in the coal mining business.

[440] Q Would you make a general statement about the utility people in that regard, that they know about as much about coal reserves being available as the coal mining people themselves?

A I would not, because I don't know. But I did know of the activity of the Central Illinois Light people, who were only about 15 or 20 miles away, and they had a lot of opportunities to go out through the fields, talk to the people, and they kept themselves familiar with the area.

Q How many tons would you estimate are available in the North Canton Field?

A Well, our figures are a better answer to that than I am. I would rather refer to the documents you have that we have submitted to answer that question.

Q I will withdraw the question for now.

THE COURT: All right.

BY MR. EISEN:

Q You testified on direct that Mr. Kolbe made no objection at the board of directors meeting when it was proposed that additions to the Industry Field be made at farmland prices, isn't that correct?

A I don't recall that he made any objection, no.

* * * *

[445] Q Incidentally, the Industry reserves are carried on the reserve books of The United Electric Coal Companies at about 12 million tons, are they not?

A Whatever the record shows there. That is my recollection.

MR. EISEN: Will counsel stipulate that is approximately correct?

MR. HEDLUND: Will you give me an opportunity to look and find out?

THE COURT: Is it a matter of record?

MR. HEDLUND: It is a matter of record, your Honor.

MR. EISEN: It is a matter of record, your Honor, but I have to ask the question so as to put my next question to the witness.

THE COURT: I will take your word if it is a matter of record.

BY MR. EISEN:

Q Assuming that it is 12 million tons—

A I will take it if it is a matter of record.

Q Actually, there are many times more, maybe even ten times more, coal in the area than that 12 million tons, are there not?

A I have no knowledge of that. That would require, again, drilling, exploration, and a [446] tremendous amount of work to find out. It is purely a guess based on

what geological survey reports show, which we could not take for the purpose of acquiring reserves. We would want to know more about it. Our engineering people have said there is some other coal, some more coal, available down there. How much I don't know.

Q What figures did you use when you were discussing the possibility of developing that with these Iowa utilities?

A We told them about the surrounding area, what we might be able to acquire, that we would have to drill it, that we thought there was so much there—I don't remember what the figure was, but I don't think it was anything like what you said, that ten times, which would be 120 million tons.

Q How about eight times?

A Oh. I would say more nearly 25 or 30 million tons would be as much as I would estimate, based on my recollection. That is mineable coal, coal we thought might be mineable coal.

* * * *

[450] Q He came on the same time as the other gentlemen you have just named?

A He came on the same time as the other gentlemen, but to represent these other stockholders.

Q And Mr. Nugent was chairman of the Executive Committee at that time, was he?

A He was, yes.

Q You testified on direct, Mr. Morris, that you informed major customers of the advantages of being combined with Freeman, do you recall?

A I did.

Q Did you tell them that the combined companies would be able to satisfy their needs better than your smaller competitors?

A Yes, I did.

Q Did you tell them that now they could do business not only with one of the top strip mining companies, but also with an underground operator with considerable underground reserves?

A I told them that the relationship of our two companies and the reserves of Freeman and their knowledge of underground mining made a combination which I

thought was very valuable to them as large coal [451] users and gave them a security beyond which our particular company could provide.

[452] Q You told them, did you not, that they had a much stronger company to depend on?

A That is correct.

Q And you were much stronger, combined with Freeman, then you were separated, were you not?

A That is right.

Q You had a lot more market power.

A Well, my sole thinking was, at that time competition being as severe as it was, and with the attitude of these buyers, we needed the help of Freeman to support our position in the market.

It did not occur to me or appear to me that we could exert any stronger pressure on the market except with the people we were doing business with, because we could at least supply their demands, but we had plenty of competition, and that was the reason I was going around telling that story.

Q Mr. Morris, you testified on direct examination that there were production problems at Fulton County in 1946, and you attributed such problems to the breakdown of the Kolbe wheel excavator at that time.

A Yes.

Q Do you recall that?

A Yes.

* * * *

[480] BY MR. EISEN:

Q Isn't it a fact that the screenings produced at the Banner mine have a higher BTU content than those produced at the Crown mine?

A Yes, that is true.

Q And isn't it a fact that to the extent a utility is consuming dust, it is unable to consume screenings?

A I don't understand that question.

Q If it is using dust in the boiler, at that time it is not using screenings, isn't that a fact?

A Usually they mix it, as far as I know. In fact, most of those plants have to mix dust with screenings to some extent.

Q Does United Electric produce any dust?

A No.

Q You have never sold any dust from the Fidelity mine?

A Never sold any dust, no.

Q Does a ton of dust at the steam plant replace a ton of coal at the steam plant?

A It would depend on the BTU of the coal it was replacing in relation to the BTU of the dust. If they were both the same BTU, a ton of dust and a ton of [481] coal would accomplish the same purpose.

Q And the price of the dust is determined, is it not, on the basis of its BTU content?

A That plus the fact that it is a byproduct, and it is not too easily disposed of because of its physical characteristics and the difficulty in handling it.

Q Isn't it a fact that the cost of other sizes also is based on their BTU content?

A That is correct.

Q The dust which is consumed at consuming facilities originates in coal mines, does it not?

A Yes.

[482] Q Coals of other sizes consumed at consuming facilities also originate at coal mines?

A Yes.

Q Dust is shipped from the mine to the consumer via barge and rail lines, is that correct?

A That's correct.

Q Coals of other sizes are shipped from the mines to the consumer via barge and rail lines, are they not?

A That is correct.

Q What is the coal used for?

A Making steam for electricity.

Q And that is true of dust as well as screenings, is that correct?

A That is true.

Q Isn't it also a fact that dust and other coal sizes are consumed in the same generating units?

A That is correct.

Q You know, do you not, that a pulverizer makes coal into a dust size?

A Below the size of what is shipped from the mine. Makes it even finer.

Q Assuming that an electric utility has a pulverizer on its boiler, all coal sizes it consumes [483] will be crushed to a dust size or smaller prior to the consumption, is that correct?

A That's correct.

Q Isn't it true that most utilities do have pulverizers attached to their boilers?

A Most of them do, they also have other types of burning equipment in a good many instances, too.

Q Isn't it true that all coal sizes consumed in a pulverizer boiler will be crushed to a dust prior to consumption?

A That is correct.

Q Referring to the contracts about which you testified on direct examination, listed on Government Exhibits 88 and 89, being for the years 1965 and 1966, did you discuss any of these contracts with anyone from Freeman?

A You mean our own contracts or theirs, or what?

Q Do you recall that these exhibits show shipments by both companies, Freeman and United Electric, to facilities of the same companies? Do you recall that?

A Yes, I recall that statement.

[484] Q Did you discuss, taking the first entry, Caterpillar Tractor Company, Peoria, Illinois—did you discuss with anyone from Freeman your sales of shipments to Caterpillar?

A Not for Caterpillar. That wasn't a large enough contract to bring to the attention of Mr. Nugent or anybody over there.

Q When did the Caterpillar contract first go into effect?

A That was usually an annual contract, and we have shipped them coal for many, many years. I don't know how long. Many years. But it was renewed annually, or negotiated annually.

Q Which one of these accounts do you recall you discussed with Freeman?

MR. HEDLUND: I would like to ask if perhaps it

wouldn't facilitate things if you gave the witness a copy of the exhibit.

THE COURT: Is there any objection to doing that?

MR. EISEN: No objection.

BY MR. EISEN:

Q Referring to the left-hand column—

MR. HEDLUND: I am unclear of the question.

THE COURT: Read the question.

(Question read by the reporter.)

[485] BY THE WITNESS:

A Central Illinois Light Company; Commonwealth Edison Company; Illinois Power Company; Union Electric Company. Those were major contracts, and naturally we discussed them with our people on the Board and also Mr. Nugent.

BY MR. EISEN:

Q Referring to the Central Illinois Light Company, did you discuss with anyone from Freeman as to what prices you would submit on those contracts?

A Yes, I did.

Q With whom did you discuss that?

A I discussed it with Mr. Nugent.

Q Was that in your office or his office?

A I don't remember which.

Q In relation to the date carried on the exhibit, 1965, approximately when was his conversation, as nearly as you can recall?

A Oh, early in 1965, I would guess.

Q What was the conversation that you recall?

A We had a contract with Central Illinois Light at that time that had some time to run. I forget how long. There was an understanding that we would renew it or that we would extend it if they asked for it. [486] I merely told Mr. Nugent about it and what the price was, and the other terms of the contract. Also I remember at that time I told him we were going to have to consider what to do with Central Illinois Light beyond the time of our reserve playing out.

Q Did he tell you at what prices Freeman was selling Illinois Light?

A He did not.

Q Did you ask him?

A I wouldn't ask him. I couldn't reach the plant he was serving, and he couldn't reach the plant we were serving. There was no point in asking.

[487] BY MR. EISEN:

Q You say you discussed also with someone from Freeman the Commonwealth Edison contract?

A Yes, with Mr. Nugent.

Q And was that—where did that conversation take place?

A Oh, frequently we discussed Commonwealth Edison, and that, again, when he came on the Board, starting in about there, 1959.

Q Did you on those occasions discuss the price that you should bid?

A We did, yes.

Q Referring back to the Central Illinois Public Service Company, is that one of the contracts that you said you discussed?

A No, I did not discuss that.

Q Oh, I am sorry. Excuse me. I withdraw that. Illinois Power Company, I believe was one that you listed?

A That was a significant account, we discussed it, yes.

Q And did you discuss the price that you were to bid on that one, did you say?

A That's correct.

Q And I believe the last one you mentioned was [488] the Union Electric Company contract; is that correct?

A That's correct.

Q And did you discuss the price at which you were selling to Union Electric?

A That contract had been made prior to the time Mr. Nugent came on the Board.

Q Excuse me, sir, I think we should specify there are two contracts, one is for the Meramec plant and one is for the Venice plant. Did you discuss both of those contracts with him?

A We didn't ship to Venice, we only shipped to Meramec. We may have shipped a small tonnage to Venice, but very little, most of ours was Meramec, and we already had the contract when Mr. Nugent came on the Board, and I began my discussions with him, and I did discuss the Meramec contract with him, yes.

Q And these contracts come up from time to time for discussions with regard—with the customer—with regard to changes in price due to rate increases and things of that sort?

A They do, yes.

[489] Q So did you have occasion to discuss the price that you would ask of Union Electric with Mr. Freeman on those occasions?

A You mean—

Q With Mr. Nugent, I am sorry.

A You mean when we had to renegotiate the price because of a labor and wage increase?

Q Yes, sir.

A It was not necessary to discuss it with him because Union Electric and these utilities had a formula in their contract that was very precise and when you had a wage increase or anything of that nature, the contract itself spelled out just what figure you could use in establishing the price, so it was automatic.

Q Was that true of the Union Electric contract?

A That was true of the Union Electric contract.

Q These contracts are not uniform in every way in that respect, are they?

A No, they are not in every detail, no.

Q Even insofar as these escalation clauses, they are not uniform?

A They are not uniform, no.

Q Did Mr. Nugent discuss with you his contract—that is, the Freeman contract?

[490] MR. HEDLUND: I want to clear up what contract you are referring to Mr. Eisen.

MR. EISEN: I am referring to the Freeman contract to ship Orient No. 3 coal to the Meramec plant at Hillcrest, Missouri.

MR. HEDLUND: This is in 1965?

MR. EISEN: 1966, I am sorry.
THE COURT: Is there a question pending?
MR. EISEN: I believe so.

BY THE WITNESS:

A You asked me if I discussed Freeman's contract with the Meramec plant of Union Electric, I didn't particularly discuss it with them. I knew he had one and I knew the price was substantially under ours. I didn't have to discuss it with him because it was not competitive with me.

BY MR. EISEN:

Q What was his price, do you recall?
A Considerably under ours. I don't remember. I think it was, oh, at least 25 or 30 cents a ton, maybe more.
[491] Q How did you know that?
A I asked him.
Q So at least you discussed it to that extent?
A I did to that extent.
Q During part of the time that you were vice president in charge of sales or the sales manager of United Electric, you called on all of these companies listed on GX-89 and 88, did you not, as well as many others?
A Yes, I did.
Q And during some of that time—during some of the time when you were vice president in charge of sales, Frank Nugent was vice president in charge of sales for Freeman, was he not?
A Yes.
Q Did you in that period discuss coal prices with Mr. Nugent?
A Prior to the time they became financially interested in our company to a substantial extent, I did not. I can't give you the exact date of that but I think prior to 1955 I did not.
Q And why not?
A Well, I had no reason to, no occasion to. Why should I?
[492] Q Well, why did you have an occasion to afterwards?

A Because he had a substantial interest in our company and was wanting to know what was going on over there.

Q What is The Rail To Water Transfer Company?

A That is a dock located on the South Side of Chicago for the purpose of transferring coal from rail cars into lake vessels.

MR. HEDLUND: Your Honor, if for nothing else and it's near the adjournment hour, I am going to object again. This is outside of the scope of direct.

THE COURT: Do you have any comment?

MR. EISEN: Your Honor, I think that this goes to the question of whether they were competitors or not, and counsel, though he didn't ask about the Rail To Water Company, it's right in line with his examination with regard to whether they competed with each other or didn't compete with each other for the business of these utilities that he went into rather thoroughly, I thought, in his direct examination.

THE COURT: All right. He may answer.

Is this starting with a new line or will it be extensive?

[493] MR. EISEN: This part about the Rail To Water Company is short. We can finish that.

THE COURT: All right, then let's finish that.

MR. EISEN: Do you have the question, Mr. Morris?

THE WITNESS: I don't believe I have it in my mind.

THE COURT: Read the question.

(Record read.)

THE COURT: There is no question.

THE WITNESS: No question.

MR. EISEN: I am sorry.

BY MR. EISEN:

Q Isn't it a fact that both United Electric and Freeman were stockholders on the Rail To Water Company?

A That is correct?

Q And is it a fact also that Tom Tarzy when vice

president in charge of sales for United Electric was a director of the Rail To Water Company?

A That is correct.

Q And during the same time wasn't Barton Gebhart of United—of Freeman, I'm sorry—a director of Rail To Water?

A I believe he was.

[494] Q Between 1955 and 1960, how many occasions—on how many occasions did you discuss price with Mr. Nugent with respect to utility contracts?

A Every time we had a reason for changing in any way any of our major contracts. I can't tell you how often that was.

Q You testified on direct examination that United Electric and Freeman were "associated" in the late 1950's and early '60's, is that correct?

A That's correct.

Q Isn't it a fact that as of July 31, 1960, General Dynamics disclaimed that its 37 percent interest in United Electric constituted control of UEC?

A They may have, I don't know.

Q I would like to show you a document which I will ask the reporter to mark GX-108 for identification.

(The said document was thereupon marked as GX-108 for identification.)

MR. HEDLUND: Does the Government have an extra copy of that for defense counsel?

MR. CUSACK: Yes.

• • • •

[506] AFTERNOON SESSION

2:15 P.M.

• • • •

Q Mr. Morris, you stated that—on direct examination—that UEC's Cuba Buckheart coal was not competitive with Freeman's Crown coal to the Caterpillar Tractor Company facilities listed on GX-88 and 89, did you not?

A I said we could not ship to Decatur, Illinois where Crown coal went on a competitive basis, and they could not ship to the two plants where our Cuba Buckheart was going. That's what I said.

Q Incidentally, you are not contending, are you, that one coal is preferred over the other because of the burning characteristics?

A Not in that instance, no.

Q Mr. Morris, I suggest to you that except for the Wisconsin Public Service Company there are no other consumers on GX-88 and 89 that prefer Freeman coal over UEC coal or vice versa because of burning characteristics?

A Yes, there are some.

Q Would you take exception to that suggestion?

A Yes, I would. Do you want me to name them?

Q Yes, sir.

MR. HEDLUND: Wouldn't it be easier, Mr. Eisen, and only fair if you would give the witness the [507] exhibit to which you are referring? I don't believe, your Honor, we are in a memory training session. Your Honor, I think it's only fair that he have the document in front of him.

THE COURT: I explained that before, whatever documents are available, unless there is some reason and you may state that now, Mr. Eisen, rather than having the witness try to guess, to let him have the benefit of the documents.

MR. HEDLUND: Thank you.

BY MR. EISEN:

Q Could you tell us, Mr. Morris, which if any of the companies on GX-88 and 89 could not use either the coal of UEC or Freeman because of burning characteristics?

A Inland Steel Company couldn't use our coal for metallurgical purposes. They could use our coal for steam.

Marquette Cement Manufacturing Company could not use our coal at Milwaukee or Cape Girardeau, and I don't know about their Des Moines plant. The burning characteristics were such that I was told they would have to have high grade coal at those plants.

Now let me look through this some more, [508] if you will.

Q Surely.

A Now, you are only talking about burning characteristics at this time, is that correct?

[509] Q Yes, sir.

A Wisconsin Public Service Company has already been referred to. Is that correct?

Q Yes, sir.

A I think that would be all that is on this list.

Q You might as well keep that list in front of you, Mr. Morris. I will ask you a few more questions about it.

Do you know the freight rate from the Crown mine to Caterpillar's Decatur plant?

A I can't tell you exactly. The Springfield mine of Crown, the Crown mine at Springfield had a favorable freight rate in there. We didn't have one that would allow us to ship in there.

Q And you did not know the precise cost of Freeman's freight rate of shipment to that vicinity?

A We knew it, because it was published in the regular railroad tariffs. Certainly we knew it.

Q Just sitting there now and testifying—I believe you testified the reason why you couldn't ship it in there was because of the freight rate, is that correct?

A That is correct.

[510] Q But you don't know what Freeman's delivery cost was in there now? You can't tell us, can you?

A I didn't know their price f.o.b mine, but I did know the freight rate compared to our own, and looking at the two, it is perfectly obvious we didn't have any chance in there.

Q The fact that it was more advantageous for them to ship in there did not necessarily mean that you could not have shipped in there at a profit, did it?

A If we wanted to take a sacrifice on our price, below what we were selling coal at to our regular customers, where we could meet their favorable freight rate, we could have moved on in there, but not at any kind of price that we would be willing to take.

[511] Q Because the demand for your coal elsewhere afforded you a greater profit than had you shipped in to Carterpillar at Decatur?

A That is correct.

Q When was the last time you reviewed the freight rates from Cuba or Buckheart to Decatur, Illinois?

A 1965, 1966.

Q Sometimes those freight rates can be negotiated, can't they?

A On volume tonnage, yes, and minimum trainload shipments. Decatur didn't use enough coal to justify that sort of arrangement with the railroads. It takes a million tons a year or thereabouts to negotiate that kind of freight rate break.

Q But, Cuba-Buckheart and Crown are both close enough to Decatur, Illinois, are they not, so that a variation in either cost of production or cost of freight could make or could change the circumstances from what they were at the time you are referring to that you are testifying about?

A At the time when I last had anything to do with it, the price we would have to make at Decatur to put any coal in there was too low for us.

[512] Q Mr. Morris, you stated that Freeman sold dust below its cost or below cost from its Orient Mine to the Grand Tower Plant of Central Illinois Public Service Company, is that true?

A I think that is true, yes.

Q What were the costs of producing this dust at Freeman Orient Mine?

A I don't know about Freeman's cost. I only know what Mr. Nugent told me about the price of dust and what our customers told me about the price of dust, and I could see from the price that it must be below cost of production.

[513] Q Below cost of production as compared to cost of production of screenings?

A You have to put it all into one package. One piece of coal would cost just as much as another to produce. When you prepare through a washing and cleaning plant, you have to average the price that is going to return you an average realization sufficient to make a profit.

Metallurgical coal sold at a high price. Dust sold below cost. The two together were very satisfactory.

Q So that when you were using the term "below cost," you were using it only in the sense that it was not below the cost of mining the dust.

A Dust was a part of the product that came up from the mine. It cost just as much to produce dust as it did anything else.

Q And you are saying that according to Mr. Nugent, they lost money every ton of dust that they sold into the Central Illinois Public Service Company?

A Yes, sir. That's right.

Q In other words, Freeman was losing money on approximately 102,803 tons shipped to the Grand Tower plant?

[514] A That is correct.

Q You stated that Freeman was shipping this by-product dust to the Meredosia plant of the Central Illinois Public Service Company, which plant UEC was also shipping.

This amounted to approximately 82,000 tons in 1965.

I suppose that that dust in this instance was also sold below cost.

A That came from the Crown mine, and I am sure it was below cost, although I didn't know the price of it.

Q And you are sure how, sir?

A Because that is the only way they could have put it in there against Cuba-Buckheart for the kind of transportation cost we had versus theirs.

[515] Q You stated that UEC did not have any high quality coal with which to compete with the metallurgical grade coal and therefore did not produce or sell the by-product dust, is that correct?

A That is correct, plus the fact that our plants were not designed to make it.

Q But that the Freeman Crown Mine did sell dust?

A They did for a period of time.

Q Is it not a fact, Mr. Morris, that UEC's Banner and Cuba Mines produce a higher quality coal than the Freeman Crown Mine?

A Banner does. Cuba washed coal versus Crown

washed would be about the same. If Cuba washed versus Crown raw, the washed Cuba would be better, yes.

Q Did you testify that the washed coal of each would make the Cuba coal superior in quality to the Crown coal?

A I said they would be about the same in my estimate.

Q You stated that UEC coal from its Fidelity Plant to TVA was sold under contract below cost, is that right?

A That is correct.

[516] Q This amounted to approximately 250,000 tons of coal each year, did it not?

A In what years? Do you have it there? These two years 1965 and 1966?

[517] Q Yes, sir.

A Yes, sir, that is correct.

Q Fidelity Mine was able to remain a profitable mine despite the fact that it sold approximately half a million tons of coal at a loss to TVA in those two years?

A Only our reports will so indicate.

Q What were your costs at Fidelity, the cost of production per ton?

A I would rather look at our reports to give you that. I can't do it from memory, four years ago.

Q But you are going on memory that those shipments were made below cost?

A I am.

Q What was the realization per ton under Freeman's contract with TVA?

A On United Electric's coal?

Q No, Freeman's coal.

A I don't know.

Q Do you know whether its sales were below cost to TVA?

A I don't know. I can only assume they were not, or he wouldn't have made the contract.

Q Mr. Morris, you stated that Freeman's coal [518] shipments to Union Electric's Venice plant, representing approximately 128,800 tons of coal in 1965, was again this byproduct, dust, right?

A Yes, from my best knowledge and recollection I'm sure it was.

Q I take it that this shipment was also sold below cost?

A I would say so, yes.

Q You stated that Freeman's coal shipments to Union Electric's Meramec plant amounting to 172,000 tons in 1965 would also be dust byproduct, did you not?

A I did.

Q Again, is it your contention that this dust was sold below cost by Freeman?

A I think it was, yes.

Q You stated that the Alma and Stoneman plants of the Dairyland Power located on the Mississippi River was the best market for the Belleville district mines, including Fidelity? Do you recall that?

A That is correct.

Q What did you mean by best markets?

A Well, all of the plants on the Upper Mississippi River, starting at Minneapolis on the north down to and through Dubuque, Iowa, constituted our normal markets and our best markets for Fidelity coal. That is because of the transportation.

[519] Q So that the companies located in the Belleville Freight Rate District can make the greatest profit on shipments to the Stoneman and Alma Stations, is that your testimony?

A They could make better profits there than trying to go into an area where they didn't have a transportation advantage, yes.

Q Is it your testimony that other coal companies which cannot enjoy as great a profit from sales to the Alma and Stoneman Plants of Dairyland Power as the Belleville mines are not in competition for the fuel requirements of those plants?

A Only those that are willing to take a substantially lower price for their product, and we never found them to be serious competition in those plants, no.

Q But if that kind of a situation arises where you find that you have competitors who for reasons best known to them, as far as their own financial arrange-

ments are concerned, are able to overcome a disadvantage in the freight rate, you couldn't assume they are operating at a loss thereby, could you?

A Not unless I knew their prices and knew [520] something about their cost of production.

Q You stated that Freeman was shipping dust to the Alma and Stoneman Stations, is that correct?

A Yes, sir.

Q GX-88 shows that in 1965 Freeman shipped almost 56,000 tons of coal to the Alma Station. Is it your belief, again, that this dust was shipped below cost by Freeman?

A I believe it was.

Q You stated that UEC and Freeman did not compete for the business of the Foote Minerals operation in Keokuk, Iowa, is that right?

A That was under the same circumstances as these other plants that you have brought to my attention.

We shipped screenings from our Cuba and Buckheart Mines on a favorable freight rate because we were not—not from Buckheart—on Cuba because it was on the TP&W Railroad with a direct rather short haul to Keokuk.

Freeman put dust into that plant via the river and for that reason I didn't consider them competitive.

Q UEC was shipping coal by rail and Freeman was shipping dust by barge, isn't that right?

A That's correct.

[521] Q Now, the document shows that Freeman shipped approximately 73,000 tons to Keokuk.

MR. HEDLUND: Correction, Mr. Eisen. On my copy it shows 25,000 tons, if I have got the same year. Are you talking of 1965?

MR. EISEN: I will check mine. I was reading from my notes, counsel, not from the document itself.

I stand corrected—I see, 73,000 tons.

MR. HEDLUND: Your Honor, may I compare as to what we are looking at?

THE COURT: You certainly may.

MR. EISEN: I was looking at the wrong column here.

THE COURT: All right.

BY MR. EISEN:

Q 25,589 tons.
A That is what I see here.
Q Would it be your testimony that they were selling then at a loss?
A It would.
Q And your testimony would be the same for 1966?
A It would.
Q As to the 31,000 tons they were shipping in of dust?
[522] A It would.
Q You stated that UEC could not compete with Freeman for the Wood River station of the Illinois Power Company because Freeman was shipping dust to that station, is that correct?
A That's correct.
Q You stated that Belleville coal did go into the station on a unitized train rate set up by the GM&O Railroad, but that UEC wasn't on the railroad and couldn't participate in that movement, is that correct?
A At the time I left, we—or before I left, we attempted to interest Illinois Power in our Fidelity coal. We tried to get a rate from the Illinois Central on which we were located or the Missouri Pacific, that would permit us to go in there and we couldn't do it, so my testimony is as it was before.
Now, what's happened since then, I don't know.
Q You hadn't heard that UEC was able to ship into there in 1967?
A I had not heard that.
Q So would you know whether or not UEC and Freeman compete for the requirements of the Wood River facility?
MR. HEDLUND: Are you asking—excuse me, I will [523] object unless you specify the time.
THE COURT: Set the date.

BY MR. EISEN:

Q 1967.
A I do not know anything about 1967.
Q You stated that Freeman's shipments to the Wood

River plant of Illinois Power involved the by product dust, is that correct?

A I did, yes, sir.

Q GX-88 shows that this shipment amounted to approximately 116,000 tons in 1965, is that correct?

A Which plant are you referring to now?

Q The Wood River plant.

A Yes, sir, that's correct.

Q I suppose here again you are contending that the shipment was sold below cost?

A Yes, sir, I think so.

Q With respect to Freeman and UEC coal shipments to the Marquette Cement Company, you stated that UEC supplied the Oglesby plant of Marquette where it had the advantage of low transportation costs by river and that Freeman's coal went there, to their other plants of Marquette listed on GX-88, right?

A That's right.

[524] Q You stated that UEC could not compete for the business of those plants, is that correct?

A That is correct.

Q One of these plants is located in Milwaukee, is it not?

A That's right.

Q You are not contending, are you, Mr. Morris, that UEC does not ship coal to Milwaukee?

A No, but we never did to that plant.

Q GX-89 shows that both UEC and Freeman shipped coal to Marquette's Oglesby Plant in 1966, does it not?

MR. HEDLUND: I want to make certain if the witness has the document with the 1966 shipments before him.

THE WITNESS: Yes, I have it.

BY THE WITNESS:

A In 1966 this statement shows Freeman shipped to Oglesby 3,934 tons. Is that correct with your statement there?

BY MR. EISEN:

Q Yes. You are not contending that that is dust, are you?

A I don't know what it was. It was a small amount

of tonnage. It was insignicant. I didn't [525] even know it went in there.

Q Cement companies can't use dust, can they?

A Yes, they can use dust. Some of them can. Some of them can't.

Q Pardon me?

A I say some of them can and some of them can't.

Q To manufacture cement?

A I say some of them can use dust and some cannot.

Q Do you know whether Marquette Cement could use it?

A They tried it and it wasn't successful. This may have been a test. I don't know.

[526] Q I notice that Mr. Hedlund in asking you about the customers in GX-88 and GX-89 did not ask whether Freeman and UEC competed for the requirements of Commonwealth Edison's facilities. Were the sales set out in GX-88 and GX-89 to Commonwealth Edison by UEC and Freeman made in competition with each other?

A Everybody that can get a unitized train rate or get to the river and get a low river transportation cost can compete for Commonwealth Edison's business. Commonwealth Edison uses more coal than anyone else in the United States, I guess, except TVA, some 10 or 12 million tons a year, maybe more by now. I don't know. With that large volume of purchases, they reach out into many fields, always on the basis of the lowest transportation that they can secure.

So to that extent Crown, Indiana, Belleville, Fulton County, if they can get the right kind of transportation, can go into Commonwealth Edison's plants.

The delivered cost from those different fields vary somewhat, not to any large degree, because Commonwealth has too sharp a purchasing agent to let them do it.

That is my answer.

Q Without going through the mathematics of [527] totaling up these figures, approximately how much did you sell to Commonwealth Edison in 1966, as shown in GX-88?

A It shows here 1,777,000 tons.

Q You are reading from which one?

A '66. Do you want '65?
Q '65 is 1,543,127.
A Plus 51,000 tons from the Diamond mine, which made it 1,594,000.
Q Freeman sales were approximately what in 1965?
A Well, you would have to total these different figures here. There are about five stations and five mines. You would have to total them up.
[528] Q In 1966 they were 37,529 tons and 1,627,308 tons for the two stations mentioned there, were they not?
A You mean Freeman?
Q Yes.
A Whatever this thing shows is what it is.
Q Substantial tonnage, would you say?
A Yes. Big tonnage.
Q Was that dust that was going in there, Mr. Morris?
A No.
Q Mr. Morris, a coal company is limited, of course, by the amount of coal that it can produce, isn't that right?
A It certainly is.
Q And it will sell its production to the consumers from whom it can realize the greatest profit?
A That is a good business philosophy.
Q But this doesn't mean, does it, that a coal company's present consumers are the only consumers to which it can sell or to which it may sell at a profit?
A I didn't get the first two words of your question.

• • • •

[535] Q You say you were looking for someone to merge or buy out—
[536] A If we could find somebody in the strip industry who had some adequate reserves. We talked to some people, talked to anybody who had any land that we might get hold of. We went into all kinds of areas trying to find additional reserves, and that money was available any time we found anything like that.

• • • •

[541] MR. CUSACK: Your Honor, may I speak to Mr. Eisen for just one second?

THE COURT: All right, you may.
MR. CUSACK: Thank you, your Honor.
THE COURT: All right.
MR. EISEN: Thank you, your Honor.

BY MR. EISEN:

Q How much were you willing to spend to develop the Denmark Field?

A Whatever was necessary.

Q Approximately how much would that have been? Do you know?

A It would depend on the size of the mine you could put in, whether or not you had to pay cash for the coal, or whether it was on a royalty basis over an extended period, and a lot of things before you can determine how much cash it would require.

We never got far enough along in our discussions—we didn't make any progress for that matter—so I couldn't tell you what it would cost.

Q But at any rate, after this cash began to become accumulated in 1964, you did not put the money back into the business for whatever reason, right?

A None, no.

• • • •

[545] Q You testified at page 240 that Mr. Nugent and specially other members of the Board constantly asked you to exert every effort to get strip reserves which the company could utilize. Did Mr. Nugent ever ask you to get deep reserves?

A No, he did not.

Q You testified that while you were president of the United Electric you did not have to submit to General Dynamics in New York any approval of capital expenditure requests?

MR. EISEN: I think I already covered that subject matter, your Honor. I withdraw that.

THE COURT: All right.

BY MR. EISEN:

Q Mr. Morris, during the time that you were president, from 19—well, throughout your entire presidency

—the reserves of United Electric kept pace or out-matched the production for that period in each year, did it not?

A My recollection is that that is correct. I would have to refer to the figures to be sure.

• • • •

[579]

RECROSS EXAMINATION

• • • •

BY MR. EISEN:

Q Isn't it a fact, Mr. Nugent, that—I mean, Mr. Morris, so sorry.

A It's a compliment.

Q That they used to have to look for ways to dispose of gasoline before they developed facilities to consume gasoline, did they not?

A I don't know anything about it.

Q And wasn't natural gas at one time a waste product?

A I don't know anything about that.

Q You wouldn't know about that?

A No.

Q But dust, definitely, is an energy resource utilized today right along with other sizes of coal, isn't that correct?

A Yes.

MR. EISEN: Thank you.

THE COURT: Is that all?

MR. EISEN: That is all.

THE COURT: All right. Thank you. You are excused.

THE WITNESS: Thank you, your Honor.

MR. HEDLUND: Thank you, Mr. Morris.

THE COURT: You are excused.

• • • •

[582]

REUBEN THORSON,

called as a witness by the defendants, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Will you please state your name and profession, sir.
A Reuben Thorson, investment banker and stock broker.
Q And with whom are you an investment banker?
A Paine, Webber, Jackson & Curtis. I am a limited partner now, former chairman of the firm.
Q Formerly chairman?
A Yes.
Q Sir, would you try to keep your voice up; it's not a microphone, it's only for the court reporter.
A Okay.
Q Would you please briefly describe your education and business background.
A Well, I came to Chicago from the University of Minnesota in 1924, and have been on LaSalle Street ever since that time, been actively engaged in our business, financial affairs and formerly chairman of [583] the Midwest Stock Exchange and other things.
Q Thank you.
Q Were you a director at one time of the United Electric Coal Company?
A Yes.
Q When did you become a director?
A I believe October 30, 1959.
Q And how long did you serve?
A Until the consolidation with General Dynamics.
Q And when was that, if you recall?
A The middle or late '66, as I recall it.
Q Would you please describe the circumstances surrounding your election to the Board of United Electric?
A Well, Incorporated Investors in Boston, which is a large investment trust, owned about 10 percent of the common stock of United Electric, and there was a change in the Board structure of the company at the election of directors in the fall of—in October 1959, and the Midwest interests—Material Service interests nominated four directors and the incumbent management nominated four directors and Charles Devens the president of Incorpo-

rated Investors, apparently, was invited to have a representative on the Board and asked me to serve, and I was acceptable apparently to Mr. [584] Crown, and Mr. Devens wanted me to represent them on the Board. So, I was sort of backed into it, if you will, without any affiliation one way or another.

Q I see. Do you know, Mr. Thorson, whether or not Mr. Kolbe was in favor of the restructuring of the Board at that time?

A I had no prior knowledge prior to my going on the Board. Anything I might say there would be pure conjecture.

Q Do you have any knowledge of his attitude toward that, after you became a member of the Board?

A No, but I imagine human impulses are quite normal, and I could draw my own conclusions, but I haven't any specific knowledge of the subject.

Q Thank you.

MR. CUSACK: I move to strike on the grounds of hearsay his answer.

MR. HEDLUND: I don't believe the witness testified one way or the other.

THE COURT: I don't believe he testified one way or the other. What was hearsy?

MR. CUSACK: The answer only should be stricken then.

THE COURT: It may stand.

[585] BY MR. HEDLUND:

Q Mr. Thorson, when you came on the Board of United Electric, were you aware of any attempts or negotiations that had been under way—were then under way—looking toward a merger of United Electric with another coal producer?

A My knowledge of that is very slight. There apparently had been discussions prior to my coming on the Board with Truax-Traer. It was mentioned very briefly at subsequent Board meetings on two or three occasions, as I recall—it's some time ago now—but I thought that the conclusion that I drew without getting into it in depth was that United Electric was rather the suitor,

and the Truax was the unwilling bride, if I may put it that way, to-be, and the things just fell through, and there wasn't any great interest on the part of Truax, if I remember correctly.

[586] Q Do you recall any discussions after you came on the Board that you may have had with other directors about a possible merger of Freeman and United Electric?

A I never really discussed it to any extent with anyone. I think I did on one occasion, walking back to the office after a meeting with Mr. Ames, perhaps discussed it. I never discussed it with Mr. Nugent or certain other principal men of the situation. I knew of the stock interest building up in Material Service.

Q That is by Material Service?

A By Material Service at that time. Having been in the financial business all these years, I naturally assumed —if I can use that word—that ultimately there would be some discussions along those lines.

Q Would you have been in favor of such a merger had it taken place while you were on the Board of United?

A Yes, I would have.

Q Would you explain why?

A Well, there are two reasons. I think that United Electric had a strip reserve coal problem. I am no expert in the coal business. I want to make [587] that eminently clear. But these discussions came up, and the enlarging of the reserves was very difficult to achieve and they had real problems. I could see the assets wasting away and the reserves in Freeman, as I understand it, were substantially greater, and that one company might well augment or supplement the other.

In addition to that, I felt that the management that I had met, people at Freeman, were very imaginative and very sympathetic with our management, and it would have been harmonious and profitable and efficient.

[588] Q Did Freeman manage to have any capability that United Electric did not have?

A Well, I have the highest regard for—

Q I was not speaking, sir, in terms of personal com-

petency. I was speaking in terms of the operations at Freeman.

A I am not familiar with the operations of Freeman, only to the extent that I knew it was a very successful operation. I thought you were inquiring about the executive talent available.

Q At any of the board meetings which you attended do you recall any discussions of using the assistance of Freeman in mining deep coal by United Electric?

A Well, all I can say is that United Electric were strip mine operators, and I think their knowledge or capability in deep mining was somewhat limited, and I think that Freeman, from what I understand and from what Mr. Nugent and others said,—and he was certainly well qualified to say it—were very familiar with the problems of deep mining and offered the services in every way they could to be helpful to United Electric in that area.

Q Do you recall any particular field of deep coal [589] owned by United Electric?

A Well, there was an area where we, United Electric management was authorized by Amalgamated to acquire some properties contiguous to, I think, Round Prairie, that operation, some deep mines. It was suggested obviously that if they went ahead with that, Freeman would be very helful or perhaps would be very helpful in undertaking that project.

Q Do you recall why it was decided for the first time to disclose United Electric's owning of deep coal reserves in the 1961 annual report?

A Well, I was on the audit committee, and we looked at the audit and the annual report before it was printed. Freeman, being deep mine operators and Material Service having a substantial interest in United Electric, we, of course, attaching substantial values to underground reserves, thought that as long as we had the reserves they should be thrown in in a bulk figure of all reserves. It is a matter of full disclosure to stockholders, really, is what it amounts to.

[590] Q Mr. Thorson, do you recall the Board meeting at which it was decided that United Electric would pur-

chase additional reserves at the company's so-called Industry Field but only at farmland prices?

A I recall that. Not with any preciseness, but I remember that came up, and I remember the language was used, because I was always curious as to whether, knowing so little about the coal business when I went on this, as to what values attached to the land over and above the coal reserves underlying it, Industry Field was discussed as a long-range possibility and I can remember that the agreement was arrived at by the Board that they wouldn't purchase them over farmland prices, would pay no premium for that.

Q Do you recall whether or not Mr. Kolbe dissented from that policy at the time?

A I don't recall that he did.

Q Did you ever have any suspicion or knowledge of facts that Frank Nugent or the other Freeman-Material Service directors were attempting to operate United Electric for the benefit of Freeman-Material Service or indeed General Dynamics rather than for the benefit of all the stockholders?

A It never entered my mind.

[591] Q The Government contends in this case, Mr. Thorson, that after Frank Nugent came on the Board, United Electric was held back in purchasing additional coal reserves. In your opinion, based on what you learned at the Board meetings, or other contacts with the company, is there any justification, in fact, for such a charge?

A Not in my opinion.

Q You say there is not?

A No. The urgency of building up the reserves seemed to be one of the principal topics of discussion at every Board meeting practically that I attended, and Mr. Nugent was one of the first men to advocate the acquisition of additional reserves with anywhere near reasonable prices.

Q To your knowledge, did Frank Nugent or any other Freeman-Material Service director ever interfere with or try to block United Electric in making any needed capital expenditure?

A Certainly not. They were very substantial when I was on the Board.

[592] Q In your opinion did Mr. Nugent assist in making United Electric a vigorous, progressive company?

A I feel that he felt his responsibilities as a director responsible to all the shareholders of United Electric, and I think his intentions were honorable, and at the Board meetings I think they were all weighted heavily and completed in favor of General—United Electric Coal.

Q Do you recall, Mr. Thorson, what the tender offer price was for the stock of United Electric?

A $50 a share.

Q In your professional judgment, was that price reasonable and fair?

A I thought so. I still think so. There was a premium of about fifteen, sixteen, seventeen percent over the then market of 42, and I think that was a fair price—it was a generous premium in my judgment.

Q I would like, sir, your opinion of Frank Nugent's competency as a director of United Electric and as the chairman of its Executive Committee.

A Well, all I can say is that I have served on a number of Boards. I have told Mr. Nugent to his face on several occasions that he is one of the best informed men in his industry that I have ever had the pleasure of [593] meeting.

MR. HEDLUND: Thank you. That is all.

THE COURT: How long will your cross examination be?

MR. CUSACK: Your Honor, I really don't know.

THE COURT: You won't be through in five minutes, I am sure.

MR. CUSACK: I don't believe so. I don't think I will be through in a half hour, either.

THE COURT: Then we will recess until 9:00 o'clock tomorrow morning.

Do you have something?

MR. HEDLUND: Your Honor, I told Mr. Thorson that I thought we would be finished with him this afternoon. I have not consulted with him about his availability in the morning. I have not done that. I would

like to do that. If he is not available in the morning, I will just have to bring him back. We also have two witnesses from out of town in the morning.

THE COURT: You have out-of-town witnesses here. Ask the Government if they want to waive their right to proceed immediately on cross examination.

MR. CUSACK: Can we inquire of Mr. Thorson if he would be available at 9:00 o'clock.

• • • •

[595]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before the HON. EDWIN A. ROBSON, Judge,
Friday, April 3, 1970,
9:00 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM.

• • • •

[597]

• • • •

VICTOR H. WOOD,

called as a witness of behalf of the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name, sir.
A Victor H. Wood.
Q Mr. Wood, what is your home address?
A My home address is 1300 West 47th Street, Minneapolis, Minnesota.
MR. KEMPF: Could you please speak up a little louder.
THE COURT: That is not an amplifier. That is merely a tape recorder.
THE WITNESS: All right, sir.

BY THE WITNESS:

A 1400 West 47th Street, Minneapolis, Minnesota.

BY MR. KEMPF:

Q By whom are you employed, sir?
A Northern States Power Company, Minneapolis.
[598] Q What is your business address?
A Business address is 114 Nicolett Mall, Minneapolis, Minnesota.
Q What is your position with Northern States Power Company, Mr. Wood?
A My present position is Superintendent of Fuel Procurement, which entails the supervision of the purchase of all fuels for generation.
Q Mr. Wood, how long have you been with Northern States Power?
A I started in 1953 about 17 years ago, the first two years involved in power plant work and the last 15 years in the fuel procurement end of the business.
[599] Q Could you describe for us briefly, Mr. Wood,

the general area served by Northern States Power Company.

A Our major area is in the Twin Cities area of Minnesota, but we also operate in the eastern part of Wisconsin and the northeast part of South Dakota, and in a couple locations in North Dakota.

Q Did you say the eastern portion of Wisconsin?

A Yes. I'm sorry, the western portion of Wisconsin.

Q Mr. Wood, I would now like to show you Defendants' Exhibit 144, a map entitled "Investor-Owned Electric Utility Service Areas." This is the map which we have mounted on the cardboard here, and I would ask if you could point out to use the specific service areas served by Northern States Power Company.

A Our areas would be the areas in red marked 109, located in Minnesota, Wisconsin, South Dakota and these two spots in North Dakota.

Q Thank you, sir.

What fuel does Northern States Power Company use in generating electricity at its plants?

A We use a variety. We are using coal, bituminous and sub-bituminous coal, lignite, natural [600] gas, oil, and uranium, nuclear fuel.

Q Mr. Wood, I would like to hand you at this time Defendants' Exhibit 149, the 1968 Annual Report of Northern States Power Company, and I would like to refer you to page 3 thereof.

I notice that the last sentence of the paragraph at the top of page 3 states as follows:

> (Reading) "We also feel that the presence of nuclear power as a competitor has assisted us materially in controlling the costs of fossil fuels."

My question is, how does the presence of nuclear power assist you in controlling the cost of fossil fuels?

A Each time we have to make a decision on a plant, we must look at all the factors associated with the total cost of the generation, and this means that all fuels, including the nuclear, are in heavy competition with the coal in a selection of a plant site and a plant itself.

Q Has Northern States Power constructed any gas-fired generating stations in recent years?

A Yes, we have. We have erected two peak shaving, gas peak shaving plants in the last two years, [601] and one—both of these are gas turbines, and we have also changed our Pathfinder nuclear plant and converted that to oil just this past year.

[602] Q To oil?

A To oil and natural gas.

Q What is the kilowatt capacity of the plants to which you have referred?

A Approximately 200,000 kilowatts would be the total.

Q Do you have any existing plants to build additional gas-fired stations?

A Yes. We just announced a plan about two months ago that entails the installation of about 300,000 kilowatts in 1972 of gas peaking facilities in the South St. Paul area.

Q Do you have any nuclear stations under construction or planned?

A Yes. We have two stations, of which there are three units. Our one station is Monticello, which is located northwest of the Twin Cities. This is a 545,000 kilowatt unit.

South of the Twin Cities, near Red Wing, is our Prairie Island unit, our Prairie Island Plant, that is, which consists of two units of about 550,000 kilowatts each.

Q When is the schedule of operational dates of these three facilities?

[603] A The Monticello Plant will go in operation this year. The first unit of the Prairie Island Plant will be in 1972. The second unit will be in 1974.

[604] Q What led to the decision to build these nuclear stations?

A Again we looked at the over-all economics of the fuel and the plant, the plant site, and it was based on economics, and also environmental suitability and desirability.

Q In considering the over-all economic picture to which you have referred, did you consider specifically other alternative fuels?

A Yes. We considered coal, oil and gas at each of these sites.

Q You mentioned environmental suitability. Does Northern States Power consider environmental suitability to be an important factor in its decisions to build?

A Yes. This is a big factor in these times of making these decisions.

Q I would like to refer you at this point to the exhibit I handed you a short while ago, Defendants' Exhibit 149. I would like to refer you to page 18 thereof. Mid-way down the page, there is the headline which reads "We are a regional leader in air quality control," and the paragraph itself states:

[605] "NSP's commitment to controlling and improving air quality is second to none in the area. We've invested $8 million since 1942 in this voluntary program. During 1968 we converted our southeast plant in Minneapolis and the two oldest units in the High Bridge plant in St. Paul from coal burning to gas and oil fuel. We're carefully watching emerging technology for reducing sulphur dioxide emissions from coal burning plants so that we can determine when the new processes are practical. NSP's nuclear power plants also will make a major contribution to air quality. By 1974 35 percent of the company's total generating capabilities will be in nuclear units that do not produce dust or sulphur dioxide. By 1974 NSP will burn about 4 million less tons of coal annually than would have been required if coal burning units of comparable generating capacity had been built. That is a coal and sulphur dioxide reduction of 55 percent."

Are these plans still true as of this date?

A Yes, they are.

[606] Q How important are hydroelectric plants in the Northern States Power over-all system?

A They really are quite important. Our generation in 1968 amounted to about 7 percent of our total generation.

Q What year was that?

A In 1968.

Q Under what sort of purchasing arrangement does Northern States Power secure the coal which it does buy?

A By and large our coal is purchased under long term contracts, probably 80, 85 percent of the coal is purchased this way.

Q Of how long a duration are these contracts?

A We will go from five to ten years. In the last few years we have more or less pulled in our horns, and we are going at about five years due to the uncertainties of new generation and trying to remain as flexible as we can.

Q Where are the mines from which Northern States Power could secure its coal located?

A By and large the Belleville District of Illinois has been our natural source of coal. This is due to the favorable freight rate situation from the [607] district to the river and the biggest share of our coal has always come up on barge on the Mississippi to our plants. Most of our generation is located on the Mississippi in the Twin City area, so that it has been the Belleville area of Illinois that has been the major source. We do buy spot coal from the West Kentucky area and some from the Southern Illinois area, but they are not really competitive on a long-term basis with the Belleville area.

Q Are there any specifications which coal is required to meet if it is going to be used in your boilers?

A Yes. We have a broad range of specifications. We do try to design the boilers so they will handle a fairly broad range of coal qualities. This does not mean that we can handle all coals in every installation of ours. We have certain types of boilers which would have difficulty in burning certain coals within this broad range of quality that we design for.

[608] Q Suppose you try to burn Fulton-Peoria or Springfield coal, let's say, in your boilers.

A We have units where we could have severe problems due to the ash fusion temperatures or the ash content or the moisture content in burning the fuel and carrying the capability of the plant.

Q Do you have any specific occasions in which the use of coal which did not meet your boiler specifications did cause such difficulties?

A We had a specific case last year, 1969, where, in trying to burn some coal from the West Kentucky areas, some spot coal, we did manage to shut down one of our units, and this is a costly thing. We had to get in and get it back in service again.

Q Were you required to shift to some other type of coal?

A Yes. We had to shift to a coal that would not cause those problems.

Q Mr. Wood, what, if any, effect does the combined ownership of United Electric and Freeman by General Dynamics have on the competition for Northern States Power Company's fuel business?

A We feel it would have a desirable effect. [609] We feel due to the reserve situation that in our particular case we would be benefitted.

Q Why is that?

A Well, when we look for long-range—in the long-range competitive picture, one of the big things is to assure ourselves of the proper reserve situation. We don't go into contracts with those or consider them competitive under this situation unless they have the reserves to back it up, and we can count on them down the road. So that when you combine reserves, this is going to make a better situation for us on a competitive basis.

[610] Q You say combined reserves. You mean of United Electric and Freeman?

A Yes.

Q Do you have any examples, again, of the ways this might prove beneficial?

A Well, we recenty have entered into a contract with United Electric under which one of the features was to have the Freeman reserves backing up United Electric reserves so it made the package a competitive situation for us, and we were able to enter an agreement with them.

Q If United Electric had not had this back-up, would they have been in a position to bid for that portion of your business?

A Not for that portion of our business, no, sir.

Q Do you foresee any possible adverse effects because of the combination of Freeman and United Electric?

A No, we can't. We cannot envision any.

MR. KEMPF: No further questions.

THE COURT: You may cross examine.

* * * *

[612] CROSS EXAMINATION

* * * *

BY MR. FUTTERMAN:

Q But, as a general proposition, is it not true that as the coal comes up the river, you may assign it to one of your plants, depending on the reserve situation at that plant?

A No, sir. It is more a function of the rhythm of our unloading operation. I will have to explain it this way, too: In the summertime at three of our large stations in the Twin Cities area we are burning gas, natural gas. We burn large quantities of natural gas. So, we are not burning coal where it is a depleting thing. So, we have more or less a standstill situation where we could delay until fall, for example, taking coal in that particular station, even though its coal supply might look to be in jeopardy.

Q The gas that you consume in the summertime, that is interruptible gas, is it not?

A That is interruptible gas, yes. We have it available to us about seven months of the year.

Q As I understand it, your company, as well as distributing electricity, also distributes natural gas, is that correct?

A Yes.

Q The interruptible gas which you consume during the summer, is that supplied from your own [613] supplies or do you purchase that from another company?

A There is a portion that we receive from our own company in the St. Paul area, where we are the gas distributor, but in the Minneapolis area, where we have two of the three plants, we are serviced by the Minneapolis Gas Company, which is independent.

Q The gas that you consume from your own reserves, would you prefer to sell that to your firm rate customers, if you could?

A Will you repeat that question?

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A I'd have to say yes, if there were a need on a firm basis. There is a higher revenue factor in selling firm gas to residential type customers.

Q Because that provides a higher rate of return—

A It's a—

Q (Continuing)—or a higher profit.

It is true, is it not, that when you make a contract with a gas pipeline company, that you must take gas throughout the entire year regardless of whether or not you may have a demand from your own customers for [614] that gas?

A That's right.

Q That is really the reason why you consume the gas in your own boilers, you have to keep taking it throughout the summer months?

A This is not entirely true. There is a certain amount of revenue that accrues to the pipeline as a result of selling interruptible gas in the summertime that does eventually help the firm gas customers. Our gas rates in our area for interruptible gas are quite low, and we are only assured of gas during the period when there is absolutely no firm load or even other steps of curtailment. In our area we have maybe six different steps of curtailment based upon temperature. Our step that we're on is one where we are the very first ones that are knocked off when the weather changes, and we are the very last ones to come on. For that, having that inconvenience, we are afforded a good price, and this is the reason it is a competitive thing for us.

It's still, even at that low price, there is an incremental savings to the pipeline itself, which in turn is passed on to the customers in effect because it's a revenue addition.

[615] Q If you were to tell the pipeline company that you could not take the gas during the summer months, would you have to pay a penalty to the pipeline company?

A No. No, we don't. They are actively soliciting our business for this type of service, this type of sale.

[616] Q Has there been an increase in the market for gas for air conditioning units in the summertime?

A There has been a fair increase, right, in our area. If I may explain our gas situation, up in our area we have a tremendously high peak of natural gas use because of the servere winters. So this, in turn, gives quite a large valley, what you call valley in the natural gas man's language, which this valley is where we obtain our interruptible gas, so that we perhaps have more interruptible gas available in our area than you would have in other areas, due to this high peaking tendency.

Q Isn't it true that in 1968 you experienced a curtailment of interruptible gas supply?

A We had it; not in the Twin City area. We had more curtailment in some of the smaller communities where we use natural gas as boiler fuel, where their firm load in relation to the summer load is not as great. In other words, a less of a valley existed so there was not as much gas available to us, and as the summertime gas requirement increases, well, it pushed us off on this low interruptible step.

Q As a general proposition, interruptible gas is not available to you during the winter heating [617] season, is that correct?

A That is correct.

Q Is it not true that the gas turbine plants which you spoke of on your direct examination are peaking plants?

A Yes, they are peaking plants but our experience has been, with the load situation and the way it is going, right now, that we tend to have them on the line much more than we had ever planned, and this seems to be the trend, where they are used for peaking but then there is also a certain number of hours during the day now that we are actually carrying it for load-carrying purposes.

Q It is true, is it not, that Northern States Power has shut down approximately 19 hydro plants over the last

ten years because they were uneconomical to continue in operation?

A Yes, that is correct. We started out as a hydro company in the State of Wisconsin at the very early days of our company, and the units that we are shutting down in the main are these smaller, older units that were at a point where they required considerable maintenance, and now we are relying on our newer hydro developments with larger capacities to continue [618] on with the hydro increment of load.

* * * *

[620] Q You did not consider interruptible gas for either the Monticello plant or the two units to be built at Prairie Island, is that correct?

A We looked at natural gas for both of them on an interruptible basis, which would be natural gas coupled with coal in the wintertime.

Q Could you have fueled all three of those units exclusively on interruptible gas?

A On an interruptible basis?

Q Yes.

A No, we could not have.

Q Would it have been economically feasible to fuel all three of those plants with firm rate gas?

A No. No, it wouldn't. Firm gas in our area would be much too expensive.

THE COURT: Can you hear the witness?

MR. HEDLUND: I am having a little trouble.

THE COURT: Would you speak up just a little louder so all the counsel can hear you.

THE WITNESS: I'm sorry.

THE COURT: Thank you.

BY MR. FUTTERMAN:

Q Mr. Wood, just recently your company announced some additional plant expansion for 1976 to 1977, is [621] that not correct?

A Yes, that's correct. In 1976 we are going to put in a 600 megawatt or 600,000 kilowatt generating unit.

Q That will be coal fired, will it not?

A This will be a coal fired unit, yes.

Q Do you expect that these units will encompass some type of a sulphur dioxide emission control system?

A When we looked at this unit, and as we do all, we consider nuclear, oil, bituminous coal, sub-bituminous coal. In this particular case we are looking toward the west for low sulphur coal. Although we did look at the bituminous coal out of Illinois with the idea of putting in sulphur removal equipment and trying to match the cost up in a competitive situation between the western fuel, we feel that as time goes on and these—this sulphur removal equipment becomes available and practical, that the two coals can compete, but as it stands right now, the western fuel seemed to be the competitive choice, the low sulphur western fuel.

Q Where will that western coal be coming from?

A We have no decided or made any contracts [622] yet, but it will be either out of Wyoming or Montana.

Q Is it possible that if a feasible sulphur dioxide emission control system is developed, you would consider fueling the new unit with midwest coal?

A Well, here we have a timing problem because you have to start designing boilers well in advance of the unit. For a 1976 unit, we will have to start next year in making some final design decisions, and so we will not have the time to wait until we are assured that an SO_x removal system would be available. At this stand, we would rather doubt that it would and that there would be one that we could put in.

Q At the present time isn't Northern States Power experimenting with a sulphur dioxide emission control system?

A We are involved with others in the Babcock and Wilcox SO program in study only.

Q You testified on direct examination, I believe, that your total coal burned will be cut by about 4 million tons in 1974. When the new unit comes on line in 1976, how many tons of coal will that be consuming annually?

A Western coal with its relatively low heating value, it will consume about 2.5 million tons a year.

[623] Q How many units do you anticipate will be encompassed within the next coal fired expansion?

A I don't quite understand your question.

Q Are you just going to have the one 600 megawatt unit?

A Yes, sir, we have the one unit, the only one announced.

Q That one unit would consume the 2.5 million tons of coal?

A That is correct.

Q On your direct examination you testified about, I believe, your concern with air pollution. Is it not a fact that the air pollution ordinances enacted by Minneapolis-St. Paul area do not restrict the sulphur content on coal consumed?

A That is correct, not on the coal going into the boiler. They have the restriction on the SO_2 level at ground and also on the particulate matter going out the stack.

Q In order to control the SO_2 ground level emission, you can construct a very high smokestack, can you not, so that there is a wider dispersal of the SO_2 emission?

A That is correct.

[624] Q You have, in fact, done that at some of your plants, have you not?

A We have a high stack on the King plant which is our last new fossil plant, that's right, and we are in the process of adding a higher stack in the Twin Cities area.

[625] Q In order to control the particulate emission, you can install electrostatic precipitators on your plants, can you not?

A That's correct.

Q Have you done that at certain of your plants?

A We are in the process right now in one of our Twin City plants to do this, to add both the tall stack and a new precipitator.

Q This will enable you to continue to burn coal with a relatively high sulphur content, is that correct?

A Yes, that's correct.

I might say at this point, however, that in conjunction with the tall stacks and the precipitators, we are trying to blend the Western fuels, which are most readily accessible to our area, in these plants so that we do not only meet regulations, but we improve on the regulation.

Q You are blending the Western coal with coals you purchase from Illinois—

A Right.

Q (Continuing.)—and West Kentucky?

A That's correct.

Q Is it not true, Mr. Wood, that some of the Western low sulphur coal which you have purchased was [626] not purchased specifically for complying with air pollution ordinances, but rather was purchased in order to fulfill coal requirements for some of your plants?

A Yes, that is right. We are probably one of the closest large users of coal to this new area in the West, and we have burned lignite in our North Dakota plants for years, and we are just trying to expand on this new source of fuel.

Q Some of the Western fuel that you are purchasing would be burned in your North Dakota plants?

A We are not now planning to do so, no.

Q Is it not also true, Mr. Wood, that in recent years you have been able to locate your generating facilities further away from the population centers which these facilities serve?

A Yes. We are, as most utilities, moving our generation out away from the metropolitan areas, as well as our transmission line networks.

• • • •

[631] BY MR. FUTTERMAN:

Q Mr. Wood, do you anticipate that high sulphur coal produced in Illinois will continue to be burned both by your utility and other utilities?

A We are quite optimistic that within the next three to four year, with all the effort and money being spent in looking at sulphur removal equipment, there will be one that comes out to be the bellringer, and that the Illinois bituminous coal with its relative higher sulphur content than the western coals will be just as competitive as it is right now, so that you will have the competition and also the reduced sulphur emission.

Q In regard to your Monticello nuclear plant, that is about 40 miles northwest of Minneapolis, is it not?

A Yes. That is correct. Right on the Mississippi River.

• • • •

[637] Q Mr. Wood, isn't it a fact that the price Northern States Power Company pays for coal is determined by the BTU value of the coal and the transportation charges?

A Yes, it is. That is correct. We do, however, when we are analyzing coals, have certain adjustment factors that we apply to the delivered cost that relate to how they will be utilized in our boilers, such as efficiency or ash-handling characteristics, the sulphur, this type of thing, where we have a direct operational cost penalty or benefit by burning different coals.

Q You have on occasion purchased coal from the Little Dog Coal Company, have you not?

A Yes, we did, several years ago.

Q That is neither the Belleville or the Southern Freight Rate Districts, is that correct?

A No. That is the Springfield area, I believe, the southern area of the Springfield area.

Q Mr. Wood, you testified on direct examination, I believe, that the Pathfinder Plant of Northern States Power was originally scheduled to be a nuclear plant.

A That is correct.

* * * *

[657] BY MR. FUTTERMAN:

Q Mr. Wood, as a general rule, have there been greater delays associated with the construction of nuclear plants than with the fossil fuel plants?

A There is a tendency to be a greater delay in the last few years. We are not experiencing this ourselves to the same degree as some of the more publicized units have. I believe we have probably benefitted from some of the things that have gone on before. So, our Monticello plant we are looking at perhaps being in the three-months delay category.

Q Mr. Wood, would freight rates from the McDonaugh-Schuyler County area be more favorable to Northern States Power than freight rates from the Fulton County area? Again, if you would care to refer to the map, you may do so.

A I believe, if you are looking at a barge movement, they perhaps could be, where you could move [658] the

coal directly to the Mississippi. Out of Fulton County by barge you must go down the Illinois River and come back up again which is a more costly movement. It would be difficult to say at this stage because you need—a big movement of coal is needed to generate a good economic situation at a dockside. It isn't just a matter of moving the coal to the river and then dumping it. It's an organized—you have to develop a sound plan and get in with large tonnages and unit train concepts, so it is a little hard to generalize on the situation.

[659] Q Mr. Wood, is it not a fact that utilities have not always purchased coal under long-term contracts?

A That is right. We purchase on a stock basis occasionally to fill up the valleys we have in our fuel program.

Q Has there not been a trend toward long-term contracts due to the fact that coal demand has increased so as to create a seller's market?

A This perhaps has happened in other areas; not in our area it hasn't. Our desire for long-term coal contracts is still the same. As I mentioned, we burn considerable amount of natural gas in the summertime, and we must have a sound enough position in our coal purchase program so that we can jump in and take over in case either one of the fuels is not available to us, and we also think of our distance. We are one of the furtherest large utilities from its source of fuel, and we feel that the term contracts in both coal and transportation give us a certain security on the long-term basis.

Q Is it of benefit to your company to have a number of coal suppliers soliciting your business?

A It's is a definite benefit to have a number of [660] sound, reliable, suppliers, yes. There is not distinct benefit in having a great number of suppliers, but to have the type that give us the foundation for a sound fuel program, yes.

Q You stated, I believe, that the Northern States Power entered into a contract with United Electric whereby Freeman would provide back-up reserves, is that correct?

A Yes, that's correct.

Q When United Electric ceases to supply coal to North-

ern States Power on this contract, then is it true that the Freeman reserves, which may be used, would be used for the same purposes and in the same generating facilities?

A Yes, that is correct, generally speaking. We have many units, as I stated before, in these generating facilities that can receive the barge coal, and we always put the coal—if we can—we will try to put the coal in the best unit possible, providing we can keep this flow moving. We have a set of plans where a checkoff list as coal comes up the river, but the first one, of course, is to keep the flow moving in a good rythm. The second one is to try to get the coals in the units that they would be best [661] designed for.

So, you might not be able to put them in or you might not want to put them in the exact same units, but it would follow in the same pattern.

Q Sometimes you cannot always put the coal into the unit which it is best designed for, is that not correct?

A That is correct.

Q You stated that your ability to use nuclear fuel assists you in controlling the cost of coal. Is it not a fact, Mr. Wood. that competition among your coal suppliers has not been able to control the cost of coal to Northern States Power?

A May I have that question again?

THE COURT: Read the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A Certainly competition between coal suppliers is a big factor, but I believe overriding this, which sets the overall competitive picture, is the alternate fuel competition. There is competition among all fuels as well as among coal suppliers.

Q Mr. Wood, when did you arrive in town?

A I arrived yesterday afternoon.

* * * *

[664] REDIRECT EXAMINATION

BY MR. KEMPF:

* * * *

Q You also referred to the fact that these peaking stations are used to a large extent within your system. During my direct examination you referred to the fact that your newly announced gas turbine station will be 300,000 kilowatts. Is it not a fact that that plant size exceeds many of your older coal burning stations?

A Yes, that's true. Our next to the last fossil unit we put in was a 250,000 kilowatt machine, which is a relatively new machine, and here's one package of gas turbines that exceeds that.

Q Mr. Futterman asked you the question of whether or not the new Monticello nuclear station would be a base load station and you answered him that it would be. He then asked you that because it is a base load station, would that not reduce the amount of oil and gas burned at your other station, and you said that for about a year period it would.

My question to you is: would this affect coal along with oil and gas?

[665] A Yes, it does. It would affect coal immediately, and, due to the inherent lower incremental cost of a nuclear plant, you will tend to operate it more than you would a corresponding fossil plant, so it would have an additional effect on the coal use.

Q You referred during the course of your cross examination to a 600,000 kilowatt coal-fired station which is planned for around 1976, and you indicated to Mr. Futterman that the coal to be burned in that plant would be coming from the western portion of the United States, and I think it was clear during your cross examination that this is low sulphur coal, is that correct?

A That is correct, low sulphur bituminous coal.

Q Just so that the record is clear, how would you characterize the sulphur content of the coal from the Belleville region?

A Insofar as magnitude or in term? We would classify this as a high sulphur fuel.

Q You discussed electrostatic precipitators during your cross examination. Those do not concern themselves with the removal of sulphur, do they?

A No, they don't, although I think we must say [666] that part of the reason for adding precipitator capacity is that the lower the sulphur is actually works against the use of a precipitator. The lower the sulphur is in fuel, the harder it is to collect the ash, so you must increase the capacity of your ash collection system as you decrease the amount of sulphur in the fuel.

Q I see.

So, as you solve one air pollution problem, you make it harder to solve the other one.

A You create another one.

[667] Q You referred to both high stacks and electrostatic precipitators as the possible additions to your plants, which would enable them in some cases to continue burning coal.

My question to you is: are these low cost or high cost items?

A We feel that they are relatively low cost items in comparison to other things that we are doing.

Q Such as?

A Well, such as, well, in new plants, figuring, trying to anticipate SO_2 removal costs and things of this type. This is the best thing to do, for example, at an existing plant. In an existing plant, you cannot just add all of this equipment and expect to make it work.

Q I see. I am sorry. I did not mean to interrupt you.

A (Continuing.) This putting in a stack and precipitator, you are able to do this with minimal disturbance to the plant itself, and yet have part of the desired objective.

Q So, they are low cost in relation to the probable cost of future sulphur removal processes?

A That is correct.

[668] Q In an absolute dollar value sense, are they low cost or high cost items?

A Well, in the case of our conversion of the Riverside Plant that I mentioned where we have announced putting a facility, we are looking at a $2 million expenditure for a combination of stack and increased precipitation.

Q That is at one facility?

A At one facility alone.

Q Is this increased cost of existing technology and the probable cost of future technology another factor considered in the over-all analysis of deciding what fuel and what type of station to install?

A That's correct. This was a factor in the selection and analyzing of our 1976 unit.

Q Mr. Futterman raised with you the subject of receipt of shipments at some time in the past from the Little Dog Coal Company. Do you know whether that company is presently in operation?

A As I understand, they are not in operation now.

Q Did you buy any long-term coal from them?

A No, sir, it was strictly a spot purchase over a couple year period.

• • • •

[669] BY MR. KEMPF:

Q Do you feel that your experiences with the Pathfinder nuclear station prior to its conversion [670] to gas were beneficial to the company in its over-all planning of future nuclear sites?

A We can definitely say that it was. We probably wound up with one of the best trained organizations to fill spots in our plants of any company in the country, and we gained experience in licensing matters and dealing with the various departments in the AEC, so it was a definite benefit.

• • • •

[671] Q Is it not a fact that if the breeder [672] development which you and others are participating in is, in fact, developed, that it will have a definite impact on the question of the supply of uranium for the future?

A Oh, yes. That's very true.

Q My final question, Mr. Wood.

Mr. Futterman asked you about the importance of having coal companies competing for your business, and you said that you thought it was important to have sound companies. I do not mean to short-circuit or summarize your answer, but I believe the gist of it was that it was

important that you have sound companies to be in a position to bid for your business.

My question to you is: would you consider United Electric Coal Companies standing alone at this time to be such a company?

A Not with the reserve situation the way it is. We would not feel that way. As our contract shows, in our long-range thinking, we must throw in another factor of reserve reliability.

MR. KEMPF: I have no further questions, your Honor.

THE COURT: Is there any recross?

MR. KEMPF: Oh, your Honor, I do have one.

* * * *

[676] RECROSS EXAMINATION

BY MR. FUTTERMAN:

* * * *

Q Mr. Wood, isn't it a fact that the breeder reactor is at least 15 to 20 years off in the future?

A Yes. We are looking in the mid-1980's before we would have a unit that we would look at for commercial purposes.

Q Isn't it also a fact that the estimate as to when a commercial breeder reactor will be available has just been pushed back by the Atomic Energy Commission?

A I am not aware who has done it. I have been reading, and in my reading I take it that we have a period of delay here. But it is not a significant period. It is consistent with the reserve situation and what is going on, we feel.

Q Isn't it a fact that the longer the breeder reactor is delayed, the more critical the problem of a potential shortage of low cost uranium becomes?

A Yes. But in commercial circles when you start getting close to the bottom of the barrel, somebody comes up with a new scheme. What I am saying is you watch this, and as soon as it becomes quite apparent that we do have a problem in uranium, I am sure the breeder program would speed up naturally. There has been

tremendous success in 1969 in finding [677] low cost uranium, so this perhaps could be one of the factors in delaying a little of the thinking and money spending for the breeders. It becomes an economic thing.

[678] Q Mr. Wood, your company will continue to burn coal from the Belleville and Southern freight rate districts, will it not?

A Yes. For as long as it will remain competitive and available enough in supply so that we can count on it for long-term purposes.

Q That is generally high sulphur coal, is it not?

A Yes.

Q Mr. Wood, you testified that United Electric alone would not be a sound company because of its reserve position. How do you know about United Electric's reserves? Where did you get that information?

A I think just information that we gathered in the normal course of fuel procurement practices, in talking to the operators, in hearing about operators from others. It is just a matter of gathering information in the circle of business.

Q You never examined any of the reserves books of United Electric—

A I don't recall. I might have, but I just don't recall now.

Q Would most of the information you received about United Electric's reserve have come from other parties?

[679] A Not necessarily, no. This is a marketing judgment you make, and there are other companies that have showed reserves and perhaps United has with us. But it is our feeling that this is the position, and so this is the reason for our concern.

Q Mr. Wood, has United Electric ever offered to supply you with coal from the Perry County area in the Belleville district other than from the Fidelity coal mine?

A To my knowledge, no.

Q Assume that United Electric had a reserve field of 30 or 40 million tons of strip coal reserves which has not yet been developed; would it still be your position that United Electric is not a sound company and lacks reserves?

MR. KEMPF: I am going to object, your Honor, unless he specifies where this is located.

THE COURT: All right. Reframe your question.

[680] BY MR. FUTTERMAN:

Q Assume United Electric has a reserve tonnage of 30 to 40 million tons in the vicinity of the McDonough-Schuyler County areas. Would it still be your position that United Electric is not a sound company because it lacks reserves?

A Yes. It could very well be my position. You have to know the cost of mining that coal and to see if it would fit into the picture. Perhaps it would not be competitive in our market. So even with reserves as far as Northern States Power is concerned, they would be of no use or would not be competitive over the long pull to us.

Q But those reserves might be of value to some other utility, isn't that true?

MR. KEMPF: I am going to object, your Honor. This witness is being asked about his utility.

THE COURT: The objection is sustained.

MR. FUTTERMAN: Excuse me just one minute, your Honor.

THE COURT: All right.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

• • • •

[683] MR. FUTTERMAN: Your Honor, at this time I would move to strike Mr. Wood's responses in regard to United Electric's reserves on the ground of hearsay.

THE COURT: It is not hearsay. It is investigation looking at books, and so on. The motion is denied.

MR. FUTTERMAN: No further questions, your Honor.

THE COURT: The Court would like to ask one or two questions.

This power pool that you spoke of, when did it come into existence?

THE WITNESS: This would have been about four years ago.

THE COURT: What companies are in that?

THE WITNESS: Just to name a few: Commonwealth Edison, Union Electric, Wisconsin Electric Power, Wisconsin Public Service.

THE COURT: That is primarily in the middle west?

THE WITNESS: Yes.

THE COURT: Are there any figures available that you know about as of the date that this power pool came into effect, which is four years ago, as to the percentage of gas, oil, coal and atomic energy that were used as fuels in this group?

THE WITNESS: This group, which is called MAPP, [684] or Mid-Area Power Planners, is a nationally recognized group, and they have published data. I am not aware of that, but I know they have published it.

THE COURT: Is any part of that in the record?

MR. KEMPF: I do not believe it is, your Honor, but we can attempt to supply it.

MR. FUTTERMAN: Your Honor, I might say that if Mr. Wood would be able to give us the names of the utilities, all of the utilities involved in this group, we have an exhibit in evidence entitled "Steam Electric Plant Factors," which lists for each individual utility total gas consumption, oil consumption, and coal consumption, and I believe nuclear consumption.

THE COURT: And that covers it?

MR. FUTTERMAN: Yes.

THE COURT: For what period?

MR. FUTTERMAN: We have the 1968 edition, and I believe that would cover it for the year 1967.

MR. KEMPF: We also have it for 1969, and I believe a couple of the deposition exhibits trace it further on.

THE COURT: Is there anything projecting this—their estimates are I believe to the year 1980. Is there anything projecting it to that period?

MR. KEMPF: I do not think there is a specific [685] time that far down the road. There is one section in each edition that lists announced plants for the future in terms of gas, turbine, oil and atomic energy.

MR. FUTTERMAN: And coal.

MR. KEMPF: And coal.

THE COURT: Then that answers my question. Thank you. I have no question on that.

MR. KEMPF: We have no other questions.

THE COURT: Thank you, sir. You are excused.

(Witness excused.)

[686] THE COURT: You may call your next witness.

MR. HEDLUND: The defendants call Mr. Davis.

A. H. DAVIS,

called as a witness on behalf of the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Will you please state your name and occupation?

A My name is A. H. Davis. I am the president of Central Illinois Light Company.

Q This came as somewhat of a surprise to me, Mr. Davis. When were you made president of Central Illinois Light?

A March 26th.

Q Of this year?

A Yes.

Q My congratulations to you.

A Thank you.

Q Central Illinois Light Company is frequently referred to as CILCO, is that correct?

A Yes.

Q C-I-L-C-O?

A Right.

[687] Q Would you please describe briefly your education and business experience.

A I received the B.S. and M.E. from Bradley University in 1948, at which time I started to work for CILCO. From there on in, I worked through various construction and power production responsibilities. In 1960 I was made general superintendent of electric pro-

duction and transmission. In 1967 I was elected vice president of operations. In 1968 I was elected to the board of CILCO. More recently I was made president.

I am a director of the University National Bank of Peoria, a director of the Proctor Hospital of Peoria and a commissioner of the Public Building Commission of Peoria.

Q During your experience with CILCO were you familiar with the coal buying practices of the company and the fuel purchasing policies?

A Yes. As vice president of operations that was one of my responsibilities of overseeing the coal purchasing.

Q Mr. Davis, I wonder if I could ask you to indicate on Defendants' Exhibit 144 the service area of CILCO?

[688] A We are in the central part of Illinois, the blue color, No. 19.

Q Would you please describe briefly the facilities and operations of CILCO?

A CILCO, as I said, is located in the central portion of Illinois. We are divided into a Peoria Division and a Springfield Division.

Our area of service covers about 2,500 square miles. We are a combination company, providing both electricity and gas.

We have an electrical capability of about 863 megawatts, and we have a gas system of some 2,200 miles of main which services both areas. We serve about 100 communities. These communities in our area have a population of about 500,000. We have 130,000 electric customers and about 42,000 gas customers. This past winter we had a gas peak of 359 million cubic feet.

[689] Q In terms of electrical generating capacity, how does CILCO rank within the state of Illinois?

A We are the fourth largest electrical utility in the state.

Q Who would be the largest?

A Commonwealth Edison.

Q Would you please describe the characteristics of your electric generating stations.

A We have five electric generating stations. The smallest is a gas turbine station consisting of two 16

megawatt gas turbines. The next station and our oldest is our Liberty Street station, located in the city of Peoria, which we are in the process of retiring.

Q If I may interrupt you, why have you decided to retire that station?

A Well, the air pollution control regulation kind of pushed the economics of operating this station—it is an old and rather obsolete station and rather small, so the economics of putting on air pollution regulation control equipment just wasn't economically feasible.

Q What control equipment would you have had to put on?

A Particulate control. Precipitators.

Q Please continue with your description of your plants.

[690] A Our next station is our Keystone station, which we recently purchased from the Keystone Consolidated Industries.

Q Where are they located?

A They are located just south of Peoria in Bartonville. We are converting that station to gas or half of it to gas and the other half is going to be put on cold standby.

Q Did you say cold or coal?

A Cold.

Q C-o-l-d?

A Right.

Q Would you please tell me why you have converted this station to gas?

A We can more economically serve Keystone from our nearby generating facilities, so we are shutting down the station to utilize our more economical stations.

Q Are you, however, keeping a portion of that plant operable on gas?

A Yes. And that will be used to serve the steam requirement of Keystone.

Q Would you continue, then, with respect to your other facilities?

A We have the R. S. Wallace station in Peoria, [691] which has a 359 megawatt capability. There we have 10 boilers, 4 of which have been converted to gas. We are now converting 2 others to gas to comply with the air pol-

lution regulations. We cannot put electrostatic precipitators on these boilers economically.

The last four boilers will continue to burn coal. They do have electrostatic precipitators.

Our E. D. Edwards station, which is located just south of Bartonville, is approximately 400 megawatts in size. It is coal burning. We have precipitators on the boilers, and we currently are adding a 350 megawatt unit to the station, which will burn coal.

[692] Q As I understand it, your largest station at the time without regard to this addition, is your existing Edwards Plant which has a capacity of 400 megawatts?

A That is correct.

Q Have you in the past or in the recent past had another generating station or a generating station outside of the Peoria area?

A Yes. We had a power plant in Springfield, Illinois, a smaller plant, that generated electricity and also provided steam to the City of Springfield, as does our Liberty Street Station. We serve some 300 customers in Peoria, but we have since retired that Springfield station.

Q So that it is the fact that at the present time you are not burning any coal at all in Springfield, is that correct?

A That's correct.

Q Do you recall, oh, say in 1966 or in 1967 who was serving the Springfield Plant, which coal suppliers, if you recall?

A The Springfield Plant was served by Freeman.

Q From which mine?

A I believe it was the Crown Mine.

[693] Q Do you know what freight rate district that would be in?

A That would be in the Springfield Freight Rate District.

Q Other than the addition being constructed at the Edwards Plant, what plans have you for further additions to your generating capacity?

A We currently have under consideration a 400 megawatt unit to go into service in either 1975 or 1976 at a site that we have not determined as yet.

Q What fuel is this station likely to use?

A We would prefer the station to use coal. We would make an economic analysis of the oil, gas and other fuels before we made that determination absolutely.

Q Will air pollution considerations enter into your ultimate decisions as to the fuel in that station?

A Well, we would have to study the effect of the air pollution regulation at that time and consider the economics of the various fuels and the cost of providing control equipment and then determine just what fuel we wanted to use.

[694] Q Is there a possibility that this station or unit to which you have just referred or subsequent stations built by CILCO might use nuclear energy?

A We have studied the nuclear energy field, and to date we are installing units of such a size that it is not economical to install or think about installing a nuclear unit. For the most part, the size requirement is about 750 or 800 megawatts, especially in our area where coal is relatively cheap.

Q Approximately how many tons of coal per year does CILCO presently consume?

A During the year 1969 we consumed approximately 1,600,000 tons of coal.

Q Will you please tell me the manner in which CILCO purchases its coal?

A Well, for many years we have purchased coal on long-term contracts of five to twenty years.

Q What was your most recent request for bids from coal producers in terms of tonnages and lengths of time?

A For the unit that is going into service in 1972, we requested bids from the coal producers for twenty years at a million tons per year.

Q In other words, that was a request for 20 [695] million tons of coal?

A That's correct. We are actually buying reserves.

Q Why do you choose to purchase coal under such long-term contracts?

A Well, we are spending $50 million for a coal burning unit. This unit is a large portion of our total capability, and we would like to assure ourselves that we have the fuel for at least 20 years.

Q To what extent have you presently contracted for —may I rephrase that? To what extent have you presently bought all of your coal requirements for your existing stations?

A We currently have our coal requirement provided for, for our existing station and the units going into service in 1972, for a period of 20 years.

Q For a period of 20 years?

A Yes.

Q Do you purchase coal on the so-called spot market?

A Very rarely. The spot purchase of the coal has little interest to us. Our coal for the most part comes from the Peoria-Fulton County freight rate district. If we spot purchase coal it is usually out of that [696] district and we have to pay a higher transportation charge.

Q If the generating station or the addition planned for 1976, that is the generating station—if the generating station planned for 1976 ultimately utilizes coal, what would your expectations be with respect to the source of coal supply for that station?

A We would certainly hope to find the coal in the Peoria-Fulton County area. However, the reserves in that immediate area are diminishing. Other than that, we would hope to find coal just out of Springfield. Our preference would be the Peoria-Fulton County area, because of the transportation cost. For the most part, the coal has about a 30-mile haul to us. So staying right in that freight rate district is very beneficial to us.

[697] Q But you expect for this station to be supplied by one or more than one supplier?

A We would prefer one supplier so we could have the transportation economies. However, if the reserves were not available to one supplier, I suppose you could consider two. But one supplier is by far the best.

Q Can your coal fire generating plants consume coal produced anywhere in Illinois?

A No. I wouldn't go so far as to say you could use coal that was produced anywhere. We could fire coal that is produced within a certain chemical range, ash composition, fusion temperature and other characteristics, but

beyond that, if you don't have that chemical range, you get into trouble.

Q Are your boilers designed with a particular coal in mind?

A Our boilers are designed to utilize No. 5 and 6 seam coal out of the Peoria-Fulton County area.

Q Do you recall that CILCO received a questionnaire, a subpoena questionnaire, sent out by the court, do you?

A Yes.

Q If the characteristics of the coal burned [698] are so important, can you explain why in answering the subpoena questionnaire issued by the court an indication was given that there were no specifications as far as CILCO was concerned as to coal size, ash percentage, moisture content and so forth?

A We had been burning the Peoria-Fulton County coal for many, many years, so we are very familiar with the No. 5 and 6 seam characteristics. We do indicate, and perhaps it was an oversight on our part if we didn't indicate it, we do indicate the size and that the coal is washed. So all in all, when we purchase coal, we indicate this seam, the mine and the sizing of the coal and that it be washed.

Q In your judgment does coal compete with other forms of energy as a fuel source for the generation of electricity?

A Oh, yes. Coal is competing with gas and oil, and in our Peoria area we have four customers that are seeking to convert to gas their industrial power plant, which they produce both steam and electricity in. We have one customer that is interconnected with us, who operates in parallel with us, that has generation of 16,500 kilowatts. We don't expect them to continue to burn coal. This is the Corn Products Corporation in Pekin.

[699] Q The Pekin plant of Corn Products?

A Yes. We recently had the American Distilling Company in Pekin make a contract with us to purchase gas to convert their coal-burning facility to gas.

Q Which facility of American Distilling?

A That is also in Pekin.

In Peoria we have the Hiram Walker plant, which recently signed a contract with us for 5 million cubic feet of gas per day to start the conversion of their facilities.

Q From what fuel to what fuel?

A From coal to gas. We are interconnected with Hiram Walker, and all these companies. We serve a portion of their electric requirement already. The American Distilling and Corn Products plant. And then we have the Standard Brands plant that we furnish up to 50 percent of their electrical requirement. They are negotiating with us currently to convert their coal-burning facility to the gas.

So I would say the industrial use of coal in the very near future will be converted in our area to gas.

Q What about inter-fuel competition with [700] respect to electric utilities? Do you believe coal competes with other forms of energy?

A Yes. Very definitely. We have gas turbines. There is oil being used. There is nuclear fuel. There is gas. Just about all of the types of fuel are being used in competition with coal.

THE COURT: Would now be a good time to take a break?

MR. HEDLUND: Yes, your Honor.

May I inquire when we will be adjourning today?

THE COURT: 12:30.

MR. HEDLUND: I hope to make my examination short.

THE COURT: All right. Recess.

(There was a short recess after which the following further proceedings were had herein, to-wit:)

THE COURT: Are you ready to proceed?

MR. HEDLUND: Yes, sir.

THE COURT: You may.

BY MR. HEDLUND:

Q Mr. Davis, in your judgment, what is the future outlook for the utility market for coal?

A I would think the near term market for coal [701] would be excellent. There is quite a number of fossil fuel

plants going into service in the near future, so it would look to me that the production of coal would out of necessity increase in the near term.

Q What about the long term?

A I would think that the long term use of coal would be diminished. The air pollution regulations, I think, are going to play a very important part in the economics of using coal, and the disposal of ash, the disposal of sulphur, and that sort of thing.

However, the future for coal as a hydrocarbon through liquification or gasification, should be excellent.

Q How long have you known of the relationship between Freeman Coal Mining Corporation and the United Electric Coal Companies?

A I believe it was in 1960 that John Morris informed us that Freeman had a number of people on the board of directors of United and Frank Nugent was the Chairman of the Executive Committee. Since then, we have considered Freeman and United to be affiliated companies.

[702] Q Since 1960 up to the present time, could Freeman and United Electric, had they been independent, compete with each other for the coal business of CILCO?

A No. Prior to 1968 United provided all of our coal in the Peoria area. Freeman provided the coal for our Springfield plant. Since 1966, we have talked to United about their reserves in Peoria-Fulton County area. We had noticed that the reserves appeared to be diminishing, and at that time United mentioned the reserves of Freeman in the Springfield area. In 1968 we consummated a contract with United in which the reserves of Freeman were used to back up the term of the contract, possibly two years. The term of the contract was twenty years. They said that they thought that they had the coal reserves in the Peoria-Fulton County area for at least 18 years, possibly the full term. So Freeman was used to back up those reserves at the same cost per million BTU in the Peoria area.

So, if in the last two years coal has to be shipped from Springfield freight rate district, we will receive the coal in Peoria at the same current rate.

Q Up to, say, 1967 or prior to the present time were producers in the Springfield freight rate district [703] able to compete for the business of your Peoria area plants with producers in the Fulton-Peoria freight rate district?

A Historically we have used the Peoria-Fulton County freight rate district as a transportation base. All of our attempts to look at other areas for the most part included additional transportation costs.

Q I ask again were producers in the Springfield freight rate district able to compete for your business?

A No, sir, they were not.

Q What effect has there been, if any, on CILCO arising out of the common ownership and control of United Electric and Freeman, if you know?

A Well, considering our long-term contract with United, I would say the effect has been beneficial. We sought contracts from the coal producers in our area and the United contract was the only one that was forthcoming. We did have an approach by Humble to provide us coal but this was so scanty with information that when United offered us this contract, we accepted the contract.

Q Can you conceive of any potential benefit to CILCO that might follow from the divestiture of [704] General Dynamics' ownership of United Electric?

A Considering the location of our plants and the location of United Electric and the location of Freeman, I can't conceive of any possible benefit to CILCO from United and Freeman being required to divest.

[705] Q Has Central Illinois Light Company been engaged in merger discussions with other utilities?

A Yes, we have been. We have been engaged in merger discussions with the Commonwealth Edison Company and the Illinois Power Company. These discussions were terminated because the offers in the opinion of CILCO and our consultants did not adequately compensate our shareholders.

Q During those negotiations did either Commonwealth Edison or Illinois Power make reference to any

fuel cost advantage that might follow should the merger negotiations have been successfully concluded?

A Yes. In particular the Edison company talked about the future of nuclear energy. The Illinois Power Company, having lower fuel costs in Southern Illinois, thought perhaps they would have an advantage.

MR. HEDLUND: That is all I have. You may inquire.

THE COURT: You may cross examine.

CROSS EXAMINATION

BY MR. SIMS:

Q Mr. Davis, when was your Edwards Plant constructed?

A Our Edwards Plant was first constructed in [706] 1960. The initial unit went into service in 1960.

Q What was the installed generating capacity of that unit?

A 125 megawatts.

Q How many boilers were associated with this particular unit?

A One boiler.

Q What fuel has that boiler consumed?

A Coal.

Q Would you consider switching that boiler to gas or oil?

A Well, under present conditions we would not consider it. However, the future air pollution control regulations might force us to consider it.

Q If it was a matter of a price, the lowest price fuel, would you consider switching to gas?

A No, sir.

Q You distribute, CILCO distributes, gas, is that not true?

A Yes.

Q What is your lowest firm rate price for gas?

A Well, we have an interruptible rate of 36 cents per million BTU's.

Q That is an interruptible rate?

[707] A Yes, sir.

Q What is your lowest firm rate price for gas?

A Our lowest firm rate is about 45 cents. I had better go back and explain this. I am giving you the average costs to our customers for the year 1969. Now, the rate to an individual customer could be higher or lower than that, depending on their usage.

Q What is your average cost per BTU for coal at the present time?

A We purchase coal currently approximately 27 cents per million BTU's.

Q When was the next unit constructed at your Edwards Station?

A The next unit at the Edwards Station went into service in 1968.

Q You stated on direct, I think, that this unit consumed coal?

A Yes, sir.

Q Would you consider switching this unit to gas or oil?

A Just under the same basis that I stated previously.

* * * *

[712] Q And you burn gas at the interruptible rate?

A That is correct.

Q At this unit?

A That is correct.

Q Is it necessary for you to burn this unit when interruptible gas is not available?

A When interruptible gas is not available, for the most part we attempt not to run it or we burn coal on it.

Q Coal being more economical than the firm rate gas?

A That doesn't have any particular bearing on it. We are trying to fight the air pollution problem. We have mechanical-type precipitators. Due to the public pressure we attempt to burn gas.

Q So when you burn gas in this unit, you are not choosing a fuel from an economical standpoint. You are choosing a fuel, as you say, because of air pollution concerns.

A That's correct.

Q When did you construct the next unit at the Wallace Station?

A The next unit went into service in the latter part of the 1930's.

[713] Q How many boilers are associated with this unit?

A That is one boiler and one turbine on a common header again.

Q What is the installed capacity of this unit?

A That unit, I believe, is a 35 megawatt unit.

Q What fuels have you used initially?

A We used the same fuels on this boiler as we did on the previous boiler—coal initially, and then, when we got into the air pollution considerations, we switched to gas as an auxilliary fuel.

Q When was the next unit constructed at the Wallace Station?

A The next unit went into service in 1948.

Q How many boilers are associated with this unit?

A There were two boilers associated with that unit. That particular turbine had a 45 megawatt capacity with two boilers.

Q What was the fuel history of this boiler?

A We have burned coal on that particular unit, those two boilers, since they went into commercial operation. On this particular unit, we have electrostatic precipitators, so we don't have quite the air pollution problem we had on the previous boiler.

Q Even installing electrostatic precipitators [714] did not make the use of gas more economical than burning coal? Let me rephrase it.

You do not have to put an electrostatic precipitator on a unit burning gas, is that correct?

A That is correct.

Q The fact that you had to install electrostatic precipitators on this unit did not make the gas more economical than coal, did it?

A That's correct.

Q When was the next unit in at the Wallace Station constructed?

A The next unit went into service approximately 1952.

Q What was the installed capacity of this unit?

A This unit was a 72 megawatt unit with one boiler.

* * * *

[718] Q Mr. Davis, I would like to read to you a paragraph or two from your 1969 Annual Report as a preliminary question.

THE COURT: Is there an exhibit number, Mr. Sims?

MR. SIMS: No, sir, there is not.

THE COURT: All right. Do you intend to have it identified, in that you are reading from it?

MR. SIMS: No, I was simply going to read it and ask him if that was, in fact, true.

THE COURT: All right.

BY MR. SIMS:

Q (Reading) "Mounting evidence indicates that the natural gas industry is not finding sufficient new reserves to keep pace with the rapidly increasing demands. Many pipeline companies are now finding it difficult, if not impossible, to develop new gas supply expansion programs. Though the exact cost of this dilemma is not readily ascertainable, there is increasing contention by some authorities in industry and government that wellhead prices in recent years have been too low and, consequently, have resulted in the present unsatisfactory level of exploration, [719] development and production."

Is it not true, Mr. Davis, that because of this concern about the supply of natural gas that CILCO is expanding its underground storage facilities at the present time?

A Yes, we are expanding our underground storage facilities.

Q Is it not also true, Mr. Davis, that you are having trouble simply supplying the firm rate customers with natural gas?

A No, sir. We had more than sufficient gas supplies during this past year to serve our firm rate customers. We are expanding our gas storage field to assure ourselves next year that we will have the same capability. At the same time we have a requisition or a request in the Panhandle to further assure this.

Q Mr. Davis, do you expect gas prices, either inter-

ruptible or firm, to approach the price of coal in the near future?

A To approach the price of coal? No, I wouldn't think that.

Q What price per million BTU do you pay for oil?

A We purchase oil as an ignition fuel. It's [720] a refined oil and we pay about approximately 70 cents per million BTU.

Q Is it not true, Mr. Davis, that the price of coal has been significantly lower than gas or oil for the last ten years at least?

A Oh, yes.

Q You made studies, or CILCO made studies, did they not, concerning CILCO's average cost in connection with a proposed merger with Commonwealth Edison?

A I don't understand your question. The average cost of fuel?

Q Yes, at the CILCO system.

A We have kept track of the fuel cost trends of the electric utilities in Illinois for a number of years.

Q But, did you not make a specific study of the fuel cost of CILCO in connection with the Commonwealth Edison's proposal to merge?

A Oh, yes. We looked at our fuel cost.

* * * *

[724] BY MR. SIMS:

Q How much coal did you consume in 1964?

A We consumed just a little over a million tons.

Q How much did you consume in 1969?

A A million six hundred thousand tons.

Q Mr. Davis, do you think the State of Illinois will ever pass a law that in effect prohibited the burning of a substantial portion of Illinois coal, not only in the heavily populated areas, but in all sections of Illinois?

MR. HEDLUND: Your Honor, I am going to object. I think this is pure conjecture, and I do not believe Mr. Davis is a member of the state legislature. I will object on that basis.

MR. SIMS: Mr. Hedlund was asking him to predict what coal he would use in the future, and—

THE COURT: Well, we do not know what legislation will be passed. It is totally a matter of conjecture. Objection sustained.

BY MR. SIMS:

Q Mr. Davis, I think you stated on direct that the only other company interested in supplying CILCO at the time you were negotiating to supply your No. 3 unit besides UEC was Humble Oil Company, is this [725] correct?

A That's right.

Q Do you know approximately where the Humble coal reserves were located?

A Well, as I understand, the Humble coal reserves are located in the vicinity of Carlinsville, Illinois.

Q Do you know what county that is?

A No, I do not. It's right below Springfield, possibly —well, I don't know.

Q But, it is, as you say, somewhere below Springfield?

A Yes, sir—

Q The Freeman—excuse me.

A I am sure the vicinity of the coal around Carolinsville.

Q The Freeman Crown Mine is located in this general vicinity, is it not?

A That's correct.

Q Did Humble Oil indicate to you that they would supply you coal at a price competitive with Fulton County coal at the time you were negotiating for this No. 3 unit?

A Yes, they did.

[726] Q Now, I think you testified that in the future you expected probably to look to either Springfield or Southern Illinois for your future coal supplies?

A I don't believe I said that. I said that we would attempt to get the coal from the Peoria-Fulton County area or below Springfield.

Q If you go into the Springfield area to obtain coal, you will probably be dealing with either Freeman or Humble as a supplier in that area, is this not true?

A I presume.

Q Is it not true that when you were negotiating to supply your No. 3 unit at Edwards, you expressed an interest to the UEC officials in the Industry Field?

A No, that's not true.

Q You are familiar with the Industry Field of UEC, are you not?

A Yes, I am.

Q The Industry Field was not brought up in these discussions with UEC?

A We have never been approached by United Electric to furnish us coal from the Industry Field.

Q That was not my question.

Did you ever mention the Industry Field, in connection with supplying the No. 3 unit, to UEC officials?

[727] A At various times Industry Field was brought up in conversations, but no serious negotiation for the coal in the so-called Industry Field has ever taken place.

Q Assuming, Mr. Davis, that Industry Field is mined in the near future, is it not possible that UEC and Freeman would be competing for your coal requirements if they were operated as independent companies?

A If I care to make that assumption. I'm not real sure I can basically make the assumption.

Q I have asked you to make the assumption.

A Beg pardon?

Q I have asked you to make the assumption.

A I would have to assume, then, as long as we are assuming, from what I know of the Industry Field that the coal, from the various conversations that I have had, is not economically strippable. Now, if that's the case, then you would have to make the assumption that it's not economically available to you.

Q I asked you, though, assuming Industry Field was mined in the future—

A Yes.

Q (Continuing)—and this coal was offered to CILCO, is it not possible that UEC and Freeman would be [728] competing for the coal requirements of CILCO if they were operated as independent companies.

A Mr. Sims, it's awful hard for me to make that assumption all the way through.

Q Humble did offer to supply you coal in connection with this No. 3 unit, did they not?

A That's correct.

Q Humble reserves are very close to the Freeman reserves in Central Illinois, are they not?

A They're in Central Illinois, that's correct.

Q So, it is possible that Freeman will be supplying you coal in the future, is this not true?

A The term of our contract is for 20 years. It's possible for the latter two years that they would be furnishing us coal from the Freeman reserves.

Q You are planning to construct another coal unit in 1976, are you not?

A We are planning to construct another unit. We will have to study the fuel supply situation and make a determination after those studies. I can't say today is it going to be coal.

Q You have not committed yourself to purchasing any coal for this 1976 unit, have you?

A We have not made any commitment.

[729] Q So, are you in any position to say that if UEC and Freeman were merged, that they would have no effect on CILCO in the future?

A Well, we have studied the United Electric reserves, Mr. Sims, and we just can't see where United Electric has the reserves to be a factor in the coal business as far as we're concerned.

Q If their Industry Field was mined, however, they would be a factor in Fulton-Peoria area, would they not?

MR. HEDLUND: I am going to object, your Honor, at this point to further interrogation with respect to the Industry Field, unless Mr. Sims put all of the assumptions into such a hypothetical that are necessary for the witness to be able to answer the question. I believe he has been asked this question two or three times and the witness has said either that he did not know about all of the facts or it would depend, and so on. I am going to object to further questioning on this.

THE COURT: Do you have any comment, Mr. Sims? Hasn't this question been asked and answered?

MR. SIMS: Yes, I think so.

THE COURT: All right. The objection is sustained.

[730] BY MR. SIMS:

Q Is it your opinion, Mr. Davis, that UEC cannot sell its present coal profitably without Freeman back-up reserves?

A Well, in our own case we would not have purchased coal from United for a term less than 20 years. We were looking for a million tons of coal per year for a term of 20 years, and if they did not have this coal, there would have been no contract, I feel sure of that. I negotiated with United for a long period of time. We were after this coal for about a year, talked to Truax-Traer, Peabody, Humble, United, and we were looking for this coal for about a year trying to get a million tons a year.

So, I feel certain, had not somebody come up with the coal and the reserves that we wanted, we would have tried to put something else together. Now, what that would have been, I don't know, but it would have put them in a rather precarious situation as far as we were concerned.

Q My question was, Mr. Davis, do you have any doubt that UEC would be able to profitably sell its coal reserves?

A Yes, I have serious doubts. As a matter of [731] fact, we have a contract, or did have a contract running through 1974 with United, in which reserves of Cuba were sold to us, but due to the lack of discovery, let's say, the reserves weren't there, so we had serious doubts about United's ability to produce coal to us.

Q Did you revoke this particular contract with UEC?

A It is being revoked from the Cuba Mine simply because the coal reserves at Cuba are running out this year, while we had a contract going through 1974. This was the additional pressure, so to speak, to give us a good contract with good reserves from United. So, United's reserve situation, I think, is very lean to say the least.

Q Do you know for a fact, Mr. Davis, that the Cuba reserves are running out this year?

A From the best information I can get from their drillings and what they tell us, they have not found the reserves in that area that they expected to find. Otherwise, they've run into faults where the glaciers have come down and pushed the coal out or ground it up, so consequently they simply just don't have the coal. This is one of the things that you [732] run into sometimes.

Q Before you entered into the present contract with UEC, the original contract with UEC was to expire when, 1974?

A As I recall it.

Q Is your statement now that CILCO would have revoked this contract had they not entered into another contract with UEC?

A I don't know that we would have had any other choice. We have to have coal, so we got to working with United and Freeman to provide us the coal from another source.

Q UEC indicated then that they would not commit any coal other than the Cuba coal reserves?

A Oh, no. They're committing the Buckheart reserves to us now.

Q This is under the present contract, right?

A No, sir, this is under the future contract?

Q Excuse me.

This is the one that starts in 1978.

A It starts when the Buckheart reserves run out, unless assume they run out this year, then the future contract would start at the Buckheart arrangement.

Q It is a fact, though, is it not, Mr. Davis, [733] that there was very little enthusiasm among the coal companies to supply your No. 3 unit on this 20-year contract?

A Well, it's a fact that Peabody, for instance, had just built a new mine at Alma, and they were not getting the production out of the tipple that they had expected because they were running into technical difficulties, washing the coal and that sort of thing. We have a long-term contract with Pitt-Midway, and they are running about full production. Truax-Traer, we just consummated a contract with them two years prior. So, we

had just about used up the tipple capacity or the production capacity then available from that field.

[734] Q Consolidated Coal would not even talk to you concerning this particular arrangement, is that true?

A If you're speaking of Truax-Traer, yes. Well, they talked to us.

Q Pittsburgh Midway and Republic told you they had insufficient reserves?

A That's correct, in that area.

THE COURT: Excuse me, Mr. Sims. How much longer will your cross examination be?

MR. SIMS: Probably 20 minutes.

MR. CUSACK: Your Honor, may I confer with my co-counsel for a moment?

THE COURT: Yes, you certainly may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Thank you, your Honor.

MR. SIMS: It will probably be 25, 30 minutes.

THE COURT: Well, I regret that the only thing we can do is to proceed until 12:30 and we will have to recess. Will this witness be available Monday morning?

MR. HEDLUND: Is there any possibility, your Honor, of trying to get another half hour in this afternoon?

[735] THE COURT: I cannot. I just cannot work it in. We started at 9:00 this morning.

MR. HEDLUND: I know. I will have to consult with Mr. Davis.

THE COURT: Will you confer among the parties here and try to work it out. Let me inquire at this time as to how much longer the defense is going to take.

Is it Tuesday that I have the three-judge court?

THE CLERK: Yes, your Honor, 2:00 o'clock.

THE COURT: We will go from 2:00 to 3:00 on that, and we will start the trial at 3:00 on Tuesday afternoon.

MR. HEDLUND: Your Honor, I will have to take a look at our trial list. I am concerned that I think at this

point we are about two days late in terms of our original schedule.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: For example, our original schedule was to have completed this week all of the witnesses that have been on the stand plus four that we did not put on or three we did not put on and two now that have not had their cross examination completed. I would say at [736] this time, your Honor, that unless it shortens up very, very quickly next week, we would be into the week of April 13th on our case. We are, of course, willing, with the Court's pleasure, to extend the time of the trial days. Actually, it is more in our benefit because most of these people are from out of town.

THE COURT: I will have to work a schedule out. That is the reason I wanted to ascertain it, because it is going beyond the estimated period of time in which I hoped to finish.

Will this witness be available on Monday, or are you going to discuss it with him?

MR. HEDLUND: I will have to discuss it with him, your Honor.

MR. CUSACK: Will Mr. Thorson be called Monday?

MR. HEDLUND: Mr. Cusack, I do not know how I can answer this unless we sort these other things out. On Monday we have a witness whom I have promised up and down would be on Monday, and that is Mr. Ernest Tremmel of the Atomic Energy Commission, Chairman of their Industrial Division. He is coming in with AEC counsel Sunday night, so I have to put Mr. Tremmel on one way or another Monday. I will have to talk to Mr. Davis [737] about his availability next week.

MR. CUSACK: We would like to know as soon as possible who you would like to call on Monday.

MR. HEDLUND: Mr. Cusack, you will know within moments after we reach a decision.

THE COURT: Let me make this suggestion: will both sides try to shorten their interrogation. I do not

like to keep harping on this, but there are repetitious questions by the plaintiff here, and one question could cover five as they are being asked. Now, you are all able lawyers, and it is dragging on and on with repetition and going back and forth. I know you can do it, Mr. Cusack. I do not want to circumscribe your examination, but we are taking what I would say is 50 percent more time than should be taken with carefully prepared cross examination. I wish you would keep that in mind.

MR. CUSACK: Yes, your Honor. I will review the cross examination of my colleagues.

THE COURT: All right, then, we will recess until Monday morning at 10:00 o'clock. Thank you. Check it out amongst you on this.

MR. HEDLUND: Very good.

MR. CUSACK: Thank you, your Honor.

[738] THE COURT: Good night, and have a good week-end.

(The hearing in the above-entitled cause was adjourned to Monday, April 6, 1970, at 10:00 o'clock a.m.)

[739]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,
Monday, April 6, 1970
10:35 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM.

* * * *

[741] A. H. DAVIS,

called as a witness by the defendants, having been previously duly sworn, was examined and testified further as follows:

CROSS EXAMINATION

(continued)

BY MR. SIMS:

* * * *

[744] Q In other words, it is of benefit to you to have two coal suppliers in such a case as that so you [745] can

remind the other coal supplier that if he doesn't reduce his price, you will start buying the coal from the other?

A Well, as you know, Mr. Sims, we have had and still do have a number of suppliers, so we attempt to use whatever leverage we can to get the prices we can.

[746] Q Do you expect the price of coal to go up in the future?

A If we continue the inflation that we have had during the past several years, I certainly would expect that commodity as well as all commodities to go up in price.

Q Then is it your belief that coal companies will not respond adequately with sufficient supplies of coal to keep the prices stable in the future?

A I have no real belief in that area one way or the other.

Q Do you have any opinion as to whether coal companies will be able to improve mining technology and reduce the cost in the future?

A I would certainly hope so. I am not an expert in that field. I really don't know if they had planned or what their future might bring about.

Q Are you confident that if they should improve cost, they will pass these cost benefits on to you?

A Our contracts in general are based somewhat upon their production costs, so if they should increase their productivity, that will reflect back to us.

* * * *

[748] Q In the last five years it has gone up?

A When we have seen the inflationary trend, the cost per million BTU's has gone up.

Q Assume for a minute this unit you are planning to bring into service in 1976 will be a coal burning unit and will consume approximately one million tons of coal per year for its expected life of, let us say, 20 years.

Now assume Coal Company A offers to supply the total fuel requirement of this unit. That is, one million tons per year each year for 20 years.

Assume Coal Companies B and C are to supply you 500,000 tons each per year for 20 years and Coal Companies B and C offer their coal at a lower price than Company A.

Which company or companies would you award the contract to?

A Well, there is a number of factors to be considered there. In general, if you have one supplier that would supply you one million tons a year and you could unitize the shipments, and if you had the facilities to receive this unitized shipment, then in all probability the transportation costs would be less, so we would have to add up the cost the fuel at the mine, plus the [749] transportation cost, and based upon that I don't know which one would be the lowest.

Q My assumption was that the coal being supplied from Companies B and C, total delivered price, was cheaper than Company A. Which company or companies would you award the contract to in that situation?

A Well, let me frame my answer like this: Knowing the problems of the supply of coal, I doubt very much if we could get such a situation as you are speaking of. But if we could, I guess it would make no difference. You would take the lower cost.

Q You would award to Companies B and C?

A Right

[750] Q Take the same situation. Company A will supply you one million tons per year for 20 years. Assume Companies D, E, F and G come to you and each offers to supply you 250,000 tons each per year for 20 years. Companies D, E, F, and G offered you a lower price for delivered BTU of coal than Company A.

Which company or companies would you award the contract in that situation?

A Are we also assuming, Mr. Sims, that each one of these companies has the proper reserves?

Q Certainly.

A And did you say the cost per million BTU's amongst all of them was the same?

Q No. Companies D, E, F, and G yes: their delivered coal price was lower than the delivered price of Company A.

A The transportation costs are the same?

Q The total delivered cost was lower for Companies D, E, F and G.

A I presume that if we had one supplier that could supply all the coal and several suppliers that could supply some fraction of the coal, it would make no difference except in the bookkeeping that we were concerned with. We would much rather deal with one [751] supplier or say three suppliers rather than ten suppliers.

Q Would you much rather deal with one supplier than four suppliers, if the cost was cheaper with the four suppliers?

A Well, let me give you an indication of what we run into. If we have four suppliers of coal, which we do substantially now, and one of them runs into tipple trouble, which one of them has, then we have a problem with supply from that particular guy. From that producer, that is.

Now, I suppose that if you had ten suppliers, your possibility of running into transportation problems—let's take the cars. As you probably know, the cars available to the coal people are in very short supply. So, the more coal you ship out that is handled by one railroad, it gives you a much better possibility of receiving coal.

During this past year in the fall when the grain shipments were high, if we had had ten suppliers of coal, in all probability we couldn't have got any coal cars. So just from a practical standpoint, you are better off with one or two or three or four suppliers than with ten suppliers.

Q If you are being supplied from ten different [752] mines, and something goes wrong in the tipple of one mine, you usually can turn to the other nine to make up the balance of the production, can you not?

A I wish that were the case. It is not the case. The fact is that all of the producers are producing at their peak, and if we wished to pick up coal, we almost have to go out begging.

[753] Q Would you rather be faced with the situation in which one of ten suppliers could not supply you with coal or whether your only supplier could not supply you with coal?

A Well, I guess we're getting down to a problem of probability here, reliability. If we take them as being all adequately tooled up and everything, I suppose that if you had 100 suppliers, you'd be better off, and they were all going to deliver.

Q The present coal companies operating in the Fulton-Peoria area are Ayrshire, UEC, Truax-Traer, Peabody, and Pittsburgh-Midway, is this correct?

A Ayrshire or Republic is a little more remote from us than Peabody, Truax-Traer, and United. We pay a higher or would pay a higher, freight rate from Republic than we would from the other three.

Q Do you know if you would a higher price, total delivered price from Republic?

A Very definitely.

Q Have you received price quotations from them?

A Yes, we have.

Q Would you be concerned, Mr. Davis, as president of CILCO, of UEC and Freeman merged with Truax-Traer?

A As your Department undoubtedly knows, we made [754] a complaint several years ago about the merger of two coal companies in our area, and you have a reached a satisfactory settlement, I take it, with those two companies, so anything that we feel reduces the amount of competition in our area, we are certainly not that bashful about making a complaint. If Truax-Traer were to merge with, say, Peabody in our area, we'd make another complaint.

Q Why would that bother you, Mr. Davis?

A It's a reduction of competition in our area.

Q One less supplier—

A That's right.

Q (Continuing.)—supplying you with coal?

A That's right.

Q Then, do you feel it is a benefit from a competitive standpoint to have several independent companies in competition to supply you with coal?

A Oh, yes.

Q You said yes?

A Yes.

MR. CUSACK: Your Honor, may I speak to Mr. Sims for just a moment?

THE COURT: All right. You may.

(There was a short interruption, [755] after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Thank you, your Honor.
THE COURT: All right.

[756] BY MR. SIMS:

Q You testified that you first became aware of the Freeman-UEC association, I think, in about 1960?
A That's correct.
Q You are not in the position, are you, to tell what would have happened if UEC had been a competitior and were not associated with Freeman as of 1960?
MR. HEDLUND: May I have that question back, please?
THE COURT: Read the question.

(The question was read by the reporter.)

MR. HEDLUND: I am going to object to that question. I think it has an assumption that UEC is not a competitor. Do you mean with Freeman, Mr. Sims? The question isn't clear to me, your Honor. I object on that basis.

BY MR. SIMS:

Q That it was operated independently of Freeman.
MR. HEDLUND: I am still going to object. I think the question is hopelessly garbled at this point and cannot be understood.
THE COURT: Reframe the question.

BY MR. SIMS:

Q Mr. Davis, are you in a position to say what competition UEC would have offered Freeman or Freeman offered UEC had they not been affiliated as of 1960?
[757] A I will offer an opinion, Mr. Sims. As far as we are concerned, and we, I think, have so stated to your department, that the competition between Freeman and United did not affect us, one prime reason being that United had limited reserves. As far as we could see, the reserves back-up that was going to be provided by Freeman would be beneficial to the purchasers of coal, so we just don't believe that the affiliation between the two companies did anything to eliminate competition, specifically as far as we are concerned.

Q Do you know for a fact, Mr. Davis, that Freeman would not have offered you coal from their Crown mine but for the association with UEC?

A To the best of my knowledge, Mr. Sims, we have never had a Freeman salesman call on us, as far as I can say, forever.

Q But, do you know if one would have called on you after 1960, had they not been affiliated with UEC?

A I really couldn't say whether they would have or wouldn't have.

Q You supervised the preparation of the subpoena questionnaire sent to CILCO in connection with this case?

A Yes, sir.

[758] Q The questionnaire asked for, among other things, the price, including transportation costs, that CILCO paid for coal from each mine of its suppliers where the shipments were 20,000 tons or greater, is this true?

A Yes, sir.

Q Did you notice, when completing these questionnaires, that in 1967 you were paying identical prices to the penny, $4.68 a ton, for coal from Peabody's Fairview mine, Truax-Traer's Fiatt mine and UEC's Cuba mine to your Edwards station?

A Yes, sir.

Q You were aware of that?

A Yes.

Q I also notice that you were paying the identical price to the penny, $4.93 a ton, for coal from Truax-Traer's Fiatt mine, Pittsburgh-Midway's Allendale mine, and Peabody's Fairview mine to your Wallace station. Were you aware of this?

A Yes.

Q Does it concern you that for two of your largest generating stations you were receiving identical prices from several of your coal suppliers in 1967?

A No, it doesn't concern me, Mr. Sims. As I [759] mentioned earlier, what we try to do is we try to obtain the lowest cost per million BTU's from one or several of our suppliers, and then we try to use that leverage on the other suppliers to obtain substantially the same price.

[760] Q I see.

A (Continuing.) Now, today, due to different escalations, we are not paying that same price to our suppliers.

Q But, I noticed in the 1966 questionnaire, Mr. Davis, that you were not paying identical prices, you were not receiving identical prices, from these same suppliers. Is it your belief, then, that it was simply a coincidence that the prices happened to be the same for 1967?

A I really couldn't say. I'd have to review it. In 1966 we negotiated a new contract with Truax-Traer which substantially reduced the cost of coal to us. Today the cost per ton, they are about the best buy. The cost per million BTU's, the best supplier is United.

You see, substantially when we talk about cost per million BTU's, we are talking about one thing. We are talking about quality. When we are talking about the cost per ton, we're talking about a lower price, and really, we go by the cost per million BTU's.

Q I see.

I notice in the questionnaire that you had listed on the questionnaire that they had all identical BTU contents, and yet the price was identical, so [761] apparently they were selling you the coal at identical price per million BTU?

A I don't recall what the question on the questionnaire was. Was it BTU's specified?

Q Yes. They did specify what BTU's you received.

A Yes. No. Was the question—on the questionnaire, was it BTU's specified?

Q No. It was the BTU's in the coal delivered to you from the companies.

A All right.

Q They were identical BTU's?

A I expect the answer there was our average BTU received. I don't know.

Q But, at any rate, you did not bring it to the attention of the president of the Antitrust Division, the price that you were receiving, identical prices from these coal producers in 1967?

A I see no reason why we should.

Q Would you take the contract from the first coal producer and would you go to the next one and say, "This is what I received on this contract, and you could give me

the coal at the same price"? Is that the way you handle it?

A Normally the coal has been pretty much the [762] same cost per ton. The varying factor has usually been the transportation cost. Now, these tariffs are pretty well published, so we simply point out to the suppliers that we can obtain transportation cost from such and such a mine at whatever cost it is.

[763] Q How do the coal companies determine what the mine cost of the other coal companies is?

A I haven't the slightest idea.

MR. HEDLUND: I am going to object to that. I do not believe this witness is qualified to say how coal companies find out about other coal companies' costs.

THE COURT: If the witness knows, he may answer.

BY THE WITNESS:

A I haven't the slightest idea.

BY MR. SIMS:

Q Did you analyze the coal from Freeman's Crown mine to see if it would burn in your boilers properly before entering into the contract with UEC in 1968?

A We did not.

Q You would assume it would burn properly?

A We made that assumption, yes.

Q I see.

Was there any reason for you to believe that it will not burn properly in the same boilers which you burned the UEC coal in?

A From what they told us of the coal, we assumed that it would burn properly.

MR. SIMS: I have no further questions at this time.

[764] THE COURT: Is there any redirect?

MR. HEDLUND: Yes, your Honor.

REDIRECT EXAMINATION

BY MR. HEDLUND:

Q Mr. Davis, is it likely that the transportation costs involved in a shipment of a million tons from a single sup-

plier would be less than 500,000 tons each from two suppliers, or 250,000 tons each from four suppliers?

A Well, in our negotiations with our railroads, for the most part the railroads would very definitely like to have shipments in the neighborhood of a million tons. We have one railroad that won't even consider shipments less than a unitized train. So, if you ask this particular railroad to haul a shipment of 250,000 tons, they wouldn't even consider it. So, very definitely the transportation cost is based upon unitized haul and tonnage, volume shipments.

[765] Q Is CILCO still out trying to obtain new gas customers?

A Yes. We are trying to obtain new gas customers. We have a very definite effort going on to sell our gas supplies.

Q In the discussions with Humble Oil in terms of trying to or being interested in supplying your stations in Peoria, were they able to present sufficient information for you to know whether, had you gotten a bid from them, their price would have been competitive with Fulton County coal?

A Humble Oil at the time they approached us had just decided to open up a mine and get into the mining business. While they quoted us a price or suggested a price they thought they could deliver the coal to us at, they had no specific information and had not made a firm offer as such, had not presented a contract as such, had not indicated what the transportation to us would be as such. They were very scanty in their information. As a matter of fact, I think looking at the mine safety laws that have been passed since they made their initial approach, we would expect their cost per ton of coal to have increased perhaps 60 or more cents per ton, which would have undoubtedly created an escalation that would [766] have put them out of order.

Q One final question, Mr. Davis. Can you give me some sort of feel of the average length of haul by railroad or any other means of transportation you have with respect to coal shipment to your Peoria area stations?

A The length of haul to our Peoria area stations varies from 30 to 45 miles by railroad.

MR. HEDLUND: That is all I have, your Honor.
THE COURT: Any recross?
MR. SIMS: Yes, your Honor. One question.

RECROSS EXAMINATION

BY MR. SIMS:

Q You mentioned the mine safety laws, Mr. Davis. Should this make strip coal more attractive now with the increased cost of deep mines?

A Strip coal is affected to a lesser extent than deep mine coal. I don't know exactly what this extent will be, but to a lesser extent.

• • • •

[770] ERNEST B. TREMMEL,

called as a witness by and on behalf of the Defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name and occupation.

A My name is Ernest B. Tremmel. I am employed by the U.S. Atomic Energy Commission. My title is Director, Division of Industrial Participation.

Q Now would you please describe your duties and responsibilities as Director of the Division of Industrial Participation?

A In about 1961 the U.S. Atomic Energy Commission decided to establish a Division of Industrial Participation because under the Atomic Energy Act the Commission is charged not only with developing nuclear energy, for weapons for the security of our country, but also to develop the peaceful uses of nuclear energy that might benefit our way of life.

Along with developing the peaceful uses, the Act itself said we should develop a competitive industry.

So in 1961 the Commission established [771] this division, whose purpose was really about three-fold.

First was to be a focal point for American industry, so that in the Atomic Energy Commission American industry would have one place to come to learn about what the opportunities were for the peaceful uses of nuclear energy.

The second function was to review the research on the work done in our laboratories throughout the nation, in government-operated laboratories, to determine what activities had reached a point of technology where they might be applied to commercial utilization by our system in our country.

[772] The third function was to report to the Commission at least annually on how successful the Commission was in carrying out its responsibility of developing peaceful uses of nuclear energy. This is done by means of a report that our Division puts out, and through the annual report of the Atomic Energy Commission.

We had a fourth function later assigned to us, and that's to be a point of contact for the states, strictly from, primarily from trying to attract new industry to the states. We were the place where the states representatives could come to and say what kind of industry in the nuclear field seems to make sense in our state.

Then we had a fifth more minor function added that is to look at spin-off typical of the NASA spin-off program, to look at things in our laboratory, techniques or machine tools or applications that were non-nuclear that might have use in private industry.

BY MR. HEDLUND:

Q Could you now briefly give us a description of the highlights of your career or your background?

A Yes. I graduated from the University of Wisconsin in Madison, Wisconsin, in 1941. I spent about [773] a year working in the aircraft industry and then joined the U.S. Corps of Engineers, where I worked on the construction of a small arms plant for about two years. In about 1943 I joined a secret project called the Manhattan Engineering District, at which time I did

not know myself what they were doing, but we knew it had something to do with the war effort, and I spent about eight years from 1943 to about 1950 working on the atomic bomb program.

In 1950 I transferred to our Chicago operations office, which manages the Argonne National Lab, and transferred to our programs for peaceful uses of nuclear energy. From 1950 until 1960 I spent my time, about three years, at Argonne National Lab on basic development of nuclear energy, and I spent about five years on work related to the development of a nuclear propelled aircraft, and then around 1958 or '59 I transferred to our headquarters to work as an assistant to Commissioner Floberg and then Commissioner Wilson, and then—

Q These were Commissioners of the Atomic Energy Commission?

A These were Commissioners of the Atomic Energy Commission. I spent about three years working [774] as an assistant to the Commissioners.

In 1961 when the Division of Industrial Participation was established, the Commission named me as the Director of that Division, which position I am presently holding.

Q Thank you.

When was the Atomic Energy Commission created?

A The Atomic Energy Act was first passed in 1946, and that set up a civilian agency to handle the nuclear energy program.

Q Are you familiar with the activities of the AEC and of American industries since World War II in developing nuclear energy as a source for the generation of electricity.

A Yes, I have been directly or indirectly connected with these programs, so I feel I am very familiar with all of these programs.

Q Would you then, please, briefly relate the history of that development first through the year 1964?

A Well, as early as 1946 when the Atomic Energy Act was passed, a number of chemical companies in the United States began some studies to take a look at the application of nuclear energy to central station power.

[775] Q By "central station power" you mean an electric utility?

A Electric utility industry.

From about 1946 to around 1950 or '51, there were a number of these studies carried out, and around 1950, in that time period, the AEC itself undertook what we called an experimental reactor program, and under that program we built an experimental boiling water reactor at Argonne National Laboratory, and in connection with the Navy program, Admiral Rickover's program, a pressurized water reactor was built at shipping port. The reason why I mention these two is because the light water reactors that are being sold today are either based on boiling water or pressurized water technology, so that the experimental boiling water reactor at Argonne was an experiment to demonstrate that you could satisfactorily make such a machine work, and the Shipping Port project was an experimental reactor to show you could generate power from pressurized water.

Now, following that the Commission then went forth with what we called a power demonstration series of rounds. We had three different times when we went out for public invitations to encourage private industry [776] to carry this technology from these experimental reactors into practical use. As a result of these demonstrations, there were two large reactors built. One was the Dresden No. 1 outside of Chicago,—

Q By whom was that—

A (Continuing.) —the Yankee Atomic Power Plant up in New England. The Dresden No. 1 was a boiling water reactor, and the Yankee Atomic Power Plant was a pressurized water reactor.

Q I am sorry to interrupt you. I just wanted to ask you who actually built Dresden No. 1, what utility?

A Dresden No. 1 was built—I would like to explain this in a little more detail, that under this invitation under the first round, it called for a cooperative effort between a utility, a private manufacturer, and the United States Government through the Atomic Enery Commission, and the concept was that one would build the plant which would be built actually on a utility

system, so that you could demonstrate the generation of power from a nuclear plant and its use, but that it would not, necessarily, be economical. In other words, the power might cost more than if you had put a fossil plant, but the extra cost was picked [777] up by all three participants, the utility, the Atomic Energy Commission, and the manufacturer, in order to demonstrate the practicalness off utilizing nuclear power on the utility system.

The one at Dresden was a combination of General Electric, Commonwealth Edison and the Atomic Energy Commission. The Yankee Plant was a combination of a group of New England utilities, Westinghouse, and the Atomic Energy Commission.

I wanted to also mention that under these invitations we had three rounds. The first round was directed more at the large utilities in our country. The second round was directed at the smaller utilities, the municipals and the REA, to give them a chance to get some knowhow in this new field, and the third round was pretty much general again.

Following the Yankee and Dresden Plants, both General Electric and Westinghouse next offered commercial plants on a strictly unsubsidized, economical basis.

There is one other interesting point there, that in both of these cases General Electric and Westinghouse offered plants at a date somewhat before they had gained a lot of experience in actually operating [778] Dresden or Yankee, but these two initial plants led the road for these two companies to move into the commercial field. [779] Q Could you mention some of the stations that were built in what you have referred to as the second round of the program?

A Yes. The second round was directed at small plants, such as Elk River, the Pathfinder, and Dairyland, and the Piqua plant.

Not to take up a lot of time, but there were other concepts of reactors that were cooled with other coolants than light water. The Piqua plant, for example, was a small plant which was built to see if an organic cooling material might make more sense.

The Pathfinder plant was built to demonstrate a different purpose, to demonstrate how one might generate steam and whether you could have superheat. There were two plants built, Puerto Rico and Pathfinder, to see whether superheat might make sense in a nuclear reactor.

Q Who was the utility involved in the Pathfinder?

A That was Northern States Power Company.

Q And you mentioned Dairyland—

A Dairyland Power, in my hometown, LaCrosse, Wisconsin.

I might say, so that the record is clear, [780] that the Commission had responsibility to develop competition, as this nuclear industry was developed. So we feel we were rather unique in that here is a technology that was born as a Government monopoly, and we had a goal to transfer this technology into the private sector of our economy and create a competitive industry.

So in addition to GE and Westinghouse, Allis-Chalmers was the original company that went into this cooperative program on the Dairyland, and I believe the Pathfinder also was Allis-Chalmers.

We also had been and were building a cooperative program at Consolidated Edison in New York called the Indian Point. So we brought a number of companies—B&W, General Electric, Westinghouse, and Allis-Chalmers—into the field at an early date in order to get and to give a number of companies experience, equal experience, so they could enter the field.

[781] Q "B & W" is Babcock & Wilcox?

A Yes.

Q Could you tell us, please, of the significant changes which have occurred in the position of nuclear energy as a source of generation of electricity since 1964?

A Well, actually the first nuclear power plant that was considered to have been sold strictly on an economical basis—in other words, that it could compete with fossil fuel plants and was purchased by the utility because it was the cheapest source of power—was the Oyster Creek Plant. That was contracted for in 1963.

From 1963 until the middle or end of 1965 there were no more nuclear power plants contracted for. In fact,

the President at that time had asked Dr. Seaborg, who was Chairman of the Atomic Energy Commission, whether we were ever going to really make these plants competitive, as were were putting a lot of money into developing nuclear power.

Around the latter part of 1965 what we called a surge to nuclear power occurred. Around the last part of 1965 the ultilities purchased seven nuclear power plants totalling over 4,000 megawatts.

[782] Then in 1966 they purchased 20. In 1967 they purchased 31.

Q These are thousand megawatts?

A These are number of plants.

To put this in better perspective, both in 1966 and 1967 the amount of nuclear capacity or generating capacity purchased was about 50 percent of the total. In other words, the other 50 percent was fossil-supplied power of one sort or another.

So to show what happened here, even in the Atomic Energy Commission there was none of us, nobody in the industry, that would have dared be this optimistic as to say that nuclear power would come into practical use—not practical use, but would be ordered this rapidly. So of course in the Commission we were surprised and happy to see that it was finding this commercial application.

Now, in 1968 the orders fell off to about, I believe, 15. Last year, 1969, there were either 7 or 9 plants purchased, depending upon what year you want to put 2 plants that were purchased at the end of the year—some people throw it into orders for 1969; others have put it into orders for 1970.

So the total amount of nuclear power [783] ordered to date, and these are firm orders, is about 130 plants or around 75,000 to 80,000 megawatts.

[784] Q Has the Commission prepared a compilation of the nuclear plants that are under construction, that have been ordered or that are likely to be announced?

A Yes. We prepared two reports. One is an official AEC press release, which comes out about quarterly,

which lists the plants and their locations and also breaks them down by what states the plants are in.

Then my particular division prepares a report in which we list plants on order, in operation or under construction, and we prepare that, but not necessarily quarterly. We change it whenever we feel there has been any significant changes.

Q I show you what has been received in evidence as Defendants' Exhibit 107, and I ask you if this is the first compilation to which you have referred?

A No. This is the second. That is the second one to which I referred in my statement.

Q I am sorry. This is the one that is prepared by—

A This is the one that is prepared by my particular division, and it was primarily prepared for internal use, although we make public distribution. The utilities and industry use this kind of data in [785] determining their own marketing.

Q I see that on the first page of Defendants' Exhibit 107, the central station nuclear plants, under the column "Utilities considered likely to place orders in 1970," is listed the Commonwealth Edison Company. Also the Tennessee Valley Authority.

Could you tell us how you determine that such orders are likely to be made in 1970?

A Well, part of our function, as I said earlier, is to report annually, at least to our Commission, and keep our Commission informed of the commercial uses of nuclear power.

What we do here is to try and list from our contacts with American industry what actually we think will be in the marketplace in the next year for nuclear power.

This is in order to keep our Commissioners informed of the status of the industry.

We determined this by our contacts with both the manufacturers and our contacts directly with the utilities themselves. We have just recently changed this. We said "Likely to order," and it is done here just to give our own people a feel of what utilities are in the marketplace currently.

[786] Q I show you now, Mr. Tremmel, what has been received in evidence as Defendants' Exhibit 108. I ask you if that is the other compilation to which you have referred?

A Yes. This is the other public release that the Commission puts out. This was really the one that gets broader distribution. The one that we put out is directed more for the concerned industry's direct use. This is made more for the public. The both of these are coordinated carefully so that the figures are in general the same.

Q On Defendants' Exhibit 108, this gives you a listing of installations by state, does it not?

A Yes, sir.

Q On that there are installations listed in Illinois, Indiana, Wisconsin, Iowa, Tennessee, Michigan, are there not?

A Yes.

Q Now, Mr. Tremmel, what particular factors accounted for the growth of nuclear power starting in the year 1965, or 1963, as I believe you stated it really began?

A Well, we think the reason why the utilities went to nuclear power was primarily based on the fact [787] that nuclear power in competitive proposals came out more economical in the long run than the fossil plants.

We think that subsequently there are other factors which have pushed nuclear power—let me say which have influenced the utilities in purchasing nuclear power plants. One of these a few years ago in the 1966 and 1967 period was the concern over air pollution. We think that some of the utilities favored nuclear power because they thought it would be helpful in eliminating air pollution. But we think basically there is no question in our minds that the utilities bought nuclear power plants because in their judgment the power generator would be more economical to the customer from these plants than from fossil plants.

Q Has the construction of nuclear plants been limited to any particular area of the country?

A Not necessarily so, with the exception of the Rocky Mountain states, and the gas belts through Texas, where

there is very cheap natural gas. Nuclear power plants have been ordered in all other sections of the country.

[788] Q Would that include the midwest?

A Yes. Now, originally—I think it is important here to have a little background on this, if it is all right with the Judge.

THE COURT: You may proceed.

BY THE WITNESS:

A Originally we thought that nuclear power would first come into being in the New England states because there is no coal and the transportation costs for fossil fuels in New England has been high.

It has been known as a part of our country where the cost of electricity is high.

So, we predicted that nuclear power first would become economical there. Then we predicted it on the West Coast, primarily California.

Our predictions were quite correct on New England, but in Southern California, as you know, in the earlier days, nuclear ran into some opposition.

What happened is nuclear power came into being in the middle west and in the southeast, and we were surprised as to what extent nuclear power was ordered by utilities, such as Commonwealth Edison, and TVA, where we had figured because they were close to mine-mouth coal, it would be very difficult for nuclear [789] to compete for some years.

But what happened in 1966 and 1967 is nuclear power plants were ordered in all sections of the country, with the exception of the Rocky Mountain States, and the Gas Belt in the Middle South.

Q I believe, Mr. Tremmel, you have referred to the decline in orders for nuclear plants that took place in 1968 and 1969. To what do you attribute this decline?

A There are a number of factors which I think accounted for this decline. Number one, we knew at some time the pace of nuclear orders could not continue at the rate it had, because the utility industry historically is known for ordering on a cyclical basis. In other words, you will reach a curve where it will hit a high point (in-

dicating), and then there will be a low point in the ordering, and then another high point again.

If one looks at the years 1955, 1956 and 1957, that period, and plots the sale of turbine generators, you would see the utilities had been ordering at a rate that was doubling the capacity every two years. We know that the capacity of the country doubles every ten years, so it was obvious this rate of ordering could [790] not continue.

We think they ordered nuclear plants probably at this pace because it takes longer to build a nuclear plant, and, secondly, they wanted to allow themselves more time because this was a new technology. So we knew that there had to be a fall-off in nuclear orders.

Another factor is that if you examine the size of these plants that were sold, the utilities were ordering plants that were three times to four times the size of any plant in existence that had operated.

[791] Q That would be regardless of fuel type?

A Regardless of fuel type, so that it would only seem prudent that any large utility that had ordered two or three nuclear plants would want to wait until one or two of these plants started operating before they ordered many more, just to gain experience, and we think this was a factor.

Now, I think we should also not disguise the fact that building these nuclear plants turned out to be a much more involved problem than the constructors and architect engineers had envisualized, so that delays were encountered in the construction of these nuclear plants, which in some cases the utilities had to order fossil plants in order to have capacity on the line for when it was needed, and because of the delays in the construction of the nuclear plants.

Q Does the size of a nuclear plant have any effect on its cost?

A It has a very definite effect. Nuclear plants tend to be higher-cost capital plants than fossil plants, and it's only at about the 500 megawatt range that nuclear plants have been able to compete in the marketplace with fossil plants.

Now, as nuclear plants get larger, they [792] tend to be more competitive than the fossil plants. The advantages seem to favor larger nuclear plants over, the cost, over fossil plants, but still the capital cost is higher, where the operating cost of a nuclear plant is lower. This is a fixed, some fixed ground rules that one ought to accept.

Q Do you have an opinion as to, say, by 1975 the size of nuclear plants that will be offered for sale?

A Yes. We think by 1975 the plants being offered for sale will be in the 1,100 to 1,500 megawatt size.

Q If I may pause there, do you have sufficient facts at your command to have an opinion as to the amount of coal that an 1,100 to 1,500 megawatt coal-burning plant would consume a year?

A No, I don't.

Q At the present time, Mr. Tremmel, what do you estimate to be the average capital cost of a nuclear energy generating plant to be per kilowatt hours?

MR. SIMS: Your Honor, I will have to object to this. I do not think Mr. Hedlund established a foundation to ask Mr. Tremmel cost information of this sort. I think that in testifying as to his background he did not testify that he did any cost studies, or his particular [793] division was engaged in drawing up cost studies on these nuclear plants.

THE COURT: Do you have any comment?

MR. HEDLUND: Your Honor, I think his position speaks for itself in terms of his role in the function of the Division of Industrial Participation. I would assume that this would be something that they would try to keep a close check on.

THE COURT: Lay the foundation.

BY MR. HEDLUND:

Q Mr. Tremmel, does your division collect facts or data that would permit you to give me a knowledgeable estimate of the average capital cost of nuclear energy generating plants at the present time?

A Yes, we do.

MR. HEDLUND: I will rest on that, your Honor. I think that is sufficient.

THE COURT: Yes, Mr. Sims.

MR. SIMS: Well, if he has knowledge of the information and can testify to what information these cost studies are based on, then I have no objection, but otherwise I would object on hearsay.

THE COURT: All right. Proceed.

[794] BY MR. HEDLUND:

Q Mr. Tremmel, would you give us, please, a description of the type of information that you collect in this regard and the analysis done on it.

A We keep in close contact with the utilities, so that we can have some idea what the cost of nuclear power plants are running, and we prepare detailed breakdowns of what composes these costs. In other words, how much are capital costs and what the cost of the fuel cycle is so that we can furnish this information to our Commission.

For example, Commissioner Seaborg, Chairman Seaborg just came back from Japan where he made an international speech, and he made a statement in there of what the cost of nuclear plants are running today in the United States, and part of this information, our division contributed information of this along with other divisions so that our Commissioners keep informed of what the costs are running.

We also try to keep some general idea of what fossil plant costs are running, and we do this through talking to utility presidents and executives, and that is one of the functions of my division.

Q Then, Mr. Tremmel, I return to my question, [795] based upon the data which you have just described, can you estimate the average capital cost of a nuclear energy generating plant per kilowatt hour at the present time?

MR. SIMS: Your Honor, may I ask him one question on voir dire?

THE COURT: On voir dire?

MR. SIMS: Yes, sir.

THE COURT: I think the foundation has been laid. You have the right of cross examination.

MR. SIMS: He said he talked to electric utilities concerning the costs. I simply want to find out whether he got from them the awarded contacts that they received.

THE COURT: You have the right of cross examination. Objection overruled.

Proceed.

BY MR. HEDLUND:

Q Do you have my question in mind, Mr. Tremmel?

A Yes, sir. I would like to answer that two ways.

Originally, the nuclear plants that were sold, the companies like General Electric and Westinghouse, in order to promote nuclear plants, sold these plants at a rather reasonable price, and these plants [796] are usually averaged out so that in order to make a profit the company might have to sell 10 plants, so that the first plant would be considerably cheaper than it might cost to produce it. So, the utilities—we call it, so-called, buying into the industry—the utilities bought some of these early plants as low as $100 a kilowatt. These are published numbers by the utilities in some cases. In the Florida Power & Light, for example, they bought two plants at less than $100 a kilowatt. The later plants, then, that are on order, they begin to go up to 140, 150 and 170 dollars a kilowatt, so that the present plants under construction, when they are completed, will probably average around $170 a kilowatt because there have been significant increases in these plants, the cost of construction, since many of them were ordered.

Currently, from the best information we have assembled, nuclear plants are selling from around $190 to $240 a kilowatt, and Dr. Seaborg just used in his Japan speech, $200 to $240, to give some idea of what the present large plants are, and if you will look at the list, I believe it is your DX-107, we give some indication of the cost of the plants.

If you look at the first page, at the top, [797] you will see a Cincinnati Gas & Electric Company plant that was

sold by GE, 810 megawatts, and you will see the estimated cost is $179, so that—

Q That is $197, is it?

A Pardon me, $197 million dollars, so that you can get some idea of what these plants are costing.

[798] As I say, if one extrapolates this to kilowatts, you begin to get a feel of the cost per kilowatt.

Q The estimated cost figures in that column, those are not per kilowatt, that is the total cost?

A No, you have to divide that by the size.

Q If the tendency to larger plants increases, will there be any reduction in the cost per kilowatt?

MR. SIMS: Your Honor, I will object to that as speculative.

THE COURT: What is that?

MR. SIMS: It is speculative.

THE COURT: If the witness knows, if they have estimates, he may answer.

BY MR. HEDLUND:

Q Do you have such estimates?

A Yes, we have done studies in the Commission of the trend of cost for large nuclear plants, and we think that the larger a nuclear plant is built, it will tend to decrease the cost, the capital cost. Of course, I don't want to mislead anybody here that that means cheaper power. Inflation might make the cost somewhat higher, but what I am saying is that the larger the size of the plant, there is a tendency for the cost, [799] the capital cost, to come down. That's what our studies show.

Q Compared to fossil fuel plants, is there any saving in the cost of fuel involved in a nuclear generating station?

A Yes. Inherently, as I explained earlier, a nuclear plant will operate, just strictly fuel cost, considerably cheaper than a fossil plant, and although the capital cost is higher, when you balance the total cost, this is why the utilities have gone to nuclear, because the total operating cost will tend to be lower in many cases due to the cheaper fuel cost.

Q Do you have sufficient facts, or have you developed sufficient data, so that you would be able to estimate the final capital cost for nuclear plants which are planned to come into operation in the period 1974 to 1975?

A Yes. As I said earlier, we think they'll average around $170 a kilowatt.

Q In your opinion, Mr. Tremmel, has the differential between capital cost of building a nuclear station and the capital cost of building a coal-fired station remained the same over the past four years or has it spread?

[800] A No, it's remained essentially the same. The Commission, in our speeches by our Commissioners, have said that in general the differences in capital cost will be between $30 and $40 a kilowatt. It was that way five, six years ago, and the current difference would still, from the best of our estimates, be about that, and incidentally the Federal Power Commission, in their public statements, have estimated about the same differences.

Q In your opinion, Mr. Tremmel, is nuclear energy presently a competitor of coal as an energy resource for the generation of electricity?

A There is no question in my mind but it is.

Q Since approximately what year or years has nuclear energy been such a competitor?

A Since approximately 1965.

Q Is nuclear energy, in your opinion, a competitor of coal as an energy resource for the generation of electricity important even in coal mining areas of the United States?

A Based on the orders placed by the utilities, we would assume it is.

Q If we may go back again to the future, Mr. Tremmel, do you expect that nuclear energy will continue [801] to increase its penetration of the electrical generating business between now and 1980?

A The Commission has given out official forecasts, and our latest official forecast is that by the year 1980 there will be 150,000 megawatts of nuclear capacity installed in the United States. The present amount on order, operating or under construction, as I said, is

close to 80,000. This means we are predicting that another 70,000 megawatts will be ordered and installed and operating by 1980.

[802] Q About what percent of the total generating capacity in 1980 will that represent, if you know or have an opinion?

A Yes. The reason I hesitate is we base a lot of our estimates on the Federal Power Commission studies of the total amount of electricity required by our country, and the Federal Power Commission has just, in public testimony, released some new estimates. They have changed their estimate of the total amount of electric generating capacity required in the United States in 1980 from approximately 600,000 to approximately 680—pardon me—that's million kilowatts. Based on that, our 150,000 would represent somewhere around between 20 and 25 percent of the total generating capacity installed.

Q By 1980?

A By 1980.

Q Would this mean that nuclear would also be responsible for 20 to 25 percent of the electricity generated?

A No. We estimate that it would be responsible for a higher percentage of electricity generated because in general the nuclear plants will be operated as base load plants. They are large and they will be [803] kept on the line more than the other types of plants, so that it might account for between 30 and 35 percent of the electricity generated in the United States by 1980.

Now, these are just our best estimates.

Q Are you familiar with the estimates published by the Edison Electrical Institute?

A Only very generally.

Q Do you know what the Edison Electrical Institute's estimates are at present with respect to 1980?

A I don't believe they've come out with any recent estimates, but three, four years ago their estimates were somewhat higher than ours. I think they were estimating around 170 to 190.

I would like to say that if one got the Commission's official document, our estimate is a range. We're estimating 130 to 170,000 megawatts by 1980, with a

medium of around 150, so that we tend to use the 150 as the estimate that we expect to be reached.

Q Do nuclear fuel power plants offer advantages or disadvantages over fossil fuel power plants with respect to air pollution?

A We feel in the Atomic Energy Commission that [804] they offer advantages, since there is practically no air pollution of any kind from a nuclear plant.

Q Does this benefit, in your judgment, have any effect upon the competitive position of nuclear energy in the electrical generating field?

A Yes, we think that it definitely has effect, and one of the reasons for this is the fact that in southern California they will not allow any more fossil plants to be built because of the air pollution problems so that southern California will be committed to nuclear plants only in the future.

MR. HEDLUND: May I have just a moment, your Honor, and I will try to shorten this.

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. HEDLUND:

Q Is the Atomic Energy Commission presently working on the development of more advanced types of nuclear reactors for electrical generation?

A Yes, we are. In our program, I have explained the light water reactors. We have been working on two other types of power plants that we call more [805] advanced. One of these, the high-temperature gas-cooled reactor, is being developed by Gulf General Atomics, who recently bought out this gas cooled program from General Dynamics, and it's located out in LaJolla, California.

Gulf General Atomics has just recently submitted a proposal to the Eugene Water & Electric Board on an 1100, approximately, megawatt gas-cooled reactor. The difference would be that this reactor would use gas as a coolant instead of light water.

[806] GE has quoted on a boiling water reactor. Westing house, B&W and Combustion have all quoted on pressurized water reactors, so that this utility received five proposals, and Gulf is hoping to now enter the field with their first commercial high-temperature gas-cooled reactor. This reactor will operate at higher steam pressures and temperatures, so that its efficiency as far as the amount of cooling water discharges would be the same as a fossil plant.

The present nuclear plants discharge slightly more heated water than an equivalent-sized fossil plant.

The high-temperature gas-cooled reactor offers, should offer, two advantages. One is discharge of less heated water, and the other is it would burn up less uranium than a light water reactor.

Now, coming behind that, the AEC today, we have phased out of the Government supporting light water reactors. We are still supporting some support to the high-temperature gas-cooled, but our main effort today in the Government is directing our funds toward developing a breeder reactor. Now, the difference between a breeder reactor and these others is that a breeder reactor will actually make more fuel than it consumes. [807] In the light water reactor, when you are burning up the uranium, the U-235, you actually make in the fuel elements some additional fuel by converting U-238 to plutonium, so you are generating some additional fuel, but very little.

In a high-temperature gas-cooled reactor, you make more of this plutonium, and in a breeder reactor, you convert enough of the natural uranium that is not used in the reactor to plutonium, so that the breeder reactor actually generates enough fuel to refuel itself with slightly over, to start refueling another reactor.

Our goal in the Commission is the breeder reactor as the ultimate, because it would mean that we would have almost unlimited resources for power in our country.

Q Your description of the fuel aspects of it, is this what is sometimes referred to as a negative fuel cost?

A Yes.

Q When do you believe that the breeder reactors will be commercially available?

A The Commission has a target to try and have breeder reactors commercially available in the 1980's. We have not been specific on any year because it's very [808] difficult to estimate that, but our goal is to, at the end of this year, select a reactor manufacturing utility in combination with the AEC to build a demonstration plant similar to the Yankee and Dresden. This would be a plant, though, of 500 megawatts.

Hopefully, after that plant has been built and operated, we would hope that the manufacturers would be offering these plants commercially later on.

Q In your opinion, Mr. Tremmel, will nuclear energy continue to afford to utilities a choice in the type of plant they decide to buy?

A We are committed in the AEC to develop competition in nuclear industry, so that as far as within the nuclear industry itself, we see a utility having a choice from five suppliers of three different types of machines. If the breeder comes in in 1980, it would offer probably a sixth supplier, and a fourth concept to choose from.

Q Would nuclear energy also afford a choice for utilities as among energy sources?

A Yes. We've stated consistently since 1963 that atomic energy is not going to put fossil fuel out of business, but is part of the energy team. The demand in this country for energy is so great that we've said [809] it is going to take a lot of energy resources to meet it, and we feel that nuclear power is part of this energy team for the future.

I wanted to just add one more thing about the breeder program, and that is that the Commission is concentrating—there are a number of different types of breeders. We have concentrated on what we call a fast liquid metal breeder reactor as the first one we would try and bring commercially into use in the United States.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

[810] Q Mr. Tremmel, I would like to ask you whether you agree or disagree with the following statement—

THE COURT: What page? Is this in the transcript?

MR. HEDLUND: I am going to rephrase something from the transcript, your Honor.

THE COURT: All right.

BY MR. HEDLUND:

Q Do you agree or disagree with the following statement:

> "The presence of nuclear power as a competitor has assisted materially in controlling the cost of fossil fuels."

Do you agree or disagree with that statement?

A Yes. We believe that nuclear power has been an effective mechanism to help keep the cost of electricity down in the United States.

Q In your opinion, in the long term what combination of generating units will provide the lowest cost electricity?

A Well, we like to think that it will be a combination of nuclear, pump storage, with gas turbine for peaking units.

Q One final question: How many orders for nuclear fuel generating stations do you expect will be [811] placed in the next two or three years?

A We expect that there will be around between 10 and 15 plants each year for the next few years.

Q This would be a higher level of ordering than was experienced in 1969?

A Slightly higher. If you put two of these orders back in 1969, you had nine plants. We expect, as I say, 10 to 15 in these two years. I might say that at the rate of 10 to 15 plants a year, we can easily reach the 150,000 megawatt estimate for 1980.

MR. HEDLUND: Your Honor, may I have just a moment to confer with my associate?

THE COURT: You may.

> (There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Your Honor, that is all we have.
THE COURT: You may cross examine.

[812] CROSS EXAMINATION

BY MR. SIMS:

Q Other than electric utilities, Mr. Tremmel, are there any other coal consumers at the present time in a position to burn nuclear fuels?

A I am sorry, but would you repeat the question, please?

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A There are only two other potential areas. One is process heat. There have been two nuclear plants sold to the Consumers Power Company in Michigan that will be located in order to provide both electricity and process heat to the Dow Chemical Company.

There was an article in Nucleonics Weekly several weeks ago that the Eastman Kodak Company is considering a nuclear power plant to supply process heat for their Eastman Kodak Park.

One other area that we see a potential for nuclear energy is in central station heating. If at some day in the future it is possible to locate nuclear plants in highly populated areas, like New York City, one could use the heated water for central heating like some of the cities used to have. But that is some years [813] away.

But the process heat, as I say, Dow Chemical and Consumers together are building two plants now to use both electricity and process heat. Those are the only two areas that I foresee right now.

Q Are nuclear fuels burnable at generating stations designed to burn coal, gas or oil?

A No, they are not.

Q Generating stations burning gas, coal or oil are generally referred to as fossil fuel plants, is that correct?

A Yes, sir.

Q How did the AEC go about preparing this 1967 forecast of nuclear power?

A The forecast—?

Q The most recent one.

A I see what you are talking about, yes. That is done by a number of divisions in the staff. We have a division called Division of Operations Anaysis. This division is a group of economists and technical people whose job it is to develop forecasts for the Commission. The Government, you see—well, we didn't get into any testimony today on the nuclear industry that supplies fuel to these plants, but the only service [814] today that private industry does not supply to a utility is the enriching function. The AEC has transferred all of its activities and created a competitive industry in all areas except this enriching.

* * * *

[819] AFTERNOON SESSION

2:15 P.M.

* * * *

ERNEST TREMMEL,

called as a witness by and on behalf of the defendants herein, having been previously duly sworn, resumed the stand and was examined and testified further as follows:

CROSS EXAMINATION

(continued)

BY MR. SIMS:

* * * *

[820] Q Do electric utility executives come to you from time to time for advice on building a nuclear plant?

A Yes, they do.

Q Assume an electric utility executive came to you at the present time knowing very little about nuclear power, but indicated to you that he was interested in building a nuclear plant.

What differences, if any, would you point out to him between a regular fossil plant and a nuclear plant?

A I would point out that the technology, nuclear technology, is much more detailed and complicated than a fossil plant, and that the utility ought to start building up a staff at the very early period of time so that they will have experience at such time as they are ready to purchase a nuclear plant.

[821] I would point out that there is a licensing procedure to go through on a nuclear plant which involves the other side of the Commission, and that our responsibility under the Atomic Energy Commission is to only license plants that we feel are safe from a health and safety standpoint for the public, so to that extent the utility ought to start preparing at an early date and training people so that they will be equipped to purchase and operate a nuclear plant.

* * * *

[823] Q Well, what would you tell the executive who came to you at the present time and wanted some assurances that the nature and scope of the licensing requirements would not change in the near future?

A I would tell him that we could not guarantee that it would not, but that in general we don't see any major changes.

Q Would you point out to him any differences in the lead time necessary to build a nuclear plant?

A Yes. I would point out that it is estimated it would take from five to seven years to build a nuclear plant, whereas one would build a fossil plant normally possibly in four to five years.

THE COURT: Can you hear the witness, Mr. Hedlund?

MR. HEDLUND: Just barely, your Honor.

THE COURT: Would you speak up a little louder, please? We have noise out in the hall. This is moving day. They are moving a lot of furniture, and so on, into my chambers.

THE WITNESS: Surely.

BY MR. SIMS:

Q If the executive told you he had to get the electrical capacity on the line in about four years, would you recommend in that situation that he explore [824] nuclear?

A I would recommend that he discuss with the reactor manufacturers to see what kind of guarantee he could get from them. But in general four years is a pretty tight schedule to plan on a nuclear plant based on the experience to date.

* * * *

[827] BY MR. SIMS:

Q Would you recommend that an electric utility company be of any particular size and installed generating capacity before considering nuclear power, assuming that the electric utility was not in a position to sell substantial portions of the nuclear power to other electrical utilities?

A No, I would not, because I think the utilities have to understand their own system.

Let me say this: that I don't know of any case where a utility would come and ask me that. I would be surprised that they didn't know what kind of back-up capacity they needed. I have never been asked that, because the average utility knows his system pretty well. I don't think I would be as expert in their area as the utilities would, as to what his situation is.

Q Have any electric utility executives representing an electric utility system having about 1,000 megawatts or less come to you to discuss building a nuclear station?

A Yes. The Eugene Water & Electric Board has. Their largest generating plants—and this is a municipal, in Eugene, Oregon—the largest plant they have in their system is 150 megawatts. They purchase [828] probably another 500 megawatts from Bonneville Power. They have just obtained proposals for an 1100 megawatt plant from five reactor suppliers.

The only assumption one can make which they published was that they sell part of this power. There is an agreement in the Northwest between all the utilities as to who buys what and when and whose system.

The interties in this country has greatly changed this whole situation. So it is hard to say what utility will purchase what size plant any more. That is my experience in the last two years.

[829] Q Did you testify on direct that the nuclear plant had to be of a particular size before it was economic as contrasted to a fossil fuel plant?

A Yes. I said starting about 500 megawatts. Under that a nuclear plant generally is not competitive. There could be situations in extremes, like Hawaii, where there are no interties, where a smaller plant might be. But in general that is somewhere around the 500 megawatt size where it becomes competitive.

Q If a utility executive came to you, then, and told you they wanted to build something that was going to be less than 500 megawatts, would you suggest then that they consider seriously a nuclear power plant?

A I would suggest that they talk to the reactor manufacturers, because I would doubt whether they would be able to get a proposal for under 500 megawatts, although there is a plant, Port St. Germaine, which is a gas-cooled reactor, and that is 330 megawatts. That is being built more as a prototype demonstration plant. But Gulf General Atomics has said they would consider building a duplicate of that; but it would be pretty high-priced. Chances are a 500 megawatt plant might come in at about the same price, because the manufacturer, if he has to tool up separately, it is going to cost more.

[830] Q You don't think the manufacturers in the future will manufacture sizes of 500 megawatts or less?

A That is hard to tell. There are many parts—not many, but there are parts of the world where the demand might only be for a 200 or 300 megawatt plant. One of the problems has been in the American Public Power Association, which represents the municipals, they have complained to the AEC and have encouraged us to do more work in trying to develop a small plant that the municipals could use and that parts of the world where they have unusually high fuel costs could use.

But in general in the United States, the continental United States, there doesn't seem to be much of a market

where a small nuclear plant could be competitive.

[831] Q What size of plants, nuclear plants, would the municipal companies be interested in?

A They were interested in plants under 500 megawatts. But in the last two years, especially the last year, there has been a tendency for the municipals to pool together. This is what our Commission has encouraged the APPA to take a look at, that is, the municipals joining together so they can build a larger plant so that the economics favor the larger plant.

So if you build smaller, you are going to get more costly electricity.

Q The present licensing scheme under the Atomic Energy Act of 1954 provides for two classes of licensing for a nuclear power project, is this true?

MR. HEDLUND: I am going to object to this.

THE COURT: Have you finished the question?

MR. SIMS: Yes.

MR. HEDLUND: I believe the regulations speak for themselves.

MR. SIMS: This is a preliminary question.

THE COURT: It is a preliminary question; otherwise, the motion to strike will be considered.

Do you recall the question?

THE WITNESS: Would you repeat it, please?

* * * *

[857] RUEBEN THORSON,

called as a witness by and on behalf of the defendants herein, having been previously duly sworn, was examined and testified further as follows:

THE COURT: You may proceed.

MR. CUSACK: Thank you, your Honor.

CROSS EXAMINATION

BY MR. CUSACK:

* * * *

[865] Q Did you know, sir, whether or not the stock in United Electric owned by Investors Incorporated was acquired by the Crowns themselves?

A I do not know whether that was bought by the Crowns or by the Material Service Corporation. I think it was suggested that (we) bought it, and I just assumed that that was for the company.

Q But you didn't know?

A I did not know.

Q Mr. Thorson, on direct examination you testified at page 585 of the transcript that although your knowledge was "very slight" of the United Electric-Truax merger discussions, there was not much interest on the part of Truax "if I remember correctly."

Mr. Thorson, did you ever speak with anyone from Truax or with any representative of Truax in regard to this matter?

A Never. I didn't know anybody over there at that time. Years ago I knew Mr. Truax, but in recent years, no.

Q You mentioned, Mr. Thorson, that the Truax-United Electric merger discussions were discussed "very brief," at the United Electric Board meetings. Do you recall, sir, who brought up the matter at the Board [866] meetings?

A I don't know. I think it may have been Mr. Morris. Wait a minute. Was Mr. Kolbe there then? I think Mr. Kolbe remained on, if I recall. Was it two years after I came on the Board before he stepped aside? Was it a year or two?

Q Yes, sir.

A I can't tell you who brought it up, but the chairman may have brought it up. That's all I can say. I can't say for sure. I remember that the matter was brought up once or twice in a very casual way and there was a rather short discussion, because there didn't seem to be

any interest on the other side. That was the conclusion I drew. The thing sort of fell of its own weight. That is the impression I got. I never pursued the matter.

[867] Q Is this impression based on comments which were made at the Board of Directors meeting by other directors?

A Yes, that there seemed to be a lack of interest on the part of Truax.

Q And on this basis you obtained this impression that Truax had a lack of interest?

A That's correct. That was just a supposition on my part.

Q Did you ever discuss the possible Truax-United Electric merger with any of the Crowns?

A No.

Q Mr. Thorson, Harold K. Pedersen, treasurer of General Dynamics, whose deposition is in evidence, testified as follows—

MR. HEDLUND: One moment, Mr. Cusack, if I may. May we have an opportunity to get the transcript so that I may follow it?

MR. CUSACK: I will lend you mine. Well, no, I don't have it.

MR. HEDLUND: I am sorry for the interruption, your Honor.

THE COURT: It is all right.

* * * *

[890] BY THE WITNESS:

A I would say that normally the securities are fully paid for at the time when the tender offer is effective. Now, there may be other arrangements made that I'm not familiar with.

BY MR. CUSACK:

Q Thank you, sir.

Mr. Thorson, you testified at page 588 of the transcript that Freeman was:

(Reading) ". . . very familiar with the problems of deep mining and offered the services in every way

they could to be helpful to United Electric in that area".

You also testified on Thursday at page 589 of the transcript in regard to the Round Prairie field, that:

(Reading) "It was suggested obviously that if they went ahead with that, Freeman would be very helpful or perhaps would be very helpful in undertaking that project."

Do you recall the June 10, 1964, Board of Directors meeting of United Electric, which meeting you attended, according to the minutes, and at which meeting, according to page 4236 of the minutes the [891] directors present unanimously approved options to lease "covering approximately 1,610 acres in Round Prairie Field, Perry County, Illinois, containing an estimated 9,658,023 tons of coal"

A Lease to who?

Q A lease to United Electric, sir. Do you recall that incident, the acquisition of 9,658,000 tons of underground coal at Round Prairie in 1964, June 10—excuse me, January 10?

A I must be frank and say that there were so many parcels of acreage acquired here, there and everywhere, that I can't specifically—I know that they were interested in Round Prarie, but specifically I can't give you a definitive answer. I'm sorry I don't remember.

Q Perhaps I can shorten this up, sir.

You do recall a number of occasions when you were a director that United Electric did acquire underground acreage at Round Prairie do you not, sir?

A Yes, that's right.

Q Mr. Thorson, do you recall what the arrangements were, if any, whereby Freeman would be very helpful or perhaps would be very helpful in undertaking the mining of the Round Prairie Field?

[892] A No. Of course, I'm getting way over my depths as far as the coal business is concerned. My knowledge is very limited, indeed, and I hoped that this wouldn't get into that area, because I'm a novice.

I do know that—I've been told that Freeman had deep mining operations, that United Electric was a stripping operation, and that they tried deep mining once before and it wasn't successful, and I felt that they would lean heavily on the resources of knowledge and know-how that Freeman could help them with in this area, and that's just a generality, but that's the conclusion I reached.

Q Mr. Thorson, do you know, during the time you were on the Board of United Electric, whether the management of United Electric ever consulted with any other underground coal producer in regard to the Round Prairie Field?

A I don't know.

Q Mr. Thorson, was it not stated by the officers of United Electric at the Board meetings that United Electric itself planned to mine the Round Prairie Field?

A I don't recall that. I hate to be evasive, but I don't recall that. You mean alone, without the assistance of others?

[893] Q With perhaps using some other company's technical benefit being paid for by United Electric, but to mine it themselves?

A Well, I never drew the conclusion that deep mining in the Prairie Field was an imminent development. I sort of felt that was something for the future, correlated to the acquisition of other contiguous properties for another buyer, but if they decided to develop it, they would probably look to United Electric to develop the coal property, and this conglomerate referred to in the testimony.

Q But, was it not the intention when they had acquired additional reserves in that area that United Electric itself would undertake the mining of Round Prairie?

A I think perhaps that was the idea.

[894] Generally it was not thought by the directors that they would merely turn over a corporate opportunity in Round Prairie to Freeman?

A Oh, no, no, not in that sense. I think they were going to lean on them for some help that was offered by Mr. Nugent.

Q This help was to be reimbursed for, I assume?

A I presume so.

Q Mr. Thorson, do you recall a research bulletin of Paine, Webber, Jackson & Curtis of September 9, 1959 in regard to the coal industry in general and United Electric in particular?

A No, I don't as of today. I know we had one at that time. As of today, but I don't recall having read it in the past, and I didn't read it today for certain reasons.

MR. CUSACK: I would like the Reporter to mark for identification as Government Exhibit 109 Research Bulletin of Paine, Webber, Jackson & Curtis, Volume 23, No. 59, dated September 9, 1959.

(The document was thereupon marked as Government Exhibit 109 for identification.)

* * * *

[902] Q In regard to the Industry Field, Mr. Thorson, as you recall that is the strip coal acreage located in Schuyler-McDonough Counties?

A Yes.

Q Is it not a fact, sir, that it was stated at United Electric's Board meetings that United Electric would someday mine the Industry Field?

A That was the implication. That's the conclusion I drew, yes, but it was a backlog reserve, not foreseeable future, but some way down the road.

Q Yes, sir.

Mr. Thorson, you testified at pages 586 and 587 of your direct examination that United Electric had a strip coal reserve problem, although you stated that:

(Reading) "I am no expert in the coal business. I want to make that eminently clear. But these discussions came up, and the enlarging of the reserves was very difficult to achieve and they had real problems."

Sir, the information which you obtained in regard to United Electric's reserves was at the Board of Directors meetings of United Electric, is that correct, sir?

A That's correct.

[903] Q The information which you had in regard to United Electric's reserves was from the officers of the corporation in general and Mr. Nugent in particular, would that be fair to say?

A It was carried in the annual reports, and the auditors certified the reports, so I felt there was integrity in the estimates of the reserves.

Q Yes, I understand.

Is it not a fact, Mr. Thorson, that Mr. Nugent was primarily interested in acquiring strip reserves at United Electric's four operating mines?

A I think he was interested in acquiring strip reserves almost wherever they were available, even as far out west as Idaho or Nevada, wherever we acquired some reserves.

Q Did you ever visit any of the mines of United Electric, sir?

A I never visited a mine, I'm almost ashamed to say, but I never have.

THE COURT: It's not too late.

THE WITNESS: Someday I will have an opportunity, I hope.

• • • •

[913]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLIINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before the HON. EDWIN A. ROBSON, Judge,

Tuesday, April 7, 1970,

10:40 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN, and
MR. RICHARD J. BRAUN,
appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,
appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM.

[930]

* * *

ROBERT W. STEELE,

called as a witness by the defendants, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your name, sir.
A Robert W. Steele.
THE COURT: Will you spell your last name.
THE WITNESS: S-t-e-e-l-e.

BY MR. KEMPF:

Q What is your home address, Mr. Steele?
A 275 Southgate Drive, Dubuque, Iowa.
Q By whom are you employed, sir?
A I'm employed by Interstate Power Company, with general offices in Dubuque, Iowa.
Q What is your position with Interstate Power, Mr. Steele?
A I'm president of the company and chief operating officer, and I'm also a director of the company.
Q What is your business address in Dubuque?
A 1000 Main Street.
[931] Q Mr. Steele, when did you join Interstate Power Company?
A Nearly 30 years ago. I started with Interstate Power Company in 1941 as power sales engineer, and over the years have held various responsibilities in sales, in production department and on the corporate staff.
Q When did you become president of the company?
A I became president of the company on January 1, 1966.
Q As an executive with Interstate Power Company, have you played an active role in the company's plant construction and fuel procurement decisions?
A Yes, sir. I have been in the Engineering Department, I have worked in the Production Department, and over the years have participated in the decisions that have been affecting our company in regard to power

plant construction, substation construction, fuel procurement and the like.

Q Are you a professional registered engineer, sir?

A Yes, sir. I am registered in the state of Iowa.

Q Mr. Steele, could you describe for us [932] briefly the service areas served by Interstate Power Company?

A Yes, sir. We serve in north eastern Illinois, in northeastern Iowa, central Iowa and throughout the southernmost portion of the state of Minnesota.

Q I would now like to show you what has been received in evidence as Defendants' Exhibit 144, a map entitled "Investor-Owned Electric Utility Service Areas," and if you could step down and indicate on this map the specific service areas served by Interstate Power, I would appreciate it.

A The area served by Interstate Power Company is this blue area (indicating) in the general area I have just discussed, and it is labeled "63."

Q 63 identifies it as your service area?

A As Interstate Power Company.

Q What electrical generating facilities does Interstate Power Company operate, Mr. Steele?

A We have electric generating plants, three on the Mississippi. We have a large station at Clinton, Iowa, with gross capability of 256.5 megawatts; we have another plant located at Dubuque, Iowa, with a gross capability of 97 megawatts; we have another plant located at Lansing, Iowa, with a gross capability of [933] 65 megawatts. We have a plant at Mason City, Iowa, with a gross capacity of 27 megawatts; we have another plant at Albert Lea with 20.5 megawatts of capability; and, we have a plant at Fox Lake, which is near Sherborne Minnesota, with the capability of 114.5 megawatts.

[934] Q Your Lansing station, is that also on the Mississippi River?

A Yes, sir.

Q What is the fuel that is used by Interstate Power at its electrical generating stations?

A Well, we use a variety of fuels depending upon the time of the year, the plant, the various costs that are involved, so that we use various fuels throughout our entire system.

Q All right.

Turning to your three Mississippi River stations, what fuel do you use at your Clinton, Iowa facility?

A We use coal and gas, and the ratio there is about 80 percent coal, about 20 percent gas.

Q What fuels are you using at your Dubuque facility?

A There we're using coal and gas. This used to be predominantly a hundred percent coal plant, but in the last few years we have been burning approximately 50 percent coal and 50 percent gas, primarily because it is in a downtown metropolitan area, and air pollution is becoming a problem.

Q What about the Lansing facility?

[935] A The Lansing plant is predominantly—in fact, it's a hundred percent coal. We have not yet installed any gas capability at Lansing.

Q What fuel do you use at your Mason City plant?

A There we use a combination of gas and oil. We use approximately 80 percent gas and about 20 percent oil.

Q Do you have a coal capability at that plant?

A No, we do not. We used to have capability to burn coal, but it became uneconomical and we retired the coal facilities.

Q What about the Fox Lake facility in Minnesota?

A Fox Lake uses three fuels. It has gas, oil and coal. Approximately 23 percent of it is oil and 7 percent of it could be coal, and the balance in gas.

THE COURT: 7 percent or 70 percent?

THE WITNESS: 7 percent, sir.

THE COURT: 7 percent. All right.

BY MR. KEMPF:

Q Do you expect that you will continue to burn coal at that station?

A No, sir. While we do have the capability, the recently-enacted pollution criteria in the State of [936] Minnesota lead us to believe that rather than put in a million four hundred thousand dollar electronic or electrostatic precipitators, that we will probably change over to burning oil.

Q Finally, what fuels are used at your Albert Lea facility?

A There we use a combination of gas and oil. I believe there the breakdown is roughly perhaps 80 percent gas and 20 percent oil.

Q Are these various fuels, gas and oil and coal, in competition for the business of Interstate Power Company?

A Yes, there's a great competition for our fuel between not only the coal producers, but oil and gas, and, of course, there's always nuclear power that has to be factored into any generating that we're looking at today.

Q Where are the mines from which Interstate Power Company procures the coal which its Mississippi River facilities burn located?

A All of our coal that is burned in the Mississippi River plants comes from the Belleville District.

[937] Q Why is that?

A Well, the economics involved in the purchase of coal and the transportation to the destination at the power plant has to be considered as a whole, and these mines located near the Mississippi River, of course, have a short haul to the dock, and it has been economical for us to purchase our coal from this area.

Q You say they have a short haul to the Mississippi docks. Why is that?

A Well, this is short in comparison to other coal fields in the southern Illinois area.

Q What about design specifications? Are those a factor in your fuel purchasing decisions?

A Yes. As you know, a boiler is a very complicated piece of equipment, and the decision that must be made as to the design influences the cost of the eventual boiler, and we have designed our boilers to burn certain characteristic coals and this, of course, then leads us to the purchase of these coals over a long period of time to obtain the maximum efficiency of our boilers, and it has come about over the years that the Belleville district supplies us with the most economical coal.

Q Would you be able to burn coal from any midwest mines in your boilers?

[938] A No, we could not, because there are coals that have a different characteristic than what we would like to burn, and we have to keep at rather close tolerance on the coals that we purchase so as to not adversely affect our operating situation at our various power plants.

Q Could you give us some specific examples of situations where you would not be able to burn a particular type of coal?

A Well, we have designed our boilers for the purpose of burning wash coal, and so this would preclude some of the coals from being burned in our boilers, not to say that they couldn't be burned, but they would give us so much difficulty it would become a severe operating problem. Some of the fuels, the coals, have different fusion temperatures, and this, then, becomes a matter of operation.

Q Does Interstate Power buy any coal on the spot market?

A Almost none.

Q Why is that?

A Well, these power plants, of course, are heavy investments, and our requirement as a regulated industry to our customers requires that we maintain [939] adequate fuels and have the ability to purchase fuels over a long period of time to insure this reliability.

Q Of how long a duration are Interstate Power Company's coal supply contracts at the present time, Mr. Steele?

A Our present contracts are 10-year contracts. We have, of course, looked at these and would perhaps be interested in longer term contracts, maybe 15 to 20 years.

[940] Q Do you anticipate that trend toward these longer type contracts would continue in the future?

A Well, I am not too sure. A few years ago I would have said yes, but today, with nuclear fuel, with other problems that are facing utilities, I believe that we perhaps would be looking at shorter-term contracts.

Q Is Interstate Power presently operating any nuclear power generating stations?

A No, sir. We are not. We have participated in the research and development of the Pathfinder Plant that was built by Northern States Power Company. We have kept ourselves familiar with the technological advancement in the nuclear field, and each time we look at additions to our generating capability, of course, we would look at nuclear as a competitor along with the fossil fuel plants.

Q You also referred to other factors faced by a utility. Would one of those be air pollution?

A Certainly this is a situation that is coming to the front very rapidly, and utilities faced with prescribing to the regulatory criteria that are being issued state by state.

Q How would you characterize the degree of competition for the fuel and supply business of [941] Interstate Power at the present time, Mr. Steele?

A Well, the competition is there, because we have a number of coal suppliers who can supply us, and we also are being asked to use gas as a fuel more and more to combat air pollution. As I have indicated, we also look at oil, again because of the sulphur problem, and we also each time we view nuclear.

[942] Q What effect, if any, does the combined ownership of Freeman and United Electric by General Dynamics have on the competition for the fuel business of Interstate Power Company?

A I don't believe that this adversely affects Interstate Power Company, because we look at our supplier, United Electric, from whom we have been purchasing coal for over a quarter of a century, and I don't see any effect at all.

Q Do you see any adverse effect to your company if these two companies, United Electric and Freeman, were forced to operate independently?

A Yes, I do, because this has been of some concern to Interstate Power Company, and a number of years ago I reviewed with our operating people, our production people, the problem that we saw on the horizon, which was the diminishing reserves situation with United Electric, and this causes some concern as to what our future relationship would be with United.

Here is a situation where I think one compliments the other. Of course, reserves is a very critical part of the reliability factor for utilities in the years ahead.

MR. KEMPF: I have no further questions.

* * * *

[943] CROSS EXAMINATION

BY MR. BRAUN:

* * * *

[944] Q Can your burn any coal in your Kapp Station irrespective of its dust content?

A The answer to that, of course, is that you can attempt to burn anything that you can put into the boiler, but I must caution you that as a public utility we are charged with furnishing 100 percent continuity of service, and we cannot experiment with any and every type of coal. We know what our boilers were designed for. We know that we have to stay within a close tolerance. For us to jeopardize our reliability by taking any and all coals would not be wise.

Q Do you recall, Mr. Steele, filling out the Court's subpoena questionnaire with respect to the dust tolerance of your facilities at the Kapp Station?

A I recall looking at them and signing the letter that forwarded them in here, but it has been some time since I had seen these particular statistics that you refer to.

Q Do you recall specifying any dust content of the coal which can be burned at that facility?

A No, sir.

Q Is it not true that you can burn coal with sulphur content of less than 3.5 percent?

A You can burn coals that have varying amounts [945] of sulphur, yes.

* * * *

[951] Q With respect to your Dubuque station, Mr. Steele, what is the delivered price per million BTU's for coal?

A Well, again, you are testing my memory. As I pointed out, this information is in the subpoenaed documents. But I recall that our delivered fuel cost there is in the neighborhood of twenty-five, twenty-six cents a million BTU.

MR. BRAUN: Your Honor, may I confer with co-counsel for a moment? I do not believe this information is in the questionnaire.

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: I would like to state for the benefit of the Court, your Honor, that the responses to the subpoena questionnaires are not in evidence, but in the light of comments made by counsel, we will put them in our rebuttal case. We also will put in a summary of the information contained therein.

MR. KEMPF: The original letter of last June by the Government indicated they were going to put these in. Besides, that, the parties have reached an agreement [952] that either party is free to use the subpoena answers.

THE COURT: Then it is not necessary, and the record may show that this witness has responded and that they are of record and that will cover it.

MR. CUSACK: Thank you, your Honor.

MR. BRAUN: May I confer with co-counsel again, your Honor?

THE COURT: Yes.

(There was a short interruption, after which the following further proceedings were had herein, to-wit.)

MR. BRAUN: I apologize for delaying you.

THE COURT: It is all right.

BY MR. BRAUN:

Q Mr. Steele, can you tell me in cents the delivered price per million BTU's of gas, firm rate gas, in Dubuque? That is, delivered to your Dubuque generating station.

A Well, we purchase no firm gas, so I cannot give you the price of firm gas.

Q Can you give me the price of firm gas in Clinton, Iowa, at your Kapp station?

A Well, there again we purchase no firm gas for our Clinton station.

* * * *

[956] Q Is it not a fact that the proposal they made to you in order to bring gas into your station at Lansing was uneconomical?

A I believe that when we analyzed the proposal, it would not be economical for Interstate to make the expenditure to add oil burning facilities to our plant and buy at that particular price.

Q You also considered the possibility of oil burning facilities at Lansing?

A Excuse me. I meant gas burning facilities.

Q Have you considered the possibility of using oil burning facilities at Lansing?

A We have always discussed every alternate fuel and looked at it, and we are doing so more in recent years because of air pollution.

Q And this alternate fuel oil was also rejected at Lansing as being uneconomical?

A I don't recall that we went through to the final determination on oil.

Q Is your Fox Lake station presently burning oil with a sulphur content of approximately 3 percent?

A Again I would have to say that I am not that familiar with the sulphur content of every oil that we purchased, but we are burning oil in our Fox Lake plant from time to time.

* * * *

[959] Q Now, you were asked on direct examination several questions about the Pathfinder Nuclear Plant. Do you know at the present time what fuel that plant is burning?

A Yes, sir. The present Pathfinder Plant, of course, has been discontinued as a nuclear reactor plant because it was not feasible, and it has been phased out with the approval of the Atomic Energy Commission, and the owner of the power plant, Northern States Power Company, has installed oil-burning steam generators to

take care of their steam requirements at this particular power plant.

Q I take it, then, that Interstate Power is no longer a participant in this experiment?

A That is correct. Our participation discontinued at the time the research and development came to an end.

Q Because of your experience with the Pathfinder Plant, you attempt, do you not, to keep yourself aware of the developments in the nuclear field?

A The answer is yes, and since that time of our discontinuance with the Pathfinder Plant, the Interstate Power Company has entered into a study with several other [960] utilities in the Midwest area with the consulting firm of Black & Veech from Kansas City to study the feasibility of a molten salt reactor.

Q Has any conclusion been reached with respect to the feasibility of that reactor at the present time?

A No, sir. At the present time they are just concluding phase 1 of the study and are preparing to enter into the phase 2 area.

Q Could Interstate Power Company alone consider building a nuclear plant, given its present size and kilowatt capacity?

A Well, when you say could we consider, certainly we could consider many alternatives for adding to our generation.

You have referred to our size. I think we have a capability as of last December in our system of some 590 megawatts. Our peak last summer was in the neighborhood of 411 megawatts. So, we have some reserve. Our next unit, as we forecasted in the five-year forecast, will probably be other than base loaded plants because of the situation of our particular system, but certainly in the years ahead when we envision the possibility of putting in another base loaded plant, we feel that we would have adequate size to finance and construct and operate a nuclear power plant.

[961] Q Do you have an opinion, Mr. Steele, with respect to how large in kilowatt capacity a nuclear plant would have to be in order to be competitive in any part of the system you serve?

A Are you talking as of today?

Q As of today.

A As of today, of course, conditions have changed very rapidly with the cost of nuclear power plants, and like everything else, all power plant costs have gone up. At the present time, with the high cost of money, the fact that nuclear power in its total cost, because of the high fixed charges involved and the fact that we are situated on the Mississippi River with power plants that are available to reach the more economical coal fields in Illinois, I doubt that we could justify at the present time building a nuclear power plant.

Q Thank you, Mr. Steele.

At some point in the future, Mr. Steele, how large a plant would you have to build in order to compete economically with any other fuel in any part of your generating area?

A Well, that question is a little difficult to answer because the factors all change, and at the [962] present time a nuclear power plant in our particular area has been described by certain more technical experts than myself that you would perhaps have to build an 800 megawatt unit to reach the economical points.

Now, as to the future, whether the conditions will remain the same, the cost of money, various factors that are involved in the total over-all concept, I wouldn't be able to answer a positive statement.

Q Mr. Steele, has your company made studies or projections of the peak kilowatt demand which Interstate Power Company will face over the next 10 years?

A I don't think we've gone 10 years, but we do forecast 5, 6 and 7 years in advance and, of course, we are updating these each time we reach a new peak, and the answer is yes, we have forecast what our requirements would be for a number of years ahead.

Q With respect to your projection of five or six years hence, do you project that your peak load will have reached 1200 megawatts by that time?

A No, sir, not in that period of time. As you know, the electric utility industry has had a past performance of doubling about every ten years, and this has been true with Interstate, so if we are at 600 or [963] close to

600 megawatts of capability, it will be perhaps ten years into the future before we would reach the 1200 megawatt figure that you have just mentioned.

Q In the meantime, Mr. Steele, is it true that you will rely on coal to generate a good portion of your electric generating requirements?

A Well, I would say that we would certainly rely to a great extent on coal for our power plants, based again on the competitiveness of the fuel, and in comparison with the studies that we make as versus the cost of gas and oil, and we are always studying the possibility of buying or owning jointly power plants with our neighbors whom we are interconnected with.

Q Mr. Steele, has Northern States Power Company—

MR. BRAUN: I will withdraw that, your Honor.

BY MR. BRAUN:

Q Mr. Steele, did you last renegotiate your coal contracts in 1966?

A I believe it was 1965, 1966 period.

Q How many different companies, coal companies, did you contact with respect to that renegotiation?

A Oh, we contacted a number. As to the exact number, I can't recall, but I know that we contacted [964] at least five or six companies and visited with them.

* * * *

[969] Q You decided then to add a fourth supplier sometime between 1965 and 1966?

A Yes, sir, we did, and I might say that primarily it was based upon our concern for the reserves that United Electric were indicating to us.

Q Did United Electric make their back-up reserves of Freeman available to you?

A I can't recall that this was ever stipulated.

Q So that there was no willingness that you know of on the part of United Electric to make Freeman's reserves available as a back-up?

MR. KEMPF: Your Honor, I am going to object. That is the same question he just asked and the witness just answered.

THE COURT: He may answer. Let's proceed.

BY THE WITNESS:

A Repeat the question, please.

THE COURT: Read the question.

(Question was read by the reporter.)

BY THE WITNESS:

A Is that the question you wish answered?

BY MR. BRAUN:

Q Yes, sir.

A I don't recall that this was a part of it. It may have been. As I say, some of the conversations [970] that they conducted with Mr. Carlson were, of course, never fully related to me.

• • • •

[984] Q Prior to 1965 would Interstate Power Company have purchased coal on its lowest delivered BTU basis?

A We always have tried to purchase coal on the lowest delivered possible basis consistent with deliverability and facilities that we have to handle it. There are many factors involved, not just straight price.

Q Prior to 1965, Mr. Steele, has the Interstate Power Company ever purchased coal from the Freeman Coal Mining Corporation?

A I can't recall that we did, but this is a period of time, and my memory may fail me. I know that these people have called on us in the times past. I think you asked that question when you were in my office, and we researched it, and I think we showed you some cards from the Freeman Coal Company salesmen who stopped in our office.

Q Did you not also inform me at that time that you had indeed purchased from Freeman Coal Mining Corporation?

A We may have purchased some small tonnage, but not anything larger or of consequence to our total requirements.

• • • •

[987] BY MR. BRAUN:

Q And the additional statement at page 205, where Mr. Hedlund asked Mr. Morris on direct:

> "Q Would you tell us what responsibilities after 1959 in your role as president you had with respect to the contracts of United Electric Coal Companies?
>
> "A Reports were made to me on all of the activities of our sales department as to what they were doing, and where, and I still had over-all supervision over sales as president, and the vice president of sales reported to me and kept me informed as to what was going on after I became president. I personally took part in discussions with some of our major customers, [988] particularly Union Electric, Northern States Power, Interstate Power and Central Illinois Light."

Were you aware of that testimony when you answered that question with respect to adverse effect on your company, when Mr. Kempf put that question to you on direct?

A No, sir, I have not seen any of the testimony in this particular case.

Q If Mr. Morris, in discussing the contract prices with the Freeman Coal Mining Corporation—if this resulted in an increased price, assuming that it resulted in an increased price to Interstate Power Company, would this have an adverse effect upon Interstate Power Company?

A Well, any increase in price from any of our suppliers would cause us to reanalyze our entire situation and our purchase requirements. As to the amounts of the increase, what the outcome would be would be difficult to speculate on.

Q Does Interstate Power Company consider that price competition is of benefit to it?

A Well, I would say that all competition as it affects the prices of the various fuels would be [989] beneficial if it has a tendency to lower the delivered cost of the fuel to us, no matter what the fuel is.

Q Does Interstate Power Company believe that a discussion of prices between two of its suppliers is likely to be of benefit to Interstate Power Company?

A I am sorry, but I don't think I have the ability to answer that question. It calls for speculation on my part.

• • • •

[993] Q Are you at all concerned, Mr. Steele, about [994] the extent of the total coal reserves, that is, mineable coal reserves, available to Interstate Power Company in Illinois? Are you at all concerned about running out of those reserves?

A Well, I am sure that we are concerned about mineable reserves, and the best information I have is that there are a lot of reserves still available for mining. What the economic factors will be at the time these reserves are opened up, I don't know. But certainly we are concerned about reserves. But we are looking more to the West for coal as well as to Illinois, primarily because of air pollution.

Q Mr. Steele, would it be more economical to use pollution control equipment on your Mississippi plants as opposed to bringing in coal from the West?

A Well, at the present time we have a very expensive electronic precipitator on our new plant at Clinton, Iowa, which we installed and made the commitment for years before air pollution became a headline item. Prior to that we had made an expenditure as a company for mechanical precipitators at our Dubuque Plant. So we already have expended money to control air pollution. We have quite an air pollution control program within our company. The burning of additional gas as we can [995] obtain it is a part of this.

• • • •

[996] Q Would that be more true if some of the reserves were located in the Belleville district?

A I would have to agree that if this was in the Belleville district and we were depending on this particular coal company and were buying coal at the particular time and our long-term requirements were such

that it would mean we would have to develop additional reserves, why, yes.

Q Did you come here today under subpoena, Mr. Steele?

A No, sir.

Q You came here voluntarily?

A That is right.

MR. BRAUN: I have no further questions.

MR. CUSACK: Excuse me, your Honor. May I confer with Mr. Braun?

THE COURT: You may. Let's proceed.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Just three more questions, your Honor.

THE COURT: All right.

BY MR. BRAUN:

Q Mr. Steele, what information do you have with [997] respect to the coal reserves of United Electric?

A I don't have any specific tonnage at the present time, but I know that in our analysis of our coal requirements and in our discussions with United Electric personnel and in our meetings with other companies and with other electric utility companies, in talking to their personnel, we formed a judgment that there was a reserve problem, and back at the time that we were negotiating these new contracts, we so talked to United Electric about this particular problem.

Q So is it fair to say, Mr. Steele, that a good deal of your source of information about United Electric's reserve situation comes, in fact, from United Electric?

A I can't tell you just what it is percentagewise, but it is a matter of numerous discussions with a number of people, and as to what the percentage was, I would be unable to give you a qualified amount.

Q And is it fair to say, Mr. Steele, that you did not learn from the number of people to whom you talked about the existence of United Electric's deep coal reserves and Round Prairie Field or Beaucoup Field?

A As I said before, in my discussion here today in response to your questions, this may have been covered [998] with some of our personnel, but not with me.

• • • •

REDIRECT EXAMINATION

BY MR. KEMPF:

• • • •

Q You also discussed the fact that you were a member of a pool and were interconnected with other companies.

Were the decision made to install a nuclear facility within your system, would it be your expectation that a portion of the generation of that facility and in particular that portion which exceeded your own demand would be sold to your interconnecting pool members?

[999] A It could be handled that way, either sold on a firm basis for a period of years, or there are presently plants being built in joint ownership where each participant owns a portion of the unit.

Q Questions were asked of you concerning the Freeman and United Electric affiliation. When and how did you learn of this affiliation?

A As I recall, we were visited by United Electric people maybe 10 years ago and advised of what was taking place with United Electric.

[1000] Q This is in regard to its affiliation with Freeman?

A Yes.

Q You were asked whether it made any difference to you whether coal came from deep mines or strip mines from the Belleville District. My question is assuming that United Electric were not affiliated with Freeman and did not have the access to Freeman's deep mining technology and experience; under that assumption, suppose that United Electric were to come in to you as a utility executive and offer to sell you coal from a deep mine, notwithstanding the fact that they have no deep mine experience, what would your reaction be?

A Well, as I have testified, we always have felt or thought of United Electric as a strip mine company, not having any prior experience with deep mining, I would say that we would be hesitant about entering any commitment for coal from an unknown source, so to speak.

Q Your Savanna Station, which you discussed, is that operated at the present time?

A No, sir. This is retired in November of last year.

Q Would it be possible to truck coal into your [1001] Clinton Station from the mines that used to serve the Savanna facility?

A Yes. It would be possible to truck it, but the quantities that we require, the tonnages in this particular plant, far outstrip the ability to transport coal by truck economically.

Q During your period of acquaintanceship with the company's coal buying, have you ever experienced any price increases from The United Electric Coal Companies that would give any indication that there was improper conduct in terms of the relationship between that company and Freeman Coal Mining Corporation?

A No, sir. We have always dealt with United Electric and our other coal suppliers, I would say, and we have attempted to bring the price together if there was any variance at all.

Q Do you consider your Mississippi River facilities to be in the natural area to be served by mines in the Belleville District?

A Yes, I do, because of the close haul or short haul from the mines to the docks on the Mississippi and the fact that it can be barged up the river.

Q You indicated during your cross examination that you are a distributor of both gas and electricity. [1002] Do employees of Interstate Power Company actively attempt to convert industrial and home consumers of coal who are consuming only coal at their facilities to the use of natural gas instead of coal?

A Yes, sir. We have engineers who are actively seeking out the possibility of converting customers from other fuels to our gas supply.

1003] Q To the extent they are successful, the facilities in question consume less coal than they formerly did, is that correct?

A Yes. If they converted to gas.

Q Do you have any major customers who have made such conversions?

A Yes, we have. We have one of our ten largest customers, the Northwestern Portland Cement Company, at Mason City, that has phased out its own generation and the purchase of coal and is now taking its electrical requirements all from us rather than generating its requirements.

Q Did you indicate the name of the company?

A Northwestern States Cement.

Q You mentioned the possibility of burning more western coal in the future. What is the sulphur content of western coal? Is that low sulphur or high sulphur coal?

A It is lower than the coals we are purchasing at the present time, and I believe these coals are in the neighborhood of 1.5 percent sulphur.

Q Have you actually undertaken to begin investigation of this?

A Oh, yes, we have discussed this a number of times with companies.

* * * *

AFTERNOON SESSION—3:15 P.M.

* * * *

[1010] THE COURT: Are you ready to proceed?

MR. HEDLUND: Yes, your Honor.

THE COURT: Are there any matters to take up with the Court?

MR. HEDLUND: May we be off the record, please?

THE COURT: We may.

(Discussion held off the record.)

THE COURT: Back on the record.

MR. IRVING: The defendants at this time will call Mr. Thomas Latimer to the stand.

(Witness duly sworn.)

THOMAS H. LATIMER,

called as a witness by the defendants, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. IRVING:

Q For the record, would you please state your full name.
A Thomas H. Latimer.
Q Mr. Latimer, what is your current home address?
A 111 West Prairie Avenue, Wheaton, Illinois.
Q By whom are you employed, sir?
A The United Electric Coal Companies.
[1011] Q What is your business address?
A 307 North Michigan, Chicago.
Q What is your current position with UEC?
A Manager of Lands.

MR. IRVING: I ask the reporter to mark for identification as Defendants' Exhibit 60-D a four-page document entitled "United Electric Coal Companies—Possible Reserve Acquisitions at Existing Mines," and I hand it to the witness.

(The said document was marked Defendants' Exhibit 60-D for identification.)

[1012] BY MR. IRVING:

Q Mr. Latimer, do you recognize this document?
A Yes.
Q Have I correctly described it?
A Yes.
Q Were the figures and information set forth in DX-60-D compiled and prepared by you, sir?
A Yes.
Q Mr. Latimer, what does this exhibit purport to show?
A It shows the remaining reserves and the potential acquisitions of reserves at our operating mines and the North Canton Field, which was combined with the Buckheart Mine.

Q Mr. Latimer, what procedure did you use in compiling the information set forth in this exhibit?

A Personal knowledge of the fields; the result of our drill records; investigation of old mine maps, geological reports, and so forth; drilling that has been done in the last year; drilling off these properties that have been mentioned.

Q What expertise or special knowledge do you have which qualified you to prepare this exhibit, sir?

A Well, I have been investigating coal —— [1013] for a great many years, I believe since about 1939. I have investigated coal fields in, I believe, 12 states, and one province in Canada. I am thoroughly familiar with all of these properties of ours. I am minutely familiar with them, their ownership, the coal information available on them, and I think about everything there is know about them.

[1014] Q What first-hand knowledge, if any, have you had with respect to the facts set forth in this exhibit?

A I have quite complete first-hand knowledge of all of them.

Q Sir, what sources have you consulted in evaluating these properties?

A The sources that I mentioned, geological surveys, the mine maps, personal observation, outcrops results of our drill records on adjoining properties and nearby.

Q Sir, by "personal observation," does that include a physical examination of the tracts mentioned?

A Yes.

Q Pardon me?

A Yes.

Q Mr. Latimer, in what sense have you used the word "possible" in these charts?

A I believe they are available for sale to us and they, I know, contain some coal.

MR. IRVING: Your Honor, at this time defendants have no further questions.

THE COURT: All right. Are you offering the document?

MR. IRVING: Yes, we would at this time offer 60-D into evidence.

* * * *

[1016] CROSS EXAMINATION

BY MR. SIMS:

* * * *

[1017] Q Mr. Latimer, do you recall making an estimate of the coal owned or available to UEC at their Banner Mine around 1956 to 1957?

A I don't think I remember preparing one at that time. I may very well have.

MR. SIMS: Your Honor, may I approach the witness?

THE COURT: You may.

MR. SIMS: Would the Reporter mark as Government Exhibit GX-119 the document entitled "Estimates for Proposed Acquisition and Operation of the Banner Property", dated January 10, 1957.

(The document was thereupon marked as Government Exhibit No. GX-119 for identification.)

BY MR. SIMS:

Q Mr. Latimer, I hand you what has been marked GX-119. Would you refer to the third page of this document entitled "Introduction", the second paragraph, which reads:

(Reading.) "The reserves owned and available on the Banner property according to Mr. T. H. Latimer's estimate are as follows:

[1018] "Owned or controlled by United, 3,180,000 tons; available on adjacent lands, 3,320,000 tons; to be acquired from Kingston River Terminal, 1,300,000 tons. Estimated total, 7,800,000 tons."

Mr. Latimer, does this refresh your recollection of any estimates you made?

A Excuse me, sir. I've lost it. I thought you said page 3.

Q The page really is not numbered. Sheet 3.

A Sheet 3?

[1019] Q Under the introduction of the second paragraph.

A I did not write this report.

Q Well, it does refresh your recollection as to the estimate, does it?

A That estimate is probably undoubtedly made by me.

Q Do you have any idea approximately how many tons of coal had been mined at the Banner mine to date?

A I would have to refer to the record.

MR. IRVING: That is a matter of record in this case, your Honor. The production figures for these mines is in evidence, and they would be the best record of this sort of information.

THE COURT: Is this a foundation question?

MR. SIMS: Yes, your Honor.

THE COURT: It is a foundation question. He may answer.

BY MR. SIMS:

Q Do you have an estimate of approximately the tonnage mined at the Banner mine to date?

A I think I would have to refer to the record.

* * * *

[1032] BY MR. SIMS:

Q I think you testified in your deposition, Mr. Latimer, that you were not sure what drill holes had been placed in this property but that the overburden was too high at the time and UEC dropped this property or the options in this property, is this correct?

A I can't remember all of the drill holes, but the overburden was not only too high, but there were other troubles with it, too.

Q Pardon?

A There were other troubles with the field.

Q What were the other problems with the field?

A One problem was that the rock overburden was so high it would be impossible to work a wheel excavator in there. The average overburden was nearly a hundred feet. We found that the mine, although there were no maps to show it, the center of the hill had been mined completely through from crop to crop, and there was probably less than 3 million tons in the field.

[1033] Q You stated during your deposition, Mr. Latimer, that you were not real sure how many tons were remaining in the field. Have you done any work in that area since the time of the deposition that was in December, 1968?

A In the King Hill area?

Q Yes, sir.

A An estimate could be easily prepared in our office.

Q Approximately how many drill holes did you put down in the area?

A I don't remember.

Q Are you in a position at the present time, Mr. Latimer, to say that this area will not be mined by UEC economically in five years?

A In five years?

Q Yes.

A I don't see how it could be.

Q Of course, you would not know what economic conditions would prevail in the coal industry in five years, would you?

A We have no equipment in the vicinity capable of mining it.

Q You, of course, can, however, purchase equip-
[1034] ment that will mine a hundred feet of overburden, can you not?

A Not to mine three million tons, or less.

Q If you had other tonnage available to you, Mr. Latimer, would you consider in five years mining this property?

A That's a matter of conjecture.

MR. SIMS: Would the reporter mark as Government Exhibit 122 a document from R. H. Inman to R. J. Hepburn entitled "No. 2 Coal South of Illinois River" dated August 5, 1959.

(The document was thereupon marked as Government's Exhibit 122 for identification.)

THE COURT: Do you have a copy of that for the Court, Mr. Sims?

MR. SIMS: Yes.

• • • •

[1041] BY MR. SIMS:

Q Would you also draw on that map the approximate location of UEC's Gayle Field?

A (Drawing)

Q Are you finished?

A Yes.

Q Approximately how far is the Gayle Field from the Fidelity mine?

A From which part of the Fidelity mine?

Q The closest point to the Gayle Field?

A Oh, perhaps two miles.

Q Do you know at the present time that the Gayle Field will not be mined when the Fidelity reserves are exhausted?

A No, I do not know.

Q Is it your belief that it will be mined?

A I think it a little doubtful.

Q Approximately how many reserves are estimated in this field?

A I will have to refer to the record.

Q You have no approximate estimate?

A No, I don't remember.

MR. IRVING: Your Honor, I might point out this information is in the record in the case.

[1042] THE COURT: Mr. Sims, if it is a matter of record, there is no reason you can't ask a leading question: "Is there approximately so many tons?"

BY MR. SIMS:

Q Mr. Latimer, is there approximately 1,000,500 tons of coal in the Gayle Fields?

A Whatever the record shows.

THE COURT: The reporter would like to know whether you meant what you said. I have that you said 1,000,500 tons. Is it 1,000,500 tons or 1,500,000 tons?

MR. SIMS: 1,500,000 tons.

Would the reporter mark for identification Government's Exhibit 124, please. This is a letter from T. H. Latimer to George Heap, which was identified in Mr. Latimer's deposition as Latimer Deposition Exhibit 30.

(The document was thereupon marked as Government's Exhibit 124 for identification.)

BY MR. SIMS:

Q Mr. Latimer, would you look at this document?

MR. IRVING: Your Honor, may I please have a more accurate description of the document? I was not able to hear Mr. Sims.

THE COURT: Read the description.

(Record read by the reporter.)

• • • •

[1066]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before the HON. EDWIN A. ROBSON, Judge,

Wednesday, April 8, 1970,

10:30 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES FOLSOM

• • • •

[1070] E. C. HILL,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you would please state your name and present occupation?

A My name is E. C. Hill. I'm presently president of HILCO, Corporation. It's a coal brokerage firm with offices in Chattanooga, Tennessee.

Q Are you a resident of Chattanooga, Tennessee?

A Yes, I am.

Q Mr. Hill, were you formerly employed by the Tennessee Valley Authority?

A Yes, sir, I was.

Q Beginning in what year?

A I joined TVA in 1951.

Q Approximately how long were you with TVA?

A A little over 17½ years.

Q Would you please briefly describe the positions that you held with TVA and your responsibilities during [1071] the course of that 17 years.

A When I joined TVA in 1951 I was employed as a general buyer, buying primarily fuels, lubricants, fuels such as gasoline, diesel fuel, oils, greases, welding equipment, supplies and that nature, and after about eight months of employment I moved into the field of coal buying for TVA. I was a general buyer for them in the beginning. The latter part of 1951 I moved up to additional responsible jobs in the coal buying end of it, and in 1954 I was made assistant chief of the coal procurement branch. In 1956, I was made chief of the coal procurement branch. I held that position until 1966, when we took on nuclear fuel buying, and the position's title was changed to fuels procurement, which included coal and nuclear fuel.

Q Mr. Hill, the Tennessee Valley Authority is an instrumentality of the Federal Government, is that correct?

A Yes, it is.

Q It is not an investor-owned utility?

A No.

Q Mr. Hill, I direct your attention to what has been received in evidence as Defendants' Exhibit 144, which is a map of industrial-owned electric utility [1072] service areas, and I wonder if you could indicate on the map generally the geographic confines of the services areas of TVA?

THE COURT: You may step down, if you desire.

THE WITNESS: Yes.

MR. HEDLUND: Your Honor, I am not sure you have a copy of the map. Here is one.

THE COURT: I can recall it. Give me the number of the district. I looked at it—

MR. HEDLUND: It is not numbered, your Honor.

THE COURT: Oh, it is not numbered. All right.

MR. HEDLUND: Well, I will ask the witness to describe it.

BY THE WITNESS:

A This area which encompasses the State of Tennessee is the base operating area of TVA. TVA does cover certain segments of Kentucky, down into Alabama, certain segments of Mississippi, over into Georgia, North Carolina and Virginia.

[1073] BY MR. HEDLUND:

Q Generally is its service area within this blank white area in the states that you mentioned?

A Yes, it is.

THE COURT: May I inquire, does it extend over into Missouri, that white area?

THE WITNESS: No, sir, it does not go that far.

THE COURT: It does not. All right.

BY MR. HEDLUND:

Q Mr. Hill, would you please describe briefly the generating, electrical generating facilities and plants of TVA.

A Well, TVA is a government agency created in 1933 by an act of the Congress of the United States. It initially was primarily a hydrogenerating entity. Well, it was created to develop the Tennessee River, to eliminate floods, create navigation on the Tennessee River, and to also provide power to the area in which it was located. Initially it was made up primarily of hydrogenerating facilities, but as the load growth increased, hydro capacity was not adequate to fill the needs, so TVA went more into the field of steam generation, and in the early 50's, late 40's, TVA made a [1074] rather substantial move in the steam generating field and built a large number of coal-fired steam electric plants.

Q Could you tell me at the time that you left TVA the numbers and types of generating stations which it had on line at that time. Let me start first by asking how many hydroelectric generating facilities TVA had in approximately 1968.

A TVA had approximately 40 hydrogenerating facilities at that stage. It had 10, as I recall, coal-fired steam electric plants.

Q Stopping for a moment on the coal-fired plants, could you briefly describe the location and the size of the principal coal-fired generating stations of TVA.

A The coal-fired stations represent about 14,000,000 kilowatts capacity in the TVA system, with hydro capacity amounting to about 4,000,000 kw. The coal-fired plants are built—two plants are located in the West Kentucky coal field. Others are located in Tennessee and Alabama.

Q What are the names of the two principal facilities located in the West Kentucky coal field?

A The Shawnee plant located near Paducah, [1075] Kentucky, is a 10-unit facility, each with a rating of 150,000 kw. The other plant, the Paradise plant, is located near Central City, Kentucky. It presently has three generating units. Two of them are rated at 715,000 kilowatts each. The third, which has only recently been placed on line, is a 1150 megawatt, or 1,150,000 kw. unit.

Q As of 1968 did TVA have either an order or under construction or in planning any nuclear fuel generating units?

A Yes, it did. TVA entered the nuclear power generating field in the fall of 1966. At that time we placed orders for two boiling water reactors to be built by General Electric Company and we added a third unit boiling water reactor from GE to the plant. This plant, the first nuclear plant, is known as the Brown's Ferry plant near Decatur, Alabama. These three units are rated at about 1100 megawatts each, and then in the—

Q Excuse me for interrupting. That would then be at Brown's Ferry a total of 3300 megawatts of generating capability?

A Approximately, that is correct.

Then the second plant, nuclear plant, which TVA has on order is named the Sequoia plant, which is [1076] just north of Chattanooga, Tennessee. It consists of, or will consist of, two units that will be supplied by Westinghouse Electric Company, their pressurized water reactors. The ratings on these units are approximately 1150 megawatts each. This plant is not yet under construction. Contracts were made while I was still with the TVA for the supply of the equipment and the initial fuel supply, but AEC has not yet granted a construction permit for that plant.

[1077] Q When the Sequoia Plant is finished, and you mentioned that there is another coal-fired plant under construction by TVA, can you give me some idea of the breakdown between coal and nuclear in terms of the percentage of generating capacity that will be coal and the percentage that will be nuclear?

A TVA presently has about 15 million. There has been an addition to the TVA system coal-fired units since I left in August of 1968. They added this third unit at Paradise which is a 1,150 megawatt unit. So, roughly, they have 15 million kilowatts capacity in coal-fired units at this stage.

They have also since I left entered into a contract—well, I will back up.

We made this contract for an additional coal-fired plant while I was still with TVA. This was for two 1,300-megawatt units to be located at a site about 50 miles west of Nashville, Tennessee, on the Cumberland

River. The plant will be called the Cumberland Plant. These two units will add 2,600 megawatts of additional capacity, making about 17,500 megawatts of coal-fired capacity and about 5,600 megawatts of nuclear capacity.

Q I believe you mentioned it before, but what [1078] will the total capacity be with respect to hydroelectric?

A About 4 million. There is little likelihood of much addition of hydro capacity except for a peaking plant that TVA has recently announced. They announced a Rocky Mountain Plant, they call it, which is going to be a pump storage facility. It will have a capacity, as I recall, of about 1,400 megawatts. It will add to the present hydro system or is a more or less conventional hydro system. This will be the first entry into the pump storage type facility for TVA.

MR. HEDLUND: May I approach the witness, your Honor?

THE COURT: You may.

BY MR. HEDLUND:

Q Mr. Hill, I hand you what has been received in evidence as Defendants' Exhibit 103 which is a document entitled "Comparison of Coal-Fired and Nuclear-Powered Plants for the TVA System" which carries a date on the second page of June 1966.

Can you tell me briefly the circumstances under which this was prepared or why it was prepared?

A This report was prepared because of TVA's entry into the nuclear-powered generating field. It was a new field for TVA.

[1079] Because of the size of the units that TVA was contracting for, nuclear units, we felt that the nation as a whole needed some explanation for this particular move on the part of TVA. So, this report was prepared by a number of people in TVA with this primary objective in mind, to give a good explanation for the TVA supply area as well as the nation as a whole for TVA going into the nuclear power generating field.

Q I direct your attention, sir, to page 15 of that document.

A Yes.

Q Under "Conclusions," the first sentence reads as follows:

> "It is evident from the results of the evaluation that the nuclear alternatives have a decided advantage over the coal-fired plant, and that either a BWR or a PWR nuclear plant at Brown's Ferry would be a decided economic choice over a coal-fired plant at Cumberland City."

Do you know, Mr. Hill, whether at the time this was prepared that that was a true and accurate statement?
[1080] A That was a true and accurate statement at the time that this was prepared.

Q There is, is there not, coal mining in substantial sections of the state of Kentucky and of Tennessee?

A Yes, there is. In west Kentucky as well as east Kentucky, coal is produced. Coal is produced in east Tennessee. There is no coal produced in west Tennessee.

Q Is there coal presently being produced, if you know, in the state of Alabama?

A Yes, there is.

MR. HEDLUND: May I approach the witness, your Honor?

THE COURT: Yes.

BY MR. HEDLUND:

Q Mr. Hill, I hand you what has been received in evidence as Defendants' Exhibit 116 which is a document published by the United States Atomic Energy Commission, Division of Technical Information, and it is entitled "Nuclear Power Briefing for the Coal Industry, September 29-30, 1966, Oak Ridge, Tennessee."

Mr. Hill, did TVA participate in this nuclear power briefing?

[1081] A One of TVA's officials did appear on the program in this briefing, yes.

Q Were you present at this briefing?

A Yes, I was.

Q I would like to direct your attention, if I may, to page 192 of this document where the following is stated in part, beginning in the middle of the page.

By the way, just for the record, this page 192 is part, is it not, of a presentation made by G. O. Wessenauer, Manager of Power of the Tennessee Valley Authority, is that correct?

A That is correct.

Q Returning to page 192, the following is stated:

> "Today nuclear power offers an alternative to coal-fired thermal plants and portends to be an even stronger competitor for meeting future needs. We expect that coal will leave no economic stone unturned in meeting that challenge. TVA will continue as in the past to evaluate and to compare before deciding on future plants. With those of you who produce coal and those who transport it, TVA has a mutual interest. It is to keep the delivered cost of coal competitive."

[1082] Sir, I ask you whether you agree or disagree with the statements that I have just read?

A Yes, I agree with the statement that was made by Mr. Wessenauer.

[1083] Q Mr. Hill, in your opinion, does coal compete with nuclear energy, gas, oil and hydroelectric power for the energy business of TVA?

A Yes, it does.

Q Approximately how many tons of coal does TVA presently consume or did it burn in 1968, your last year with them?

A Slightly over 28 million tons in 1968.

Q How would that rank TVA in terms of coal-burning utilities across the country?

A Well, TVA is and has been for some time the largest coal-burning utility in the United States.

Q Are you aware of the affiliation of the Freeman Coal Mining Corporation and The United Electric Coal Companies?

A Yes, I am.

Q When did you first become aware of this?

A Well, the formal affiliation as I recall took place in the late 50's, about 1959, but there had been an affilia-

tion of sorts, according to the information that had come to me, even in years earlier than 1959.

Q What was that information?

A Well, I had bought coal in my position with TVA from both the Freeman Coal Mining Corporation and The [1084] United Electric Companies for several years. I had what I feel were good relations with the officers of those companies. We discussed their various activities on a number of occasions. I was informed by some of the officers of the company of the association between the two companies.

Q This was prior to 1959?

A Yes, that is correct.

Q In that time prior to 1960 which you have just referred to, did United Electric operate a mine in West Kentucky?

A Yes, they did, the Buffalo Creek Mine.

Q Do you recall also whether or not they had a sales agency relationship with another mine in west Kentucky?

A Yes, they did. They had a sales agency relation with a company, Ruby Chandler Jordan, as I recall.

Q Mr. Hill, I hand you what has been received in evidence as Defendants' Exhibit 104 which is a letter from you to Bart, dated October 17, 1962, and Defendants' Exhibit 105 which is a letter from Barton R. Gebhart, vice president of Freeman Coal Mining Corporation to you, dated October 18, 1962.

Initially, while Defendants' Exhibit 104 [1085] is just signed Elmer and it is addressed to Bart, I assume the Elmer is you and that the Bart is Barton Gebhart of Freeman, is that correct?

A That is correct.

[1086] Q Would you tell me, sir, the circumstances surrounding the exchange of this correspondence between yourself and Mr. Gebhart.

A This correspondence developed over a request by Mr. Gebhart to me to authorize Freeman Coal Mining Company to supply a portion of the requirements of this contract No. 401T3 that we had entered into with the Freeman Company, to supply a portion of it from the

United Electric Coal Companies mine, the Fidelity mine in Belleville, in the Belleville district of Illinois.

Q You state on Defendants' Exhibit 104, at the conclusion, "I feel that the contract is good for both of us and that we will certainly reap mutual benefits from it."

To what benefits as far as TVA was concerned were you referring?

A The primary benefits that I could visualize for TVA was this. I had been trying for some time to get greater participation from the Illinois coal field in TVA's market. TVA was becoming more and more dependent on the west Kentucky coal field for its coal supply. We were buying more than 30 percent of the total production from the west Kentucky field. It had reached a state of about 55 percent of total supply for [1087] the TVA system from that one field.

The Shawnee steam plant, which is located near Paducah, Kentucky, is relatively close to the southern Illinois coal field, some distance of 50 miles or so. I was seeking to supply that plant, and did for the time I was with TVA, with Illinois coal so that west Kentucky coals could be available for plants to the south of the producing field.

This move to authorize production from the Belleville field for the Shawnee market, I felt, was quite beneficial. It permitted TVA to enter into it on a volume basis for supply from an area from which it was not then receiving coal and had never received any significant amount of coal. So, for this reason, I felt this was a good move for TVA.

Q If you know, could United Electric have on its own competitively offered to supply coal to TVA at this time?

MR. SIMS: Your Honor, I object to this. This is highly speculative. He wouldn't have knowledge of what UEC could do.

THE COURT: Well, if he does, he may answer. I do not know whether he does or not.

BY THE WITNESS:

A The only way I can answer such a question as [1088] that is that the Belleville district from which the

United Electric coal or the Fidelity mine is located was not and had not participated in the TVA market. I assume it was because of economic factors. The quality of the coal from the Belleville district is somewhat inferior to the coal from the southern Illinois fields. So, for this reason, I would conclude that it is highly unlikely that they would have or could have competed with the other sources of coal for that Shawnee plant supply.

BY MR. HEDLUND:

Q What other sources are you referring to?

A The other sources are the west Kentucky coal field and the southern Illinois coal field.

Q Mr. Hill, in your opinion, and based on the facts that you have just stated, after the closing of United Electric's Buffalo Creek mine and the termination of the sales relationship with the Ruby mine, had they been independent of Freeman, would they have been able to compete with Freeman for the business of TVA?

A After the closing of the Buffalo Creek mine?

Q That is right.

A After the closing of their operations in the west Kentucky coal field, which moved them out of a [1089] normal source, a normal area of supply for us, I would question seriously that they could have competed.

Q Mr. Hill, do you recall the subpoena questionnaire that was sent to TVA in connection with this case?

A Yes. I think it came in connection with—as a subpoena. I recall some request for information from the Justice Department on this case, yes.

[1090] Q The reply to that subpoena indicates that in 1967 TVA purchased 34,000 tons of coal from Peabody's Mine No. 10 which the evidence shows is located in the Springfield Freight Rate District of the State of Illinois. Would you explain, sir, the circumstances under which that purchase was made?

A Yes. That was an unusual development. TVA had never bought any coal from what we classified as Central Illinois coal field, but just prior to the time this purchase was made, we had had several interruptions in production in the West Kentucky as well as Southern Illinois coal

field due to labor disputes. These were not industry-wide disputes, not national in scope, but were disputes that had interrupted production for intervals of a few days, a week, two weeks, and as a result of these interruptions the inventory at the Shawnee Plant had been reduced to a relatively low level. We had let the Shawnee Plant inventory drop more rapidly than we had other plants because we had the two fields from which we could draw coal. Plants such as the Johnsonville Plant or Gallatin Plant, which are both in West Tennessee were deriving their total supply from West Kentucky, so we let coal go on to those plants and two more on the inventory from the Shawnee Plant.

[1091] The inventory at the Shawnee Plant at the time that this purchase was made had dropped to a level of only about 115 or 120,000 tons, as I recall. There was a dispute in existence in the West Kentucky field at that time. In fact, the total West Kentucky field was out of production because of a labor dispute. It was a wildcat dispute, if I may term it as such.

It had been in effect for some ten days or so. We did not know how long it might last. Since the inventory at Shawnee was down to a level of ten days or so, we felt it was necessary for us to act under emergency conditions and seek to obtain additional coal from whatever source might be available. With my knowledge of sources of supply in the areas surrounding the TVA system, I concluded that the Peabody Mine No. 10 might be the best alternative.

Q Why was that, if you can recall?

A Well, it was and is one of the largest coal producing companies or mines in the United States. At that time I was buying from the Peabody Company out of West Kentucky about 5 million tons of coal a year. I had good relations with the officials of the Peabody Coal Company, I talked to the chairman, Mr. Merl Kelce, and I told him we needed some assistance, we needed [1092] help, we didn't know how long this dispute might last in West Kentucky, we couldn't afford for it to go on more than another week because it could interfere with the operation of the Shawnee Plant. I asked him if he could help me in providing

additional coal. He said he did have some stored coal at the No. 10 mine and that he could run the mine on a week-end for me if I was willing to pay the price. I told him we had to have the coal, and I asked him to be tolerant with the price. He agreed that he would ship me the coal at a price 25 cents a ton higher than the price he was receiving from his other customer.

[1093] Q Who was the principal customer of that mine at the time, if you recall?

A The principal customer was Commonwealth Edison Company.

I made the contract for the supply, based it with an open end, that they would ship me over a week-end some 30 to 40,000 tons of coal. The mine would be operated on a Saturday, and I didn't have a transportation rate at that time.

Q Do you recall with respect to this 34,000 tons of coal how many days it took you to get this shipment? I mean, was this something that went through the course of a month, or was it a shipment—

A No, it was a very short interval. It was shipped within a period of about four, five days, as I recall.

Q I notice from the reply to the questionnaire that the transportation on that coal was $2.50 a ton, just transportation.

A Yes.

Q That is just a little bit less, is it not, than the FOB mine price for coal which you were purchasing at that time from west Kentucky?

A I was buying some spot coal at that time at [1094] mine prices that were lower than the price, the transportation cost, on that partciular coal. This was considerably higher transportation rate than I was normally paying for coal from the Shawnee plant. Normal transportation rate was 85 cents a ton. I think I paid $2.50 a ton on this particular supply.

Q By the way, just to get a feel for the 34,000 tons of coal, approximately how many tons, just generally, of coal did that plant consume a year?

A Well, that plant has consumed between four and four and a half million tons a year since it was placed in full service along about 1954 or '55.

Q You say 4.5 to 5 million tons a year?

A No. 4 to 4.5 million tons a year. It was burning in the order of 12,000 to 12,500 tons a day, seven days a week.

Q Mr. Hill, in the five years immediately prior to your leaving TVA, other than the shipments from the Fidelity mine and the Belleville district and the 34,000 tons from Mine No. 10 in the Springfield district, did TVA consume any coal produced in the entire state of Indiana or in the Belleville-Springfield or Fulton-Peoria districts of Illinois?

A Not to my knowledge.

[1095] Q I believe, sir, you mentioned the new 1,300 megawatt coal-fired unit that is being constructed by TVA. Have I correctly described it?

A Yes. There are two units on order, 1,300 megawatts each, that are being placed at a site west of Nashville, Tennessee, on the Cumberland River.

Q If you know, has the coal supply for those units been obtained?

A Yes. The coal supply for some 15-year period has been arranged for. This has been done since I left TVA.

Q Do you know what the arrangements have been or what they are?

A Well, I know where the coal will come from and I know that the Peabody Coal Company will be the supplier.

Q Is this coal owned by Peabody?

A No. The coal will be mined from property that is owned by TVA. TVA acquired the property from General Services Administration. It's property that was previously the Camp Breckinridge property, Army property used during World War II.

Q Do you know whether that is deep coal or strip coal?

[1096] A This would be deep mined coal, yes.

Q How many tons a year would be produced out of that mine?

A Well, there will be two mines, as I understand it, each that are scheduled to produce 3.5 million tons annually.

[1097] Q So, this new facility will consume about 7 million tons a year?

A Yes, that is correct.

Q Mr. Hill, in your opinion has the common ownership, and before that the affiliation of Freeman and United Electric had any adverse effect upon TVA?

A Not in my opinion, no.

Q Has there been any benefit during that period?

A Well, I feel that the relationship, the common relationship between the two companies, is the primary reason that I was able to obtain the coal from the Belleville or Fidelity Mine of United Electric Coal Companies.

Q Mr. Hill, based upon your knowledge and experience and based upon the following assumptions, I then want to ask you whether in your opinion there would be any potential benefit to TVA that would follow from the divestiture of United Eletcric from Freeman.

The two assumptions that I wish you to make are that United Electric neither owns nor controls any coal reserves in the Southern Illinois Freight Rate District or in Indiana or in West Kentucky.

The second assumption I wish you to make is that at United Electric's existing mines all but [1098] approximately 4 to 5 million tons of reserves at those mines spread among the four have already been committed under long-term contracts.

With those two assumptions in mind, again based upon your knowledge and experience, can you see any potential benefit that might accrue to TVA that would follow from the divestiture of United Electric from Freeman?

A No, I see no disadvantage to TVA under the assumptions that you have described by virtue of the separation of the two companies. I see no advantage to TVA if the two companies are separated. That's the point I'm making.

Q Could you tell me why?

A Well, this is my conclusion in that respect, that if United Electric controls no coal in West Kentucky or Southern Illinois, which are the primary sources of supply for TVA at this time and have been for years past, that the reserves that United Electric may control elsewhere are inconsequential to TVA.

Q Speaking in terms of the numbers?

A Yes.

Also, if United Electric only has about 4 million tons of additional reserves that are uncommitted [1099] to

markets, this is not a significant amount of tonnage that would influence TVA's picture very much anyway. TVA is consuming more than 30 million tons a year at this stage.

Q In your opinion, Mr. Hill, at the time you left TVA would you describe the competition among your coal suppliers?

A At the time I left TVA competition was very strong.

MR. HEDLUND: I am sorry. I have one final question.

BY MR. HEDLUND:

Q During the last five or six years of your being with TVA, could you tell me what coal buying practices were followed with respect to long-term contracts or the so-called spot purchases?

A Well, the bulk of TVA's supply during the latter years I was with TVA was coming under long-term contracts. The spot supply was diminishing. This was brought about by the change in markets in part. Spot coal in the 50's was available in large quantities, primarily because of the production of resultant sizes from the mining or preparing of coal for more premium markets, domestic markets, we will say primarily.

Carbon, ordering sizes, screening, [1100] three-quarter's, inch and a quarter by zero, were available in large amounts and could be obtained on short-term purchases.

[1101] But, as the markets changed, as the domestic market dried up or diminished to a very low level, more and more of the full mine product had to be disposed of on the utility market, and to obtain assurance of supply, we went more to longer term contracts. The industry demanded longer term, coal industry demanded longer term contracts because of the capital investment involved in supplying a single product to a customer.

But, it was advantageous to TVA to have a longer term contract because it provided assurance of supply for operation of a tremendously and costly investment, which a coal-fired plant or steam electric plant involves.

Q Typically in those years, how long were these long term contracts? What was the duration of them?

A Most of the long term contracts that we made were in the order of 10 years. We did make a few that were as long as 15 years. The longest term contract that was made while I was with TVA was a 17-year contract for a mine-mouth plant.

MR. HEDLUND: Thank you, Mr. Hill. I have no further questions.

THE COURT: Are you ready to proceed, or would you like a short recess?

* * * *

[1103] CROSS EXAMINATION

* * * *

Q Who are you selling this coal to?

A It's primarily utility coal, going to Georgia Power Company, one of the utilities in the Carolinas, and some goes to TVA.

Q Are you making a profit for these companies?

A Yes.

Q Approximately what percentage of TVA's coal purchases when you were with TVA were bought under contracts of three years or longer?

A Well, at the time I left TVA, contracts of three years or longer were providing about 80 percent or more of the total supply.

Q Approximately what percent were under contract from six months to three years?

A 10 to 15 percent.

Q What percentage on the spot market?

A The balance, up to about 5 percent, was on the spot basis.

Q Why did you not purchase all your coal under long term contracts?

A Well, we didn't feel it was desirable to buy it all on long term contracts because of fluctuations in market for power generation. The shorter term contracts and spot purchases provided the opportunity to cut [1104] back on supply or buy more. We provided our base supply through the long term contracts, and the balance was used for the peaks and valleys of supply.

Q Your long term contracts did not provide that you could order more coal if you needed more or cut back some?

A They did provide, most of them provided, that we could cut back some, but as I recall none of them provided for us to increase the supply.

Q Did you find that you could purchase coal any cheaper buying on the spot market?

A Spot purchases generally were lower priced than were the longer term purchases.

Q Did you have any provisions in your long term contracts that would require the coal producer to give you a lower price if the price of coal in the area dropped?

A No. It would not require any supplier to reduce his price just because the price dropped in the area.

* * * *

[1106] Q Well, my question is, do you think TVA need not be concerned about the competitive situation among coal suppliers beyond southern Illinois and west Kentucky?

A Well, TVA is concerned about the competitive situation of coal suppliers in Tennessee, east Kentucky, Virginia, and so forth.

Q What about central Illinois?

A Well, since TVA has not bought coal from that area, I don't think it would have a primary interest in the competitiveness of that particular area.

Q Well, you did state on direct that this unusual situation, with this unusual situation, it went up to central Illinois to purchase some coal?

A That is correct.

Q In situations like this, does it benefit TVA to have a competitive situation in an area of this sort?

A In today's market or the market when I was with TVA, most coal is committed under some kind of contract at all times.

The situation that I described in connection with the No. 10 mine purchase I think is generally typical. There is no surplus of coal on short notice to my knowledge in any field.

Q Is it your opinion, Mr. Hill, at the present [1107] time that there is a shortage of coal in the TVA service area?

A Yes, I think there is a shortage of coal in the TVA supply area at this time.

Q Is it your opinion, Mr. Hill, that the coal companies have not responded adequately with sufficient supplies to meet demand and keep prices stable in this area?

A No, it is not my opinion that the coal companies have not responded properly. I think in my judgment that the developments with respect to the nuclear program in 1966, 1967, 1968, tended to discourage the coal industry from expansions in new mines, and that this lack of expansion which was due to concern about the future of the utility market for the coal industry—in my judgment, this is the primary reason at this stage for the shortage of coal supply.

Q Well, it was a fact then, though, that the coal producers did not produce adequate coal supplies to keep the prices stable. Is this not true?

A The coal industry does not have a surplus of production, that is correct.

Q The prices have been going up in the last two years, have they not?

[1108] A The prices have increased, yes.

Q When I talked to you on the phone, I think about a week ago, Mr. Hill, I think you said it was your personal opinion that one of the reasons for the reluctance of the Belleville mines to supply TVA's station was the fact that it had a better market in the St. Louis area. Is this not true?

A This is my opinion, yes.

Q If the St. Louis market contracts somewhat for coal suppliers in Belleville because of their pollution restrictions, isn't it likely that the Belleville district producers would begin bidding for TVA's coal contracts?

A I don't know because I don't know what is going to happen to TVA insofar as the pollution matters.

Q Mr. Hill, are you aware of any underground coal reserves owned by UEC in the Belleville district?

A No.

MR. HEDLUND: I am sorry, your Honor. May I have the question read back?

THE COURT: Would you read the question, please.

Q (Read by the Reporter.)

[1109] BY MR. SIMS:

Q Mr. Hill, do you have any way of knowing if UEC would have developed underground coal reserves in the Belleville district, assuming they have them, had they not been merged with Freeman?

A I have no way of knowing, no, what UEC might have done in that connection.

Q Do you have any way of knowing whether UEC would have offered these reserves to TVA?

A No.

Q You stated that UEC and Freeman coal was being shipped to TVA's Shawnee plant under a Freeman contract on direct.

A Yes.

Q Is both UEC and Freeman coal, or was both UEC and Freeman coal being burned in the same TVA boilers when this coal was shipped during the time you were with TVA?

A Yes. All that coal went to TVA's Shawnee steam plant.

Q Was there some difference in the quality between the UEC and the Freeman coal that you can recall?

A Yes, there was.

Q Were these differences simply translated [1110] into price?

A Yes. TVA's coal buying was based on the delivered heat cost of the fuel at the consuming plant. When Mr. Gebhart asked me to authorize the delivery of some of the Fidelity coal on the Freeman contract, he gave me quality information on the Fidelity coal. The quality was fully acceptable under TVA's specifications, but it was somewhat inferior to the coal that was supposed to be supplied by Freeman.

There was a price adjustment to bring the destination heat cost back to the same level. That adjustment as I recall was in the order of about 20 cents a ton.

Q When you were with TVA, there were a number of mines supplying the Shawnee plant, were there not?

A Yes, that is true.

Q Coals burned from these mines varied somewhat in quality, did they not?

A That is true.

Q In each case, you would simply translate the differences in the quality between the coal into delivered BTU price?

A That is the basis on which offers were evaluated in comparing bids for the Shawnee plant supply.

* * * *

[1113] Q Well, then, are you really in a position to say how competitive these coal companies were?

A I know that there was adequate coal supply offered each time that I went into the market to buy coal for the TVA plants.

Q This is the basis on which you conclude that it is a competitive situation?

A Well, I have general knowledge, or I had general knowledge, as to what it costs to mine coal. This was brought about by—

In fact, we had a staff of engineers. Each time we evaluated offers for supply to any of TVA's facilities, the reserves were checked, the equipment to be employed in supplying the coal was evaluated. With the engineering knowldge and know-how as to mining, it could be reasonably determined what the cost for production would be.

Q But the coal companies don't turn over to you their cost figures, do they?

A No, not normally.

Q You said you were mainly concerned with the supply of coal available to TVA, is this not true?

A When I was with TVA, I was interested in the available supply to our various plants. I was interested [1114] in the cost of that supply to TVA's plants.

* * * *

[1124] Q Is there any reason for an electric utility to have a mix in the size of the generating units that it has in operation within its system?

A Yes, there is a reason for having different size units.

[1125] Q Would you want all large size units in your system?

A No. It depends on the size of the system, however, because these units, regardless of whether they are coal-fired or may be nuclear units, they are not infallible; you do have failures.

If you have a large unit and it fails or its out of service for a period of time, it affects generation considerably more so than if it were a small unit.

MR. CUSACK: Your Honor, may I confer with Mr. Sims?

THE COURT: You may.

MR. CUSACK: Perhaps we can shorten this up a little.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Thank you very much, your Honor.

THE COURT: All right. You may proceed.

BY MR. SIMS:

Q Mr. Hill, in your opinion, is TVA heavily committed to burning coal in the future?

A Yes, they are.

Q In your opinion, is TVA very concerned about the competitive conditions among coal suppliers?

A I would think that they are concerned, yes.

* * * *

[1126] Q To the best of your recollection, what did they relate to you in these conversations concerning the affiliation between UEC and Freeman?

[1127] A Well, I was told by both the Freeman and the United Electric officials that Freeman or Material Service was acquiring stock in the United Electric Companies. I recognized that United Electric's reserves in the west Kentucky field where they had been separated

from or been a competitor, I will say, in our market, were being depleted. So, therefore, I had no concern about the affiliation because it appeared to me that there was no change in competitiveness of the companies for TVA's coal supply.

Q Do you know what coal UEC would have made available to TVA, say, subsequent to 1960 but for its affiliation with Freeman?

A No, I do not.

Q Defendants asked you, I think, before to make an assumption that UEC had no coal reserves in southern Illinois, Indiana or west Kentucky.

Is it your opinion that coal reserves of UEC in the Belleville district, which is right next to southern Illinois, would never become a competitive force in TVA's fuel requirements?

A All I can look to is the history. It was not a competitive force. I would have to assume that the history is the best guide that I have.

* * * *

[1131] Q If they had acquired coal in west Kentucky, also would they not have been a competitive force?

A The answer is the same.

Q Would it be the same if they had acquired coal in southern Indiana?

A No, the answer would not be the same on Indiana, because Indiana had never been a force in competition for TVA's coal supply.

Q Assume that because of the foregoing absence of competition between UEC and Freeman due to the association, UEC did not acquire reserves which it could sell to TVA. Would that not necessarily have had an anti-competitive effect on TVA?

MR. HEDLUND: I am sorry, your Honor. May I have the question, please.

THE COURT: Read the question.

(The question was read by the reporter.)

MR. HEDLUND: I am going to object to this hypothetical. There is no evidence in the record to support the assumption that Mr. Sims has asked the witness to make.

THE COURT: Where in the record is there anything [1132] to support this assumption?

MR. CUSACK: May I answer that?

THE COURT: No, he is conducting the examination. Either he knows or he does not.

MR. SIMS: There has been testimony, your Honor, that large sums of money were built up under UEC's current assets. I think we can argue and will argue that had not this money been built up within UEC's accounts that they would have, in fact, gone out and purchased, been more aggressive in purchasing, reserves in other sections of the country.

THE COURT: I do not know how we can assume that. The objection is sustained.

[1133] BY MR. SIMS:

Q Mr. Hill, didn't Thomas Tarzy, vice president in charge of sales of UEC, talk to you about selling TVA coal from the Fidelity Mine of UEC before UEC started selling coal to TVA under the Freeman contract?

A I had even tried to encourage Mr. Tarzy to sell me some coal from the Fidelity Field or Fidelity Mine because as I stated earlier I was seeking to obtain additional coal from Illinois to satisfy the total requirements of the Shawnee Plant. Unfortunately, I had not been successful in obtaining an offering of that coal prior to the arrangements made through the Freeman Company.

Q TVA did receive some coal from Truax-Traer's Burning Star Mine in the Belleville District at one time, did they not, Mr. Hill?

A Yes. As I recall, in the mid-50's or thereabouts some coal was bought from the Burning Star Mine of Truax-Traer, but it was resultant sizes, was bought primarily on a spot basis and at a very low cost.

Q Do you expect TVA's purchasing of coal to increase in the next five years?

A I would think so, yes.

Q What about in the next ten years?

[1134] A I think so.

Q TVA is not concerned about air pollution restrictions?

A I'm sure they are.

Q But, you do not think this will affect the amount of coal TVA burns in the future?

A I think it can affect the amount TVA burns in the future, yes, but I do feel that TVA will consume more and more coal during the next ten years.

MR. SIMS: May I have just a moment, your Honor?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Thank you, your Honor.

MR. SIMS: I have just two more questions, your Honor.

THE COURT: All right.

BY MR. SIMS:

Q Mr. Hill, approximately how much coal did TVA consume in 1950?

A In 1950?

Q Yes.

A Slightly less than a half million tons, as I [1135] recall.

Q Approximately how much did they consume in 1960?

A About 20 million, I would think.

Q In 1966?

A About 26 million.

Q What would you estimate TVA would consume in 1970?

A In 1970?

Q Yes, sir.

A About 33 million.

Q Would TVA have built a fossil plant rather than a nuclear plant if they had known that the Brown's Ferry unit would have been delayed as much as 12 months in your opinion?

MR. HEDLUND: May I have that question back, please?

THE COURT: Read the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A You mean built a fossil plant in lieu of the nuclear plant?

Q Yes, sir.

A I think they would have built a fossil plant, but I think they would also have built the nuclear plant.

* * * *

[1150] AFTERNOON SESSION

2:00 P.M.

* * * *

RICHARD DROLLINGER,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HAUBOLD:

Q Sir, would you please state your name and present home address.

A Yes. My name is Richard Drollinger. I reside at 18270 Lamplighter Lane, Brookfield, Wisconsin.

THE COURT: Will you spell your last name?

THE WITNESS: Yes, sir. D-r-o-l-l-i-n-g-e-r.

THE COURT: Thank you.

THE WITNESS: Yes, sir.

BY MR. HAUBOLD:

Q Mr. Drollinger, are you appearing here today pursuant to subpoena?

A Yes, I am.

Q Who is your present employer and what position do you hold?

A I'm presently employed by Harnischfeger Corporation, Milwaukee, Wisconsin. I am director of [1151] engineering for the construction mining division for that company.

Q Mr. Drollinger, would you briefly describe your educational background?

A Yes. I graduated from Ohio Northern University, Ada, Ohio, in 1949 with a Bachelor of Science degree in mechanical engineering.

Q How long have you held your present position, Mr. Drollinger?

A Since June of 1968.

Q Prior to June of 1968, by whom were you employed?

A I was employed by Marion Power Shovel Company, Marion, Ohio.

Q Is Marion Power Shovel Company engaged in the manufacturer of large stripping equipment utilized in coal mining operations in the Midwest?

A Yes, sir.

Q How many such companies are engaged in the manufacture of such equipment?

A There are only two companies, Mr. Haubold. Marion Power Shovel Company and Bucyrus-Erie at South Milwaukee.

Q Mr. Drollinger, do you know what the present dollar value of large stripping machinery currently [1152] employed in the Midwest is in terms of a comparison between Marion and Bucyrus-Erie?

A Would you rephrase that, Mr. Haubold, please, so that I can understand the question?

THE COURT: Will you read the question?

Q (Read by the Reporter.)

BY THE WITNESS:

A Yes. Marion and Bucyrus-Erie share equally in the market for large stripping excavators.

BY MR. HAUBOLD:

Q Mr. Drollinger, would you please state the positions that you held with Marion, and for each position could you briefly describe what your duties were?

A Yes, sir. I started as an engineering trainee with Marion Power Shovel after graduating from college, moved into manager of design for the intermediate machines. These are machines of two crawlers, mounted on two crawlers, excavators and draglines. I had the responsibility for the design of those particular machines for some period of time. I then moved into the position of manager of design for large stripping machines. This is both walking draglines and stripping shovels. I was then appointed manager of engineering, had the [1153] responsibility for the entire 140-man engineering department, and then was finally appointed, prior to my departure from Marion, as vice president of engineering with the same responsibilities as manager of engineering. [1154] Q Mr. Drollinger, when did you become Manager of Machinery Design at Marion, approximately, if you recall?

A Well, I left in mid-'68. About 1964, mid-1964, I had the responsibility for Manager of Design.

Q Now, Mr. Drollinger, during the period that you were Manager of Machinery Design and Vice President of Engineering, would you describe the frequency and nature of the contacts that you had at Marion with various coal mining companies engaged in strip mining in mid-western coal fields.

A Because of the specialized nature of the business, it was necessary that the engineering representative be present at all discussions pertaining to new machine proposals, machine modifications and this type of thing. So, I had intimate contact during that period of time with all of the major coal concerns where these discussions came into being.

Q Could you describe how frequently these discussions took place?

A Well, you understand, of course, that Marion was not successful in getting all of the business, but this was a general practice that when a coal company had in mind the purchase of new equipment, they contacted [1155] both Marion and Bucyrus. So, I would say that perhaps in that period of time there were some, a minimum of 50 discussions of that nature.

Q Mr. Drollinger, are you currently familiar with the present state of technology in the design and construction of large stripping equipment?

A Yes, I am.

Q Have you kept abreast of any developments which may have arisen since you left Marion in June of 1968?

A Yes, I've followed very closely the operation of both the Marion machines and the new large Bucyrus machines. I've made numerous field trips, I've continued my association with the coal miners through these associations, these trips.

Q Mr. Drollinger, during the period of time at Marion, while you were Vice President of Engineering and head of Machinery Design, was it a part of your duties to be familiar with the limitations of large strip mining equipment in terms of economic feasibility?

A Yes, it was.

Q Can you describe the extent of your familiarity with the limitations of stripping equipment in terms of economical feasibility?

[1156] A Well, it was—normally these proposals went this way: the customer would have some production requirements that he needed to fulfill. He also had some idea through test drillings and that type of thing to know what the stripping operation would consist of. So, it was necessary that he contact the appropriate people. This job initially fell on Engineering to make the first proposal, and it was in this way that we participated in all of these discussions.

Q Now, Mr. Drollinger, could you name some of the coal mining companies with whom you personally worked in evaluating the suitability of strip mining machinery for particular coal mining sites?

A Yes. Some of the names that I recall, Peabody Coal Company, Ayshire Collieries, Southwestern Illinois Coal Company, Truax-Traer. These are the types of companies that I dealt with.

[1157] Q Now, Mr. Drollinger, in general terms can you describe the functions that a stripping machine must perform in strip mining coal?

A Yes. It's the function of this stripping machine to remove the material that overlies the coal, deposit it far enough away from the excavations so that the coal can be taken out. The material that's taken off the top of the coal is called overburden, and this is the term that's applied—that's the material overlying the coal.

Q If I understand you correctly, overburden is expressed in the number of feet or a particular depth, is that correct?

A That's correct.

Q Is the term "overburden ratio" also used in the strip mining business?

A Yes, sir, it is. It's a term that's vital in the sizing of a machine. Overburden ratio is the ratio of the number of cubic yards of material that must be moved to get at a ton of coal. There is a general rule of thumb that says that the overburden ratio—perhaps I best illustrate.

If the overburden depth is 80 feet and the coal seam is 4 feet in thickness, the overburden [1158] ratio in this rule of thumb approach would be 80 divided by 4, or 20 to 1. This term is used extensively in strip operations.

Q Mr. Drollinger, do you know what the largest strip machine currently operating in Illinois is?

A Yes, it's the Marion-type 6360, in operation at the Captain Mine, Southwestern Illinois Coal Company.

Q Do you know what the extent of overburden being removed by this machine at this site is?

A That machine is operating in overburden of about 80 feet in depth.

Q Now, Mr. Drollinger, what role did you personally have in the design and development of this Marion 6360 machine?

A The Marion 6360 was developed during the period of time when I had the responsibility for the engineering department. Now, I'm sure you understand that this was not a one-man operation, and I had control and the responsibility for the department. I didn't personally put all the lines on the paper.

Q So that we can understand a little bit of the dimensions of the Marion 6360, can you give us some of the

vital statistics on this machine in terms of height, weight, bucket size and so forth.

[1159] A Yes, sir. Mr. Haubold, this is a difficult piece of equipment to describe. I'm sure that when you hear the word "excavator", many people automatically think of the machines that they see parked alongside the highway, but this is a far cry from this type of machine.

The Marion 6360 had a working weight of 28 million pounds. It had a 180 cubic yard bucket. Now, these dimensions in themselves are not meaningful, but we made some comparisons at one time to illustrate the size of the machine. We found that the 180 cubic yard dipper was sufficiently large to hold 15 Volkswagens. The machine has the capability of lifting a half a million pounds, swinging that half a million pounds about a tenth of a mile away, and depositing that half a million pounds on the top of a 15-story building. So, you see, it's not the type of machine that you see digging basements and in areas like that.

[1160] Q Is this machine, Mr. Drollinger, designed for stationary use or does the machine move?

A The machine is mounted on eight crawlers of the type similar to those that you might find on a bulldozer, and again it's only the type of mechanism that we're talking about. These are tracts. But, again, to give you an idea of the tract size, there are about 340 such crawler shoes making up these eight belts. I guess 342, to be exact, and each one of these crawler shoes weighs as much as two average automobiles.

So, you can see that we're talking like 700 automobiles in weight alone, just to make up the crawler shoes.

Q What is the height of the machine, Mr. Drollinger?

A Well, the machine over the boom point is probably in the neighborhood of 180 feet. As I said, it can deposit this half million pound load on the top of a 15-story building, so the boom point is higher, of course, than the load, about 180 feet.

Q Mr. Drollinger, what did this machine cost the coal company to purchase from Marion?

A Well, that's a difficult question to answer, Mr. Haubold, because there are a number of things that [1161] must be considered in the cost.

First of all, there's the original purchase price, and this is a machine that costs the customer FOB Marion about $16 million. But there are other costs involved, costs that have a definite bearing on the machine cost ready to operate.

Q Could you describe these additional items of cost from the customer's standpoint?

A Yes. It's the customer's responsibility to pay shipping costs for a machine of this size, and again to give you some concept of the size, it required 350 rail cars, standard rail cars, to ship the machine, so the freight bill alone was rather large.

Then it's also the customer's responsibility to assemble the machine on the digging site. This requires about 300,000 erection hours. These are hours spent in the field after the machine arrives, at a cost of $6.00 an hour, which is a reasonable number for field labor of this kind. You can see that there's approaching another $2 million in cost in erection fees alone.

[1162] Q Mr. Drollinger, from the standpoint of economic feasibility, do you have an opinion as to what the maximum capabilities of the Marion 6360 machine is in terms of maximum overburden removal?

A That machine was designed to operate in overburdens not to exceed as a general practice 100 feet.

Q From the standpoint of economic feasibility, Mr. Drollinger, how is the depth of stripping operations related to machinery size?

I guess what I am really asking at this point is, why do you need a machine of such enormous size and cost to handle 80 feet of overburden?

A Well, it is necessary when you are handling overburdens of this depth to remove the material as quickly and as efficiently as possible.

I am sure, again, you understand that, to be completely ridiculous, if you would want, it would be possible to remove this type of overburden with a teaspoon, but this is not a practical approach from an economic standpoint. So, the concept is to have a big machine of this capacity moving the overburden. This is this only way it is economically practical.

Q Mr. Drollinger, you stated that the Southwestern Illinois Coal Company site which utilizes the Marion 6360 re- [1163] moves approximately 80 feet of overburden.

Are you aware of what overburden requirements the Marion machine was required to meet at this site in order to be economically feasible?

A Yes. This was one of the original design considerations for the machine. Southwestern Illinois Coal had commitments for enough coal to fill a 180-car train on a daily basis.

Then, knowing the material that had to be removed to obtain that kind of coal production, the Marion 6360 was developed and sized accordingly.

Q Do you know in terms of cubic yard removal what the overburden removal as contrasted with the coal production figures was required at this site?

A The machine was developed with the capability of handling about 5 million cubic yards a month.

I would say, again, as a good comparison, this is like 50,000 standard hopper cars, to give you some idea of the production.

Q Mr. Drollinger, has Marion ever made an attempt to determine the per hour cost of operating the Marion 6360?

A As part of our initial study—as part of Marion Power Shovel's initial study, we tried to establish [1164] what the operating cost of a machine of that size might be or what the down time would actually cost. We estimated that that down time would run in the order of magnitude of $3,000 an hour. This number was confirmed, by discussions with mine management after they had the machine in operation.

Q In determining these costs, Mr. Drollinger, what assumptions were made in terms of the machine's operating life?

A It is general practice for a machine of this size to be operated on a year-round basis, three shifts a day. It is generally assumed that the machine would operate for no less than 25 years. That is pretty much determined to be the minimum period of operating life for these machines.

[1165] Q In terms of the assumptions relating to the machine's operating life, on a daily basis, what type of

operation were you considering here? Was it a virtual 24-hour operation? You mentioned three shifts.

A Yes. It is a three-shift operation virtually, as much as practical, 24 hours a day.

Again, to give you some idea of the necessity of keeping this machine in operation, it is standard practice for the coal companies to allow the oiler—this is a two-man operation generally, an operator and an oiler. In order to keep the machines in operation during the period of time that the operator is eating his lunch, the oiler is given the opportunity and the requirement to operate the machine and keep it digging. That is the whole requirement.

Q Mr. Drollinger, in the context of the Southwestern Illinois project involving this 80 feet of overburden removal, I would like to get some idea as to how difficult a task it was to design this Model 6360.

Can you describe any major difficulties you encountered in the design of this machine, if any?

A Yes. There were many, many problems involved. The sheer size of the unit alone brought on many problems, many that we had not planned on initially.

[1166] We talked before about the crawler shoes; the problem in getting a million and a half pounds of good sound castings is a real problem in itself.

To give you some idea of the engineering time involved in the development of a machine of this size, Marion spent about 80,000 engineering hours alone in the development of this machine. This is like 40 man-years for one man to work up the machine.

Q How important a consideration was reliability in designing this 6360 machine?

A Without question—

MR. EISEN: We would stipulate that reliability was important, your Honor.

MR. HAUBOLD: I would prefer that the witness answer the question and describe the context in which reliability played a role.

THE COURT: Go ahead.

BY THE WITNESS:

A Reliability was the number one item of consideration in the development of these machines. As I say, this

is not an excavator. It is for all practical purposes a digging factory. When it is not in operation, the man's factory is down. It is vital that the machine stay in operation.

[1167] BY MR. HAUBOLD:

Q Were there any problems encountered in terms of this particular machine's operations in the context of the pit operations which caused you special difficulty when the overburden approached or exceeded 80 feet?

A Well, there were a number of problems that had to be considered as a part of the initial design. Some of the problems—some of the considerations we had fortunately did not turn out to be problems, but there is difficulty in the operation of a machine of this size in knowing whether or not the sheer weight alone would destroy the pit.

This is difficult to describe. Perhaps the best comparison I could make would be to consider a billiard ball or something of this nature sitting on a wet napkin.

We had concern—no one had ever put a 28 million pound machine on a coal seam before. No one knew whether or not the coal seam would sustain that kind of a weight. The gambles involved and this kind of thing, I am sure you can appreciate, were rather large.

If the coal seam would not hold the weight, if the material below the coal seam would not give firm [1168] enough footing, it is conceivable that the unit would have gone through the coal and, for all practical purposes, the $16 million investment, the initial cost, would have been lost because the machine can't operate that way. It is necessary that it operate on the coal.

[1169] Q Mr. Drollinger, in the event that an unforeseen technical problem might have arisen involving the inapplicability of this machine to the given site who bears the risk of this cost in terms of industry custom and practice?

A It has been industry custom or practice in the past that the vendor, the machine vendor bear the cost of any field failures, any field fixes that are necessary.

I am told that Marion Power Shovel is now available for sale at some number like $22 million. This is im-

portant only in saying that the Marion 6360 for all practical purposes represents the net worth of the company. An error in judgment for all practical purposes could bankrupt the company.

Q Mr. Drollinger, are there any problems which become more accentuated in terms of difficulty and expense when overburdens increase concerning removal of the overburden or the material under the surface?

A Well, the purpose of the machine as we talked is to remove the overburden and deposit it in such a manner that it doesn't come back into the excavation. As the overburden increases in depth, the problems involved in depositing this material far enough away to keep it from coming back into the pit, into the [1170] excavation, presents more and more of a problem.

I do know of instances where the spoil pile, the overburden deposited off to the side, has come back into the pit and has in some instances caused fatalities by crushing the operator as he was caught in the cab of these machines. So, this is a real problem.

Another problem that any excavation faces is that possibility of operating below the water table where they might flood the excavation and it might make pumping necesary if pumps will do the job. This only increases the cost. So, there are a number of considerations involved.

Q Mr. Drollinger, based on your experience and knowledge, do you have an opinion whether there are any practical limits on the maximum overburdens and overburden ratios likely to be achieved in the Midwest coal field within the next five to ten years?

A Based on my experience and the intimate customer contact that I have had, I would say that probably we are facing the limitations of about 100 foot in overburden depth, and at the outside, the maximum overburden ratio of 25 to 1.

Q Mr. Drollinger, is it possible by simply [1171] increasing machinery size to design and operate a stripping machine in the Midwest which is capable of stripping in excess of 100 feet of overburden?

A I think perhaps, Mr. Haubold, that it is possible to build, to design and put the lines on paper of a machine

that will dig in excess of 100 feet in depth. The method of fabrication of a machine of this size, the problems involved in operation, I don't know. There are many unknowns still involved.

Q Well, in your judgment, would it be economically feasible to build and operate such a machine in the Midwest?

A I can't believe that it would be economically feasible. I have indicated the numbers of problems involved in the design and fabrication of a machine of this size. There are companies besides the vendors of the equipment that also get involved in the fabrication of a machine of this size.

For example, one of the electrical vendors had to design and build an electric motor specifically for the Marion 6360, an electric motor larger in size of that particular type than they had ever built before.

[1172] I also know that for successful operation of the large Bucyrus walking drag line, it was necessary for a rope vendor to spend approximately $1 million to develop a machine capable of manufacturing the five-inch diameter rope that that machine required.

My point is that the participation of not only the company doing the initial design, but all of the associated companies, has a bearing on whether or not a larger machine could be built.

Q If the decision were made today that a larger machine would be built or, at least, it would be attempted, do you have any opinion as to how long it would be until such a machine could conceivably be operating in the field?

A Well, that is a difficult question to answer. The Marion 6360—and I guess that is the only way I can answer it—the Marion 6360, the 180-cubic yard machine, required some three years from the time the initial discussions started until the machine was ready to go into operation. Without knowing what problems might be involved and without considering any unknowns at this time, I would presume that perhaps as long as five years would be required before a machine larger than the 6360 could be developed and put into operation.

[1173] Q Do you have any kind of rough estimate as to what this machine might entail in terms of consumer cost if it could be technically built?

A It is safe to assume that the Marion 6360, ready to dig, costs in the order of $20 million. It is conceivable to me that a machine perhaps half again as large as the 6360 might run double the cost, perhaps as much as $40 million.

Q So that I understand you, you do not believe that this is as feasible possibility at this time from an economic standpoint?

A No, sir.

Q Are these large machines that we have been talking about such as the Marion 6360 readily transferable from one coal mining site to another?

A Mr. Haubold, these machines are designed to operate in a particular pit. The overburden ratio, the type of pit, the coal—all of these have a bearing on the machine design.

If you will recall, we also said some 300,000 hours erection time was required to put them together initially. So, it is plain to see that to tear a machine down—the machines are actually fabricated in the field much the same as a ship is built on the waves.

[1174] Both Marion and Bucyrus follow the practice of taking to the field regular machining equipment, milling equipment and this type of thing. The machine is too large to bring into a machine shop. I am sure you appreciate that.

So, because of all of these limitations, it is not practical to assume that a machine like that could be torn down, shipped and reassembled in another area.

[1175] Q Mr. Drollinger, in your discussions with coal mining companies concerning the economic feasibility of utilizing your Marion machines for various coal mining sites, has the subject of reclamation requirements or laws ever been considered?

A Yes. Reclamation, of course, is becoming more and more of a consideration for mining companies. It is a definite cost in stripping that must be considered. The higher the overburden—I am sure you appreciate

that the larger the machine and the higher the overburden, the more difficult it is to level out the spoil piles that are deposited from the excavation. The more difficult it is, of course, then the more cost is involved.

I know that coal companies have been searching for equipment large enough to allow them to perform this reclamation at some reasonable cost. The present equipment with the large machines is not practical from a cost standpoint.

Q Mr. Drollinger, did you have the opportunity to examine Table 5(a) in the report prepared by the Paul Weir Company in this case?

MR. HAUBOLD: A copy of this report, your Honor, has been received in evidence as Exhibit 87.

[1176] MR. EISEN: Is that a defendants' exhibit or a Government's exhibit?

MR. HAUBOLD: It is defendants' exhibit.

BY THE WITNESS:

A Yes, sir, Mr. Haubold, I have examined this Table 5(a).

BY MR. HAUBOLD:

Q This table purports to reflect the initial investment per ton required to strip mine coal at various overburden ratios.

Now directing your attention to the data on the cost of stripping equipment, are the figures set forth accurate?

A Looking at the column for overburden ratio, 25.2 to 1, Mr. Haubold, I see that the stripping shovel capital costs are estimated to be $15 million.

As I have indicated, I would expect that the ready-to-operate cost of that machine is in the order of $20 million. So, these figures are conservative.

The initial investment, this $11.75 investment per annual ton, I would think should be higher than it is shown here.

MR. HAUBOLD: I have no further questions, your Honor.

• • • •

[1219]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before the HON. EDWIN A. ROBSON, Judge

Thursday, April 9, 1970

10:40 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM and
DR. PETER STEINER.

• • • •

[1232] GEORGE GAMBLE,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name, address and occupation.

BY THE WITNESS:

A George Gamble.

THE COURT: Spell your last name, please.

THE WITNESS: G-a-m-b-l-e.

BY THE WITNESS:

A (Continuing.) My address is 1821 Viking Way, La Jolla, California. I am a self-employed consultant, working primarily for Gulf General Atomic in La Jolla.

BY MR. HEDLUND:

[1233] Q Mr. Gamble, would you please briefly describe your educational and business background.

A I graduated from the University of Virginia in 1922 with an E. E. degree, electrical engineering.

I went to work for the General Electric Company in Schenectady, New York, on their test course, and later worked in the field and office for them for about two years.

I then went with the Stone & Webster Engineering Corporation of Boston, and worked in the field and also in the office for them for a total of 7½ years.

My last job was that of resident electrical engineer on the Osage Hydroelectric Project in the State of Missouri which was being built by Stone & Webster for the Union Electric Company of St. Louis.

At the completion of that job, construction work was at a very low ebb, indeed. I was offered a position by the owning company, Union Electric. I had the presence of mind to take the job and stay there the rest of my working life.

When I went with Union Electric, I started as a, I presume, a junior engineer with no particular title. Over the course of the next 34 years, I became [1234] Superintendent of Power Production and Vice President of Power Production and Vice President of Production and Distribution and Operating Vice President and Executive Vice President.

[1235] Q Was executive vice president your title upon your retirement from Union Electric?

A Yes. That was on October 1, 1966.

THE COURT: After that, you went to a sunny climate?

THE WITNESS: I went to a good climate, yes. Not St. Louis. St. Louis was not good. I will take up St. Louis, too.

THE COURT: In the summer?

THE WITNESS: Yes, sir.

BY MR. HEDLUND:

Q Mr. Gamble, at any time were you a member of the board of directors of Union Electric Company?

A Yes. I was elected in April of 1962 as a director, and I am still a director.

Q You are still a director?

A Yes.

Q Would you tell me, Mr. Gamble, what responsibilities you had in the last six years of your employment by Union Electric, what responsibilities you had with respect to the coal buying by that utility?

A Well, the last six years, that was after we had divested ourselves of any coal mining properties. I simply had broad supervision over the Purchasing Department where we had, you might say, a very highly [1236] qualified expert who was actually the coal buyer. I didn't do any coal buying as such myself, but he did the buying and he was responsible to me. He was one of, oh, roughly six or seven departments that reported to me.

Q Could you tell us the name of the man to whom you were just referring?

A Mr. Mark Covell.

Q Could you spell that, please?

A C-o-v-e-l-l.

Q Did anyone succeed Mr. Covell in his function?

A Mr. Louis R. Tomey, T-o-m-e-y, succeeded Mr. Covell just about the time that I retired. Mr. Covell and I retired within six months of each other.

Q At the time you retired, was Mr. Tomey reporting directly to you?

A Frankly, I have forgotten whether Tomey—whether Mark retired a little ahead of me or a little after; I don't remember. But he would have reported to me had he succeeded Mr. Covell at that time.

Q You mentioned the coal mining activities of Union Electric. Could you tell me what, if any, participation or responsibilities that you had in that regard and the dates on which you had those responsibilities?

A When I became operating vice president in [1237] 1954, I took over from the preceding operating vice president, who at that time became executive vice president. I took over the running of our coal mines as part of my several departments of responsibility.

I had, more or less, administrative disposition, management of those mines. I never pretended to be a coal miner, but I was seeing that the mines were run in a way acceptable to our management.

Q Was the coal mining activity of Union Electric carried on by a subsidiary of Union Electric?

A It was under the Union Colliery Company which was a subsidiary of our company.

Q Did Union Colliery have a mine in Illinois?

A Yes.

Q What was the name of that mine or mines?

A The name is the Kathleen Mine down in DuQuoin, Illinois.

Q Would that be in the Belleville freight rate district, if you know?

In that connection, I show you what has been received in evidence as Nugent Deposition Exhibit 38, which is a map of shipping coal mines in Illinois by Jack Simon.

MR. FUTTERMAN: Mr. Hedlund, the Government will [1238] stipulate that it is in the Belleville freight rate district.

MR. HEDLUND: Thank you.

[1239] BY MR. HEDLUND:

Q Mr. Gamble, let me start this way, if I may. What became of the Union Colliery properties in Illinois in, say, 1958?

A The Union Colliery mine and reserves were sold in, I believe it was 1958.

Q To whom were these properties sold?

A A combination of Truax-Traer and United Electric Coal Company.

Q Do you recall what was sold to each of those companies?

A It was my impression at the time that it was a joint sale, but I know that they divided up. Maybe we knew that, but I wasn't really negotiating the sale. So that the coal mining reserves, especially the strip reserves, which were contiguous to the United Electric Coal properties and were part of our coal reserves, were taken over by United Electric. The mine itself and the equipment and tipple and what-have-you were taken over by Truax-Traer.

Q Do you know whether the mine continued in operation after this sale?

A I am quite sure it did not, certainly not for any length of time.

[1240] Q Could you tell me, sir, prior to this sale, who consumed the output, if you know, of the Kathleen Mine of Union Collieries?

A That was a 100 percent captive operation of our company. We burned all of the coal that came from it. We had our own railroad to deliver that coal from DuQoin to our plants.

Q Why did Union Electric decide to dispose of the mining properties of Union Colliery?

A Well, at the time that decision was made, the coal business was becoming a very large business, indeed, in general. There were a good many strong companies in the field. The cost of strip mining and other things were beginning to bring down the cost of coal.

Frankly, we didn't feel that we could be in the best interest of ourselves and our customers by continuing

what might be a small mining operation. We thought we could do better by getting competition between professional coal mining suppliers.

Q Did you believe that you would be able to buy your coal cheaper from coal producers than to mine it yourself?

A That was our belief.

[1241] Q Did subsequent events prove you correct?

A I am very sure they did.

Q Mr. Gamble, I show you what has been received in evidence as Government Exhibit 87, which is a table entitled "Acquisitions in Eastern Interior Coal Province Since 1954."

MR. HEDLUND: Does the Government have a copy of the report?

MR. FUTTERMAN: Yes. Just a moment.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: (Handing document to Court.)

BY MR. HEDLUND:

Q I direct your attention, Mr. Gamble, to page 2 of this chart. You will notice in the left-hand column that it is headed "Acquiring Coal Company." In that column, there is the name of Truax-Traer. It refers to an acquisition of the new Kathleen Mine of Union Colliery.

My question, sir, to your knowledge, is that the properties that we have been discussing in terms of the sale to Truax-Traer?

A I am very sure it must be.

Q You will note that that acquisition on that [1242] table is dated 1958, and there is a production figure for the last year prior to the acquisition, the tonnage of 1,157,000, I believe.

Was that approximately the production of the new Kathleen Mine in 1957?

A We called it normally a million-and-a-quarter-ton-year mine that qualifies in any one year.

[1243] Q Do you recall when the new Kathleen Mine was opened?

A 1947.

Q Mr. Gamble, I show you what has been received in evidence as Government Exhibit 53, which is a chart entitled "Production of Coal in Illinois by the Leading Companies and their Subsidiaries for the 1958 Calendar Year."

I direct your attention—

MR. HEDLUND: May I approach the bench, your Honor?

THE COURT: Yes, you may.

MR. HEDLUND: Thank you.

BY MR. HEDLUND:

Q I direct your attention to the listing of companies, and ask you if the name Union Colliery Company appears thereon?

A Yes. It is roughly the fifth from the bottom.

Q Would that be the same Union Collieries, to your knowledge, that we have been speaking of?

A Yes, I am quite sure it must be.

Q I note that on that table, there is production of 577,000 tons. You have testified this was basically a million-and-a-quarter-ton mine of annual [1244] production.

Do you know why the production of that mine decreased from 1957 to 1958?

A Well, the mine was sold in May, I think it was, of 1958. I think it was May 29th. So, we had only five months of production in that year. That would be far short of an annual production.

Q Mr. Gamble, could you explain briefly the nature of your consulting work for General Atomic and briefly how you came to become a consultant for General Atomic?

A Well, how I became that was somewhat of an accident. I called up Mr. Claire one day to ask him a question. When we got through, I said, "I hope I see you someday before long, Ty. If you want to see me before I retire, you better get by here pretty soon." He said, "My God, are you going to retire?" I said, "Yes."

So he said, "Come here and go to work for us." That was the story. It was a longer story than that, but I did go to work for them.

Q Mr. Claire was whom?

A Titus Claire, he was one of the Gulf dealers at that time at General Atomic Division of General Dynamics. He was in charge of their so-called commercial—[1245] we never used the word—sales department. That is what it amounted to. So, he got me to come out there and go to work for them primarily on account of my—well, two things: my general knowledge of the way power companies function in the field of power, and also primarily because I knew a great many people in the industry, having been reasonably active certainly within the last 20 years. So, I worked with them out there since that time.

At first, I put in a year or two of doing a fairly decent job of learning the science. I thought that my ripening years had got me past completely in the atomic field. I graduated from Union Electric without knowing a thing about atomics, but I went out there and had to start over again. I did a fair job and I do understand what it is they are doing. I don't pose as an expert, but I can keep up with a good many people on it. I have used that in my contact with utilities and have helped them make contacts and it helped make some of the presentations to the utilities.

Q Could you briefly describe the reactors under development by General Atomic?

A Yes. The first reactor is what we call the high-temperature gas-cooled reactor, which is a [1246] reactor in the thermal spectrum. It is, you might say, a competitor or similar to the water reactor as manufactured by the four other manufacturing companies in that it generates heat through the use of what we call slow neutrons, namely, in the thermal field.

[1247] I state that to differentiate it from the so-called fast reactor which I will talk about a little bit later.

Now, in the high-temperature gas-cooled reactor, Gulf General Atomic, as I will now call it because we were

bought in November of 1967, I believe it was, by Gulf Oil—that must be November of 1968 by Gulf Oil.

We did complete in the early summer of 1967 a 40,000 kilowatt—a 40 megawatt plant on the system of Philadelphia Electric Company which illustrated and used the technique of gas cooling. I might say that it did so very successfully.

In the power business these days, that is a comparatively small plant, but it did illustrate the principle.

We then moved on and are building currently, some 65 percent complete, a 330,000 kilowatt plant of the same type near Denver, Colorado, on the system of the Colorado Public Service Company. Now, that plant will use the same physics and atomic principles, but its hardware will be considerably different and more nearly like we would use in the large plants. We expect that plant to be essentially completed next year and in [1248] commercial operation the first part of 1972.

Very recently, we have submitted a proposal for an 1,100 megawatt, 1,100,000 kilowatt plant up in Oregon to the Eugene Water Board. They have also received bids from the four light water manufacturers, and those bids are currently being considered. If we are a successful bidder, that will be our first large plant.

Q Mr. Gamble, if I may interrupt, if you know, approximately—you referred to an 1,100 megawatt station in Oregon. What would a comparably-sized coal-fired plant consume in coal?

A Well, a thousand megawatt plant consumes roughly 2½ million tons a year on about an 80 percent load factor basis. Eleven hundred would take 10 percent more than that. I would say 2,750,000 tons.

[1249] Q Can you go up the scale in direct proportion, that is, a million killowatt station would consume 2.5 million tons of coal, and therefore a 2 million kilowatt station—

A That is a straight line law, yes.

Q (Continuing)—would consume 5 million tons of coal?

A Well, I was talking, I'm afraid, when you were asking your question, so I didn't get the 5 million as fast as you did.

Q Would a 2 million kilowatt station consume approximately 5 million tons of coal?

A That's correct, yes.

Q Is Gulf working in the development stage or otherwise on a reactor other than the high-temperature gas-cooled reactor?

A Yes. We are currently right far along, at least with all the preliminary work, on a gas-cooled fast breeder reactor, which will be the next generation of reactors after the so-called thermal reactor, and we believe we have a very effective principle, and we are hopeful of seeing that developed in due course.

Q Can you tell us briefly, without going into too much detail, say, the most significant aspect of the [1250] gas-cooled fast breeder reactor under development by General Atomic?

A The most significant feature is this, that since we have no water in our reactors at all and since we have no sodium or any other material except gas, our fast neutrons are able to stay fast and do a very thorough job of reacting with other atomic particles and consequently performing the breeding function, which means that we can produce in our fast gas-cooled reactor, we expect to produce, 155 percent as much fuel as we burn. The other reactors in the field are not able to come up with that ratio of reproduction because they have more things within them which slow down the neutrons.

Q In other words, this breeder reactor will produce approximately 1.5 times the amount of fuel that it consumes?

A It will fuel itself again and give you enough to charge half of another reactor.

Q Mr. Gamble, without asking you to be too much of a salesman, could you tell me briefly what benefits the high-temperature gas-cooled reactor that you have already built and have a proposal in, what advantages that has over the pressurized water reactors [1251] and the boiling water reactors?

A Well, there are fundamentally two. The first is that we, since we are at high temperature and high pressure, we have the same thermal efficiency as a high

pressure, high temperature fossil fuel plant, which now is the end of many years of industry experience, and, consequently, those plants now are very efficient, and by that more of their heat is converted into electricity and less of it goes into the cooling water.

[1252] Now, our atomic reactor, the high temperature gas-cooled reactor, does not reject any more heat to the river or require any more condensing or cooling water than does the fossil fuel plant. Unfortunately, in the water reactors, they are not able to go to that high temperature and high pressure, and consequenly they have a lower over-all efficiency, which means that they do reject to the river at least a third, almost 50 percent, more than we reject to the river or that a fossil fuel rejects. By "rejecting", I mean that they put that much additional heat into the circulating water that is used to condense the steam after it goes through the turbine, which is just part of the steam power plant cycle. Now, that is one.

Now, the other one, which I think is really more significant, is that we do not use a large charge of uranium 238 and uranium 235 as do the water reactors. They generate plutonium. When you take—let me backtrack a second.

Uranium in nature is about 99.3 percent uranium 238, and only about seven-tenth's of one percent uranium 235. Uranium 235 will fission, split, send out neutrons, whereas uranium 238 will not, and the water reactor, when the uranium 235 atom splits, some of [1253] those neutrons split other atoms, releasing heat and continuing the reaction. Others of them hit and stick, you might say, in the uranium 238 atom and make it uranium 239, and after it goes through certain of its own little stunts, it turns itself into plutonium 239, and plutonium 239 is fissionable, and that is where the breeding—there's a breeding takes place in all reactors.

Now, you do not call it a real breeder until it makes more than it consumes, but in the water reactor, they make plutonium, which is really best used in a fast reactor and not best used in a thermal reactor. It can be used there.

In our reactor, we do not use a great quantity of this uranium 238. We use enriched uranium 235 and a great quantity of thorium 232, and when one of these electrons, neutrons, hits the thorium 232, it converts it into uranium 233, picks up one, 233, which is a very fine atomic fuel, a better reactor than the uranium 235. Now, neither uranium 233 nor plutonium appear in nature. Those are man-made, and they are made in these reactors, and we have a better fuel that we can make in uranium 233, which is applicable to be used in other thermal reactors, has not got the [1254] weight for the fast breeder to come along to use up the plutonium. Now, plutonium is going to be used in thermal reactors, I'm very sure, but it is not a simple process. I hope that's not too technical.

[1255] Q So that I understand, the second significant aspect of the high-temperature gas-cooled reactor is that it is a better breeder or a more efficient breeder of additional nuclear fuel than the water reactors.

A The thermal reactor, our high-temperature reactor is what we call an advanced converter because it does make some 75 to 80 percent as much fuel as it burns, whereas a water reactor makes something less than 60. I don't know what the—

Q To sum up the first significant aspect that you mentioned of the high-temperature gas-cooled reactor, its thermal pollution, if you will, aspect is no different than the thermal pollution aspect of a similar sized fossil or coal-fired plant, is that correct?

A That's correct. The high-temperature gas is the same as the fossil.

Q Mr. Gamble, has Gulf Oil been engaged recently in a survey or study with respect to the future demand for oil by electric utilities?

A Yes. Somewhat informal, but it is being carried on.

Q Did you participate in that study?

A Yes, I did.

[1256] Q Could you tell me what the results of that study were?

A I'd rather give a little fuller outline. They came to us because—

Q I am sorry, sir. "They" being who?

A Gulf Oil came to General Atomic because we do have this commercial department, you might say, that has good contact with utilities, and of which I am a member, and it's the reason I'm here, frankly, and so I was asked to participate in that study, and we did that by calling up and contacting and visiting, in several cases, various people in the utility business in the larger companies who happen to know pretty well, and find out from them what their current thinking is about the consumption of oil.

As a matter of fact, some surveys have indicated the consumption of oil by utilities was going to be on a downgrade, a negative tangent, but at least two of these people who had participated in the survey, as a matter of fact, said that they were sorry to say the survey was out of date even before it was published, and that things had changed markedly since that time, and that they were very much interesting in getting, if they could, low sulphur residual oil to burn in large [1257] quantities, on account of the impact of the air pollution regulations on the burning of coal.

THE COURT: Would now be a good time to take a five-minute recess?

MR. HEDLUND: Fine, your Honor. Yes.

THE COURT: All right. We will recess for five minutes.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

THE CLERK: Case on trial.

THE COURT: You may proceed, Mr. Hedlund.

MR. HEDLUND: May I have the last question and the last portion of the answer read back, please.

(The record was read by the reporter.)

BY MR. HEDLUND:

Q Mr. Gamble, based upon the information obtained as a result of the survey, your participation in it, are you able to predict what the future demand for oil will be by electric utilities in this country?

A That's a pretty big order. All I can say is this, that there is going to be a great deal more demand for residual oil in the next few years than even as much as one year ago we would have anticipated. The demand [1258] may not be met, there may not be enough residual oil available for the utilities to get all they would like to have, but we do know that the air pollution restrictions on burning coal, and most of the coal is high sulphur coal, has got the utilities in a bind where they will have to burn oil until they can get some of the SO, devices working, and that's not on the immediate horizon. [1259] Q Would you be able to quantify, assuming that this demand is met, the amount of oil you think will be consumed by electric utilities on an annual basis?

A You have to recognize this is pretty much of a guess, but I think I know the order of magnitude.

Q If you could just give us that.

A The order of magnitude will be somewhere between 300 and 500 million barrels, let's say with a ceiling of a billion barrels.

Q Do you know offhand what the coal equivalent of a million—did you say 100 million or 1 million barrels?

A Ceiling would be a billion.

Q A billion barrels?

A A billion barrels, yes.

Q Would you be able to compute the coal equivalent of that just in an order of magnitude?

A The other day I took a look at 300 million tons of coal, which is roughly the coal consumption now, and that came out to be something under 2 billion barrels, and I also put that against the amount of oil that may be in the Alaskan oil fields, and if we would be burning 2 billion barrels of oil a year, we could burn up all the oil that is believed to be in those reserves in a [1260] matter of definitely under ten years, so it is not an infinite supply of oil.

Q Mr. Gamble, based upon your experience with Union Electric, I would like to ask you some questions about the coal purchasing policy of Union Electric and utilities in general.

With respect to the coal supply for large power plants, for new power plants to be constructed, is that supply likely to be contracted for from the output of one, two or three or more mines?

A It's apt to be contracted for from the output of one mine, although it is possible it could be two, but fundamentally one mine would be most apt to get the contract for a unit.

Q Why is that, sir?

A Well, because both the coal mining business as well as the power business these days are mass production operations, and you build a million kilowatt machine or even a 500,000 kilowatt machine, you build a very large machine, and a 500,000 kilowatt machine will take about a million two hundred fifty thousand tons of coal a year. That takes a lot of trains of coal, and consequently you have to go to a big operation to produce that kind of coal. We bring a trainload of [1261] coal into our Sioux Plant every day from a mine, I think it is roughly a hundred cars. So, it's a mass production deal and a mass consumption deal at the utility end.

So, when you are preparing to build a plant, a new plant with large units, one of the first things you have to do is to find out where you are going to get your coal and what type of coal that is going to be, so you know best how to design your equipment.

So, it has become within the last decade, certainly more intensively as about the time that I was retiring than it had ever been before, a big business, because we have to buy, and do buy, 20, 30, as many as 40 million tons of reserves at one swipe.

Q Prior to the construction of a new power plant, how far in advance does a utility typically arrange for its supply of coal?

A Oh, I'd say a couple of years, long enough so you know what you are going to do, and when you go out for your boiler bids, that you will know what you are going to buy, so at least two years before you start your plant you ought to have a pretty good line on your coal.

Q Let me rephrase the question, because I think you may have misunderstood me.

[1262] What I am trying to get at is, prior to the construction of the power plant itself, how many years' supply of coal is normally contracted for before that plant becomes operable.

A I would say that you would not want to contract for less than a 15-year supply. Many times it's done for ten, but 15 years—and frequently those contracts will carry an option by the purchaser to renew for a period of 15 years. So, you could potentially have a 30-year supply, which incidentally would represent about twice as much value in coal as the whole power plant costs.

[1263] Q In negotiating for new coal contracts, what does a utility normally require with respect to the reliability of the coal supplier and the reserves available to that supplier?

A Well, as I said you're in big business, and you have great responsibilities of keeping that power plant running and turning out electricity to supply your customers, so consequently you do everything you can to see that you have the highest integrity type of supply. That means not only expertise in the business of producing coal, but also financial stability and also a good reputation for having been able, labor problems and other things, to live up to your commitments in the past.

Now, that's background, but then you've still got to have the amount of coal in the ground that is required to take care of the type of an obligation I've been speaking to. In other words, you've got to be able to sell coal that's in the ground, and whether you can produce a certain rate doesn't mean much, as long as it is big enough to take care of this plant, but you've got to have the coal in the ground that you are in a position to mine to supply that plant for the "X" years that you contract for.

Q Mr. Gamble, in terms of the responsibility [1264] for buying coal by a utility, is this a low echelon or a medium echelon or a top echelon management responsibility?

A Well, I'd say that it's medium to top. Some of the detail work, of course, is done by people further down the line, but it would be a very responsible department head. In the days when I was, say, broadly responsible for our coal purchasing, Mr. Covell, who is a very responsible and a very well paid man, was in charge of that among his other duties, and he was an expert on the subject of buying coal. Now, he had a certain amount of supervision from me, and we were both responsible to the executive committee and ultimately to the Board of Directors for such things as very large contracts. If you sign a contract for $130 million, why, you want to have a pretty good company feel of that before you undertake to do so.

Q Would you give me, Mr. Gamble, sir, your opinion with respect to the bargaining power that a utility has in negotiating contracts for the supply of coal?

A Anytime that you are in a position to sign up over a period of 15 or 20 years for a block of business between $50 and $100 million, you've got power [1265] in the market, and the coal producers can get hold of a large contract, which would run over a number of years, why, they know what they can do, they know what they can afford to do in the shape of opening mines and buying machinery, and it's a very important thing to them.

Consequently, there is great economic power in the hands of the coal purchaser.

[1266] Q Mr. Gamble, I show you what has been received in evidence as Defendants' Exhibit 102, which is a report of the National Fuels and Energy Study Group to the Committee on Interior and Insular Affairs of the United States Senate, dated 1962.

If you will, please, turn to page 274 of this document. With respect to the matters set forth in paragraph 1 on page 274, Mr. Gamble, I would like to know whether you agree or disagree with the following statement, as of 1962:

(Reading.) "Competition among fuels is a complex of economic, technologic and political forces. The three fuels, coal, oil and gas, compete with one an-

other for the electric energy, space heating and process heat markets. Electric energy, including hydro power, then competes with coal, oil and gas for parts of these same markets."

A That was certainly true in 1962 and partially true today.

Q In what respects is it only partially true today?

A Well, we have other competitors. We didn't think about in 1962—we didn't really realize in '62 [1267] how much competition there would be shortly from the atomic plant.

Q Would you please turn to page 289 of this document.

A I have it.

Q In the second full paragraph on that page the following is stated:

(Reading.) "The power generation market is probably the best mirror of what happens in inter-fuel competition. Minor differences in delivered price multiplied by very large quantities can amount to large sums of money to the user. Costs associated with utilizing fuels, handling, storage and entry facilities, also are large. The electric utilities are among the most well-informed buyers of energy and the quickest to take advantage of price differentials and changes in technology of utilization. Since electricity can be generated equally well by gas, oil or coal, no single fuel has an impregnable position in this market."

Would you agree or disagree with the portion I just read?

A That's correct.

[1268] Q I am sorry, sir.

A That's correct.

Q You would agree?

A None of them have any lock on the market.

Q Mr. Gamble, I show you what has been received in evidence as Defendants' Exhibit 150, which is an excerpt from the National Power Survey, a report by the Federal Power Commission, dated 1964 and published by the United States Government Printing Office.

First, Mr. Gamble, were you involved and, if so, to what extent, with respect to this National Power Survey?

A When this National Power Survey was started, I was requested by Mr. Swidler's office to be a member of the committee from the power companies who made a contribution to this study for the purposes of having the staff of the commission basically put together the final report, and I did work on that for the period, I imagine, about two years. I was chairman of one of the sub-committees on peaking, let's call it, and I was a member of, oh, four, five or six various committees in the some 17 or 18 various sub-reports that were as parts of this study.

[1269] Q Would you turn to page 54 of this document, please.

A (Witness complying.)

Q With respect to the second sentence in the first paragraph on this page, which reads as follows:

> "Just as nuclear technology is shooting at a continually moving target and attempting to overtake conventional steam electric generation, nuclear technology in turn is expected to set a continually lowering cost target which the fossil fuels and their modes of transport will be forced to meet."

Do you agree or disagree with that statement?

A I agree with it.

Q Turn, please, to the preceding page of this document.

A (Witness complying.)

Q In the first full paragraph on the page, the following is stated, and I will in reading it make an amendment to it which I am sure you will notice as I go.

> "In determining the type of fuel to be used for electric generation, there are a number of factors to be reviewed and evaluated. [1270] Each of these has a bearing on cost and influences the degree to which an electric utility is able to meet its obligation to provide reliable service at a reasonable price. The cost of storing, handling and in some instances disposing of the fuel product are economic factors

which can make a low-cost fuel the most expensive fuel. In locations where land costs are high and areas heavily congested, these costs become a major consideration in selecting a proper fuel. In some areas, operating conditions such as air control regulations may justify a premium fuel. Therefore, while a general picture can be drawn concerning the availability and price of fuel, the final determination in selecting a fuel or fuels for a particular plant must be based on the specific facts pertinent to that plant and its location."

Mr. Gamble, would you agree or disagree with the statements contained in this report as I have just read them?

A Yes. I think that is certainly true.

Q Mr. Gamble, were you aware, I believe it was [1271] in 1968, of the proposal made by Humble Oil to sell coal to the Union Electric Company?

A I am not sure I was acutely aware of it at that time. I probably heard of it, but I do not recall at the moment that I did.

MR. FUTTERMAN: Your Honor, I would like to make a statement for the record at this point.

As you know, the Pretrial Order No. 2 called for defendants to submit to the Government the expected testimony of the witnesses who would appear at the trial. I believe, although I haven't made any objection, that Mr. Hedlund is getting into a number of areas with this witness which were not specified to us in his letter of June 6th, 1969.

This may have some bearing or effect on the length of the cross examination.

MR. HEDLUND: Your Honor, I would be pleased to get that letter. I also want to point out that Mr. Futterman took Mr. Gamble's deposition. He has talked with Mr. Gamble on numerous occasions as to what he was likely to testify to, as recently as last evening.

I do not believe at this point that I have gone beyond any of the subject matters set forth in my initial letter, with the possible exception of this [1272] present line of inquiry which I believe is responsive to information

that the Government developed with respect to the examination of Mr. Tomey.

[1273] MR. FUTTERMAN: Well, I will just say at this point that at no time during my conversation with Mr. Gamble, nor during his deposition, did matters relating to Union Electric's fuel purchasing policies or his experience at Union Electric occur. The only thing that was brought out during the deposition was the fact that he was employed by Union Electric for the period he specified.

I am not making any objection, but I would just like to—

THE COURT: All right, let's proceed.

BY MR. HEDLUND:

Q Since that time, have you become aware?

A Yes, I have.

Q Mr. Gamble, what, if you can tell me, was the proposal by Humble and what were the results of its evaluation by Union Electric?

A As I now recall it, having looked into the matter more recently—I don't recall it in 1958—they offered to supply coal for our Labadie 2 unit. That was more recent than 1958, though.

Q I thought I said 1968.

A 1968. I realize I am wrong there.

In 1968, which, of course, was after my [1274] term of office with the company, but as a director I would have an opportunity to hear about it at least.

The proposition which I have recently learned consisted of supplying or offering to supply a full-fledged million and a half tons a year over a period of I think it was 20 years of coal from their mine up in the Springfield area.

Now, there were three things in the analysis which militated against that contract. The first is that it happens to be particularly high sulphur coal. Most of our coal we think of in terms of 3.4 to 3.5 percent sulphur. As I understand it, this coal was 3.5 to 4 percent sulphur which in these days and times is a pretty bad start.

Furthermore, it is very low BTU per pound, only 9,500 BTU per pound as against ten-five or eleven of most of the coals we get, and twelve and twelve-five for real good coal which we don't burn much of. But 9,500 is a very low BTU which means there is a lot of ash that has to be handled, because what is not burned is left over to handle through the ash disposal system.

Furthermore, they were handicapped by not having a single rail line haul into the plant. They would have to trans-ship it on a second road.

[1275] Now, there is some advantage to some diversity on railroad supply on account of wrecks and other things, but not when it amounts to a very substantial increase in the freight rate, which in this case it did.

So, the end product was that these people had a coal that was too high in sulphur, that was a poor coal from the point of view of BTU content and consequent handling and burning, and the price was too high. So, it was a very simple decision that they were not going to get the business.

* * * *

CROSS EXAMINATION

BY MR. FUTTERMAN:

* * * *

[1278] Q You testified that a utility has bargaining power in buying coal. Would it be your testimony that utilities have an unfair bargaining power over the coal producers?

A No, absolutely not.

Q Would your opinion be that the bargaining power is relatively equal?

A Yes. There are a number of strong producers of coal. They confront, the utilities, I say, across the buying or bargaining table both with great strength.

Q Is it to the advantage of the utilities to have a number of strong competitive coal producers soliciting their business?

A Yes, it is.

Q Do you believe that Union Electric as a utility

is in a better or worse or about the same bargaining position in relation to the coal producers as TVA?

A I don't see why we are in any better position than TVA. We do have and they do have, too, both a combination of rail and possible water transport. That is quite an adjunct to a competitive situation.

Q What about that same question as applied to [1279] Union Electric vis-a-vis Commonwealth Edison and the coal producers?

A I don't know that our competitive position would be any better. We ought to be able to get a somewhat lower price ordinarily because I think our freight rates to us would be lower or less than theirs, but that doesn't hold to the basic competition situation.

* * * *

AFTERNOON SESSION—2:15 P.M.

* * * *

[1325]

RECROSS EXAMINATION

BY MR. FUTTERMAN:

* * * *

Q Mr. Gamble, referring back to the area which you discussed during your cross and redirect examina- [1326] tions, that is, the area described by the Government as the Eastern Interior Coal Province Sales Area, do you anticipate that within that area in the next ten years that the total amount of electrical generation will greatly expand?

A It should follow the same law as the country as a whole would follow, and roughly each ten years the generation will double.

Q Do you anticipate, Mr. Gamble, that within that area the total tons of coal consumed will increase over the present level?

A The equivalent tons of coal will definitely go up and I would think that the present tons of coal will also go up, but we are in a transition period here when

coal is going to have a fairly rough time until these SO_2 devices get developed, and between now and the next ten years, it is not clear in my mind, and I don't know anyone else whose mind it is clear in, how the situation is going to be handled. It's really a,—well, for a man that's got to do it, it's a nightmare. You just cannot see through that maze.

* * * *

[1331] THOMAS LATIMER,

called as a witness by the defendants herein, having been previously duly sworn, was examined and testified further as follows:

CROSS EXAMINATION

(resumed)

BY MR. SIMS:

Q Back to the mines.

Mr. Latimer, UEC has listed on its reserve books approximately 5.3 million tons of deep coal at its Fidelity Mine, is this not true?

A Yes.

Q UEC may ultimately mine this coal, is this not true?

A It's possible.

THE COURT: What was the answer?

THE WITNESS: It's possible.

THE COURT: Yes.

BY MR. SIMS:

Q Mr. Latimer, UEC has attempted to acquire the Murphy tract at the Cuba Mine for some time, is this not true?

A Yes, for a long time.

Q Approximately how many acres are there in the [1332] Murphy tract?

A 193 acres.

Q You have estimated before, have you not, that there could be approximately one million tons in this tract?

A Something in that vicinity.

Q In 1969, did not UEC acquire at Cuba a portion of the Landis property?

A Yes, a small portion.

Q In 1969, did not UEC acquire at Cuba some coal at the Deakin property.

A Which property?

Q Deakin, D-e-a-k-i-n.

A Deakin, yes.

Q Yes.

Is it not true, Mr. Latimer, that at Cuba UEC has mined coal under 90 feet of overburden?

A Yes, indeed.

Q In fact, it has gone up as high as a hundred feet, is this not true?

A No, sir.

* * * *

[1340] MR. SIMS: Your Honor, the witness has testified among other things, to the fact that in January of 1970, [1341] UEC exercised its option to acquire the D. Harris property at Fidelity, which property contains approximately 1,700,000 tons of coal.

The witness also testified that these reserves do not appear on the latest reserve schedule of UEC which is dated December 31, 1969, and this property does not appear on Defendants' Exhibit 60-D.

The Government will not move to strike Defendants' Exhibit 60-D, which shows that UEC's reserves at existing mines are stated at 52 million tons, approximately, and have "a potential acquisition at UEC's present mines" of approximately 3,600,000 tons, as long as the Government will not be precluded from introducing in our rebuttal case evidence to show that these figures are not complete.

THE COURT: You certainly have that right at all times.

MR. SIMS: Fine.

THE COURT: Is there any question about the statement make by Mr. Sims here?

MR. HEDLUND: Your Honor, I am sorry, but may I have it read back? I am sorry to burden the Court with—

THE COURT: All right.

(Record read by the reporter.)

[1342] MR. SIMS: We have no further questions at this time, your Honor.

THE COURT: Do you accept it?

MR. HEDLUND: Your Honor, we will accept that, but we have some redirect examination.

THE COURT: Well, you have that right.

MR. HEDLUND: Yes.

THE COURT: All right.

MR. IRVING: Your Honor, may I have a moment to consult?

THE COURT: You may.

Well, all we are dealing with is the introduction of this document.

MR. IRVING: Yes, sir.

THE COURT: I just wonder what the redirect is.

MR. IRVING: Well, some of the redirect intends to go into the matters raised by Mr. Sims a moment ago.

THE COURT: Well, all I was dealing with was the introduction of the document here. They are not objecting to the document. The document is in evidence.

Now, I just inquire in that the direct examination was to lay the foundation for the introduction of the document, the Government cross examined to indicate whether or not the document would be admissible, [1343] and the Government now concedes that it is admissible, subject to that condition.

So, I ask, what would the redirect examination be on it?

* * * *

[1371]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,

Monday, April 13, 1970,

10:30 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III

• • • •

[1376] MR. CUSACK: I am referring to page 1222. At that time, and it did come as a surprise to us, Mr. Hedlund asked us what the witnesses would testify to. We stated that in regard to Mr. Hooper of Ayrshire Collieries, on page 1222 we would go into those matters, and we said that it is believed that is all we would presently ask him—Mr. Eisen said, "That is

all we presently have in mind," and Mr. Cusack said, "This is all we have presently in mind."

[1377] On Friday when we had the day off, I had an opportunity to review the file we had on Mr. Hopper. I then told Mr. Hedlund, I called him immediately after I had reviewed that file, and told him that in addition to the matters set forth at page 1222 of the transcript in reference to the expected testimony of Mr. Hopper, we may possibly ask Mr. Hopper three other matters: the availability of strip and underground coal reserves in Illinois; the cost to Ayrshire of its coal reserve acquisitions; and the mineability of the Industry Field.

In regard to Mr. Shumate, your Honor, we told Mr. Hedlund and the Court at page 1223 what we would ask him there. We certainly anticipated—we said we would examine him on the future strip mining possibilities in Schuyler and McDonough County areas.

I told Mr. Hedlund on Friday after reviewing Mr. Shumate's file that in addition to the possible testimony of Mr. Shumate as set out at page 1223 of the transcript, we may possibly ask him regarding the availability of strip and underground coal reserves in the Midwest and the cost to Zeigler of its acquisition of coal reserves.

We believe, your Honor, that this does not substantially change the testimony of the witness.

• • • •

[1382] NICHOLAS T. CAMICIA,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. IRVING:

Q Please state your full name and home address for the record, sir.

A My name is Nicholas T. Camicia.

THE COURT: Would you spell your last name, please.

THE WITNESS: C-a-m-i-c-i-a.

BY THE WITNESS:

A (Continuing) My home address is 85 Country Club Lane, Pelham Manor, New York.

BY MR. IRVING:

Q Mr. Camicia, by whom are you currently employed?
A The Pittston Co.
Q What is your business address, sir?
A 200 Park Avenue, New York, the Pan-Am Building.
Q What is your current position with the Pittston Co.?
[1383] A I am president and chief executive officer.
Q For how long have you held that position?
A A year.
Q Would you please briefly describe the fields of enterprise and operations of the Pittston Company?
A Well, briefly, the Pittston Company is a holding company diversified into principally coal mining. We also have armoured car services through our Brinks operation. We are a fuel oil distributor in the metropolitan area of New York and New England and Canada. We also have an interstate trucking company.
Q Approximately what would the annual production of your bituminous coal be, sir?
A We are presently at the rate of about 23 or 24 million tons a year.
Q To whom do you sell that coal principally?
What type of coal is it, may I ask?
A Principally, it is about 85 percent metallurgical coal. The remaining is utility and general use coal. We sell approximately 40 percent of our production for export.
[1384] Q Mr. Camicia, could you briefly describe your educational and professional background up until the year 1965?
A I am a graduate mine engineer from Virginia Polytechnic Institute. I went to work for a coal company called Island Creek Coal Company immediately after graduation. I spent a year or a year and a half as a common laborer in order to get some experience. Then I held a job as an engineer for a couple of years, proceeding from that to a section foreman or first line

foreman, superintendent, general manager, and finally vice president of operations and then I served as executive vice president of that company and on the board of directors.

Q About what year was it that you were named to the Island Creek Board of Directors?

A I think it was 1962. And at the same time I became executive vice president.

Q Did you serve in the Armed Forces at any time during this period?

A Yes. I forgot. During that period I was off for about five years and was in the Armed Services. Part of my service was on the staff of General Eisenhower, rehabilitating the coal mines of Holland and Germany.

[1385] Q Was most of your mining experience and training during this time in deep mining?

A Practically all of it. Essentially all of it.

Q Mr. Camicia, could you please describe the nature of your experience and positions held from 1965 to the present.

A In 1965 I came with the Freeman Coal Mining Company, which is a subsidiary of General Dynamics, as executive vice president. I held that position until January 1, 1968, at which time I was made president of Freeman Coal Mining Corporation and the United Electric Coal Companies.

During the time I was executive vice president of Freeman, of course, I had mainly responsibilities in the area of the deep mines of Freeman Coal Mining Company.

Q I take it about a year ago you were named president of Pittston Company, is that right?

A Yes. April, 1969.

Q During your term as executive vice president of Freeman were you primarily concerned with the deep mining operations as opposed to the strip mining operations?

[1386] A Yes. Almost entirely. I had an occasional discussion on the strip mining operations, but I had no responsibility whatsoever.

Q During your term as president of Freeman and UEC, did you become familiar with the strip mining operations of United Electric?

A Yes, I did. I was principally interested in the operations of the pits, and I spent a lot of my time during that year as president trying to find additional reserves, strip mining reserves, for UEC.

[1387] Q During your career in the coal industry, Mr. Camicia, would you say your experience has covered all phases of the business?

A I don't think there is any question about it. At least I have covered every phase possible in the deep mining.

Q As the chief executive officer of a deep mining organization, would you please give us an estimate of about how much of your time in the past year has been spent at the Pittston mines?

A I would estimate that I have spent about 80 percent of my time since I have been with Pittston on the coal mining phase of the company.

Q Does this include actually going underground—

A Oh, yes. I have covered every section, every mine and every facet of the operations.

Q Would it be normal in your opinion for the chief executive officer of a deep mining company to spend about this much time at the mines gaining first-hand knowledge of the mining operations?

A Well, deep mining being a highly technical and very difficult operating type of business, I would say that any prudent executive must spend a great deal of his time in order to become fully familiar with the operation.

[1388] Q Could you please briefly describe the different types of operations which are included in the term "deep mining"?

A Essentially on a broad basis there are perhaps, you could say, three types of deep mining, one of which would be called drift mining.

Drift mining means that the coal seams are exposed above the water level and are uniformly flat or level. The operation consists merely of punching or going into

the mine from the outside. It is the easiest type of mining, of deep mining.

[1389] The second phase could be classified as slope mining, which is a seam of coal below the creek bed or water level. It consists of putting in a slope of about a maximum of 17 degrees with a belt to bring out the coal.

These types operations are usually limited to a maximum of about 300 feet below the surface.

Then we have what we call shaft mining or strictly deep mining, and these will vary from, say, 300 feet down to, in this country, a maximum so far of about 1,600 feet. In Europe, of course, they go down as much as 4,000 to 5,000 feet.

In this country, it is 1,500 feet. That means you must sink a vertical shaft or several of them, so that the coal is hoisted by skips and hoisting machinery and the coal is brought out in that manner.

Q When referring to slope mining, you mentioned a belt. Could you further explain that?

A The belt is merely a means of lifting the coal from, say, the 300 foot level to the surface, as opposed to hoisting it vertically. It comes up a slope on a belt, and this, of course, is a cheaper method and an easier method of extracting the coal, bringing the coal out, than the shaft type of operation.

[1390] Q Would it be in the order of a conveyor belt?

A Yes. A belt conveyor.

Q Mr. Camicia, could you please describe some of the major problems faced in setting up a deep mining operation?

A Well, a deep mining operation is a very, very difficult type of operation and highly technical. Before you can even start a deep mining operation, you must have expert knowledge and know-how as to how to explore the seam. You must drill the seam, fore-drill the seam, to try to study what type of roof you will have, the roof being the seam rock above the coal seam.

You must try to determine how much gas will be emitted by this coal seam as you extricate the coal, as

you extract it. You must determine how much water you will perhaps have in this seam, so that you can plan on the drainage of that mine.

[1391] You must determine of ventilation that is needed to neutralize or to carry away the gaseous emissions and to comply with the Federal laws.

You must determine in advance what type of mining machinery can be used or should be used.

All of these items have a sense of risk about them, because you can make one bad judgment in any one of these items and your mine could be a failure. Every deep mine that is put in is a risk proposition from the word go.

Q You mention the planning for a deep mine. What level of employee would take part in this planning?

A This would be from the chief executive officer or the top mining man in the organization down through the engineering group and the operating group. It is the top management level really.

Q Are these problems that you mentioned similar in nature to those faced by strip mining outfits?

A Absolutely not. It is just a different ball game, a different business altogether.

Q Were a strip mining operation to attempt to open a deep mine, could it adapt and carry over knowledge and expertise to the deep mine which would enable it to carry out the deep mining of coal?

[1392] A I know of no phase that could be carried over, except perhaps in the marketing and sale of the coal.

There is no correlation whatsoever between the engineering or management or knowhow or knowledge of mining.

Q Would there be any similarity in the type or nature of labor force used at the mine once it was opened?

A No. It is an entirely different thing. You have to understand that strip mining is very, very similar to construction work. It is just an earth-moving problem. You can go out and pick up any kind of construction worker and start up a strip mine. But in deep mining it is a very different business, and it takes a different type of person, even insofar as attitude.

Q Mr. Camicia, based on your knowledge as former president of both Freeman and UEC, do you know if UEC has or has had any managerial level personnel, including mine engineers and superintendents, who have had deep mining experience?

A To my knowledge, at the time that I was there there was no one that could be classified as knowing anything about deep mining.

[1393] Q Based upon your knowledge and experience as former president of UEC and Freeman, and based upon your knowledge and expertise as a deep mining engineer and executive, do you think that it is likely that United Electric could make a successful grass roots entry into deep mining coal. By "grass roots," I mean an entry made through internal expansion rather than affiliation with a deep mining company.

A I don't see how it could possibly at all. I don't see how they could even make a start at it. It would be very difficult to even get any notion to try to do it.

Q What factors lead to this opinion, sir?

A Well, because I know the technical requirements of opening up, developing and operating a deep mine. The problems are so different as compared to the strip mining and so foreign to strip mining that it is just a different business altogether; because they are in the strip business would give them no reason whatsoever to think they could go into the deep mining business, no more so than—and I presume you are not a miner—no more so than you could go into the deep mining business.

THE COURT: You would be surprised at how versatile [1394] some attorneys are.

MR. IRVING: I will stipulate I am not a miner, your Honor.

BY MR. IRVING:

Q Do you know, from your experience, if the availability of qualified deep mining personnel—and I am including all levels now—is greater or lesser than those equivalent level personnel for strip mining operations?

A Yes, I guess I could be classified as an expert on that, because—and it is a good thing for we mining

engineers that there is a great, great scarcity of qualified managerial people in the deep mining, and there has been for a number of years.

[1395] The situation now is even worse and more critical, as a matter of fact.

Now, insofar as strip mining is concerned, and during my tenure as president of UEC, I had no problem going out and finding people, because I could go to a good construction job and pick up a pit foreman or a maintenance foreman that knew how to run trucks and take care of them. But to get a good foreman or superintendent for deep mines is entirely a different situation.

Q Mr. Camicia, from your personal experience do you know of any strip mining firm which has made a successful grassroots entry into deep mining in, say, the last 20 to 25 years?

A I know of none. I can only recall several years ago that Kennicott, who is a company that I think is principally in metal mining, copper mining, and so on, approached me to try to help them get into the coal mining business, the deep mining business. They had a number of what they called deep mine reserves, and they were trying to get into the business by employing someone like me to build up an organization and to try to get started.

I rejected the job. I advised them that [1396] it would be almost an impossibility to try to get into the business in that manner and suggested that they go out and try to acquire the management by acquisition. I think they did that. Peabody.

MR. IRVING: The defendants have no further questions at this time.

THE COURT: You may cross examine.

CROSS EXAMINATION

BY MR. EISEN:

Q Mr. Camicia, isn't it a fact that one of the reasons for the shortage of technically qualified help in underground mining is due to the fact that the coal industry

was depressed up until about 1960, which led to few people becoming interested in that field?

A I think you could say that that is one of the factors that perhaps kept young men from going into college and studying mine engineering, because the opportunities were not great.

Q Following 1960 the future of coal became much more optimistic as a successful enterprise, did it not?

A No. That is not true at all. From 1960 to 1968 is probably one of the worst periods in the coal business that you have had.

* * * *

[1398] Q Are you aware of the fact that Peabody has been retraining some of its strip miners to work in deep mines?

A No, sir, I am not.

Q Haven't other companies been doing this?

A Not that I know of.

Q You mentioned the similarity of deep mining and strip mining at least to the extent of the marketing of the coal, did you not?

A Yes, sir.

Q Would it not also be true that there was a similarity insofar as the processing of the coal is concerned and the exploration for reserves are concerned?

A Well, you are putting two things together. Let's first talk about the processing of coal, if you wish. There is some similarity between the processing of coal, but I included that with marketing. That is part of marketing. That is the processing and marketing and sale of coal.

But insofar as exploration work, there is very little similarity in that the only similarity is that in both cases, you find out whether there is coal there. But how to analyze what you have seen, that takes an expert in deep mining to determine whether that coal [1399] is minable by deep mining methods.

The strip miner can only determine whether it is minable by stripping methods.

Q You are aware of the fact, are you not, that UEC

acquired deep mining coal reserves some years prior to your coming with the company?

A Yes, I knew that.

Q Did they continue to acquire some of those reserves during your association with the company?

A Not while I was associated with them. As I said, we were looking for principally strip reserves for UEC during my tenure as president. I must say that during that time, I had a blank check from General Dynamics to get whatever strip mine reserves we could possibly find. I used every person available on this proposition.

Now, in looking for strip mining reserves, some of them are connected with deep mine coal. You cannot in certain instances accept or get strip coal without accepting responsibility for buying the deep mine portion of those reserves.

Q But you did learn, did you not, in the course of your association with UEC that they had acquired approximately 50 million tons of deep reserves at Round Prairie?

[1400] A Yes, sir. I knew that we had those reserves.

Q When did you first hear of the Round Prairie Field?

A Not really until I became president, which was the first of January 1968.

Q Did Mr. Nugent tell you why UEC had acquired Round Prairie reserves?

A I don't recall that he did.

Q Did you have any discussions along that line?

A After I became president, we had some discussions as to the possibility of mining these reserves. We had some feasibility studies made on it and some market feasibilities. It proved that it wasn't the right vintage yet, meaning that it may be mined someday, but it certainly wasn't time yet because of the market conditions.

Q Did you say that you had some feasibility studies made?

A Yes. On my own, yes.

Q What did those feasibility studies consist of?

A It consisted of studying the bore holes, determining what type of top there was, what the height of the coal was, what the quality of the coal was, what the drainage problems would be, what type of operation [1401] would be required to extricate the coal, what type of machinery would be required to mine the coal, what the capital costs were, and what the cost of mining would be, all of which proved that the coal could not be mined at a profit.

* * * *

[1418] "Q Mr. Camicia, assuming that a company owns or controls 100 million tons of underground coal, that such coal may be mined at a profit, either now or within the next 10 years, and that company is experiencing in processing, shipping and marketing of coal in the area, and that you have six [1419] to eight million dollars cash—given these facts, would it, in your opinion, be possible to hire competent personnel to put in a slope mine costing approximately six to eight million dollars?")

THE COURT: Now, do you recall the other question?

THE WITNESS: No, your Honor. I would like to have it read.

THE COURT: Read the question.

(The question read by the reporter, as follows:

"Q Does the foregoing hypothetical that I have given you apply, would you say, to United Electric as you know it, with regard to its financial position and its reserves?")

BY THE WITNESS:

A Well, to answer the first question, I don't think it is possible for the hypothetical company to do as you have so indicated.

Secondly, United Electric Coal Companies certainly was not in a position to go into a deep mine venture.

* * * *

[1422] BY MR. EISEN:

Q You do not know, do you, Mr. Camicia, whether had UEC not become affiliated with Freeman, it would

have gone into the underground mining business?

A I don't know the answer to that.

Q You cannot answer that?

A I would just have to guess.

Q It might have gone into the underground mining business had it not been associated with Freeman, is that right?

A Had they not been associated? I don't know that. All I can say is they would have made a mistake if they had tried it.

Q Are you aware of the fact that Carter Oil Company, an affiliate of Humble Refining Company, has gone into deeper mining in Illinois, is going into the deep mining business?

A Yes, sir, I am aware of that.

Q Are you familiar with the particular reserves they are developing?

A Yes, sir.

Q What is the seam thickness?

A About five feet.

* * * *

[1423] Q And it is a fact, is it not, that Humble, to your knowledge, has never been in the underground mining business?

[1424] A To my knowledge they have not been in the underground coal mining business.

Q So that would be one company that would be an exception, would it not, to your statement, if you want to call it an exception, that it is difficult if not impossible for someone inexperienced in underground mining to go into that business?

A I don't know that it is an exception yet, because, as you might say, the jury is still out.

Q But you do know that this company has contracts to supply Commonwealth Edison with three million tons a year at its Powertown Station?

A Yes, sir, I know that.

Q Are you familiar with the Inland Steel Mine?

A Yes, sir.

Q When was that developed?

A Perhaps starting in 1968, something like that, I believe.

Q Who developed that particular mine?

A Inland Steel's coal mining operation group.

Q When did they first go into the coal mining operations?

A Possibly 50 years ago.

Q Where was their mine located?

[1425] A Wheelwright, Kentucky.

Q Where is that?

A Wheelwright, Kentucky. That is in eastern Kentucky.

Q What part—

A In the United States.

Q Pardon me?

A I said eastern Kentucky, in the United States.

Q Do you know whether or not they brought their personnel from their eastern Kentucky operation to open up their Illinois mine?

A Yes, they did.

* * * *

[1427] Q Are you familiar with the Parton Coal Company?

[1428] A What is that?

Q Parton, P-a-r-t-o-n.

A No, I am not.

Q There are, are there not, smaller companies than Freeman in underground coal mining in Illinois?

A Certainly there are, because they are No. 1. If there are any more of them, they have to be smaller.

Q About how many would there be?

A I would guess five or six or seven companies.

Q How large an operation would you say an underground mining company would have to have in order to have the know-how to open up a new mine of, say, one million tons production a year?

A I don't know that there is a definite figure, but I would say it should be in the neighborhood of five million, four million tons plus, before they could support the proper staff to do the work.

Q When you say five million tons, you are not talking, are you, in terms of technical know-how? You are talking in terms of financial resources, aren't you?

A What I am trying to say is that it takes a certain amount of business to support a staff large enough to do your work. That is what I am trying to say.

Q My question was not clear. I am sorry. I [1429] wish you would apply this to United Electric. Assuming that you do have a large corporation already engaged in strip mining, about how large a company would they have to acquire in order to acquire the technical know-how to open up, say, a slope mine at Round Prairie?

A I understood your question and my answer was four to five million tons.

Q What is there about the extent of that operation, the four to five million tons, which is necessary to acquire the know-how to open up a deep mine?

A I will answer that again. In order to do business, which apparently you do not know too much about, you have to be able to support a staff. You have to be able to make money so you can have staff that has the knowledge. You can't have a dog hole and have sitting on the staff three or four vice presidents of engineering and maintenance, and so forth. You have to be big enough to have a staff that can support you.

* * * *

[1439] Q You did not attempt to acquire any reserves in LaSalle County?

A Where is LaSalle County? Orient me. I am not that familiar with this state. I am a newcomer here.

Q That is in the area of—

THE COURT: Indicate on the map to expedite it.

THE WITNESS: Show me about where it is.

BY MR. EISEN:

Q It is in central Illinois.

A Near what city?

Q Well, let me ask you this, Mr. Camicia. What counties in the state did you have your people explore in for coal reserves?

A My instructions—

MR. IRVING: Your Honor, I think it is unclear to me at any rate, and perhaps it is to the witness, too, whether Mr. Eisen is speaking of acquiring reserves for UEC or Freeman or both.

THE COURT: Would you specify, Mr. Eisen?

BY MR. EISEN:

Q For UEC.

A My instructions to my staff was to find any reserves they possibly could in the State of Illinois, Indiana, Missouri or any place else in the United States [1440] that could be stripped for UEC. We had a team that searched all over the country. I don't know which counties they went in, which counties they did not go in, but we looked at every possible area in Illinois where there are strip reserves that could be available.

Q What were your instructions to them insofar as the quality and quantity of reserves they should look for?

A I didn't even put any reservations on it. I just said find some coal that could be stripped, and then I would decide whether it was worth buying or not. Anything that can be stripped, just so it is black. That is really my instructions to them.

Q To whom did you give these instructions?

A I gave them to Burl—I can't remember all these guys' names now, but one was Burl Jensen, who is the company geologist. I gave the instructions to Peter—the chief engineer, Peter Spartan. I gave the instructions to Tom Latimer. I also gave instructions to three people in Freeman to help United Electric look for strip reserves. They were Jack Madsen, Bill Mullins and Tom—I can't remember his name, but he was an engineer with Freeman named Tom, an older fellow.

Q Did they ever report back to you any specific [1441] reserves that you can recall, any particular fields they found?

A Yes. They found a field in central West Virginia called, what I call, the LaRosa property. They had some potential of strippable reserves, but it was tied in to deep mine reserves, and the study of the overburden and the quality of the coal was such that you just couldn't make a profit of it, so we just let it go by the

boards. It is still sitting there if anybody wants to buy it.

Q Did they report any strip reserves to you in the State of Illinois?

A Only very small patches of contiguous reserves that we tried to get and in most cases were unsuccessful.

Q You did not have them look for any deep reserves?

A You asked me about UEC. Now you are asking me about Freeman?

Q While you were at UEC.

A I did not have UEC looking for deep mine reserves, no.

Q Where would you draw the line between a deep mine reserves, sir, and underground?

A Well, it depends on a lot of things, but in [1442] general you can say about a hundred feet. If the overburden is not solid rock. But if it is solid rock you couldn't even afford to go that high.

* * * *

[1444] Q Would you say that a man whose experience had been exclusively in deep mining could successfully run a strip company?

A After a short period of training, yes.

MR. EISEN: I have no further cross, your Honor.

THE COURT: All right. Any redirect?

MR. IRVING: Your Honor, may I have a moment to consult?

THE COURT: You may.

(There was a brief interruption, after which the following further proceedings were had herein, to-wit:)

MR. IRVING: Thank you, your Honor.

THE COURT: All right. You may proceed.

REDIRECT EXAMINATION

BY MR. IRVING:

Q Mr. Camicia, during the course of the cross examination, you referred occasionally to what you called a dog-hole mine.

Could you please define for us and for the Court what you mean by a "dog-hole."

A Well, it is a general term used by coal mining people, meaning a very small operation, employing perhaps less than 20 people, usually a family-run organization [1445] that produces up to, say, from 100 to 200 to 300 tons per day.

Q How long do these dog holes generally stay in operation, if you know?

A Usually a dog hole is good for maybe six months or a year. Then they get their house so dirty, they have to move rather than build a new house.

Q Could such a mining operation as you have described and defined as a dog hole support a modern long-term contract business in the coal industry?

A Oh, certainly not. Any customer that would consider a dog hole as a source of supply—well, they just couldn't do it. They may get it on a spot basis temporarily in an emergency, but they certainly wouldn't make a long-term contract with anybody, I don't think.

Q Sir, when you stated that there were, I believe, five to seven companies in Illinois who are deep miners smaller than Freeman, did that include any companies which you would consider to be dog-hole operations?

A No, sir. I wasn't thinking in those terms, no, sir.

MR. IRVING: We have no further questions, your Honor.

[1446] THE COURT: Any recross?

MR. EISEN: No, your Honor, except may the record show that there has been an extensive deposition with Mr. Camicia's testimony on some of the same subject matters.

THE COURT: All right. Thank you, sir. You are excused.

THE WITNESS: Thank you.

(Witness excused.)

THE COURT: You may call your next witness.

MR. KEMPF: Your Honor, can we have about a five-minute recess?

THE COURT: In other words, you want to recess until 2:00 o'clock?

MR. HEDLUND: Well, no, your Honor. If we could have about five minutes—

THE COURT: All right. We will take a five-minute recess.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

THE COURT: Are you ready to proceed?

MR. KEMPF: Yes, your Honor.

THE COURT: You may call your next witness.

* * * *

[1448] SAMUEL F. SHERWOOD,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your full name, sir, and spell your last name.

A Samuel F. Sherwood; S-h-e-r-w-o-o-d.

Q What is your home address, Mr. Sherwood?

A 1221 Golden Hill Drive, Indianapolis, Indiana.

Q By whom are you employed, sir?

A I am employed three ways. I am president of the Calvert Youngblood Coal Company. I operate an independent consulting firm by the name of S. F. Sherwood & Associates. More recently, I have become vice president of Empire Energy Corporation, which operates a small drift mine in Colorado.

Q Could you describe for us Calvert Youngblood Coal Company's operations.

A It is a strip mine operating about an 18-yard shovel, mining very high quality coal, thin seam, overburden running up to about 80 feet. The coal almost [1449] exclusively goes into the metallurgical market to make foundry coke.

Q How long have you been in the coal business, Mr. Sherwood?

A Well, I have been in the coal business all my life. My father started mining in Danville, Illinois, in 1918. After graduating from Harvard and serving four years during World War II in the Navy, I went into the coal business with my father, which by then had developed into the Stonefort Coal Mining Company, and worked for it until its sale to Peabody in 1966.

Q Could you please speak up a little louder so that all counsel can hear you.

A All right.

Q What was your position with Stonefort at the time it was sold to Peabody Coal Company?

A I was president of the corporation.

Q What properties was Stonefort operating at the time it was sold to Peabody?

A The company operated the Will Scarlet Mine in Saline and Williamson Counties, Illinois, which is in the southern Illinois freight district, and the Allendale Mine in Stark County, Illinois, which is in the [1450] Fulton-Peoria freight district.

Q Mr. Sherwood, did any of Stonefort's mines reach the end of their mine life while you were active in the company's management?

A Yes. Prior to the Allendale mine, we had a mine known as the Little John mine in Knox County, Illinois, just west of Peoria. It did reach the end of its reserves.

Q What, if any, marketing problems did the mine face as its reserves neared exhaustion?

A Well, we had a number of problems, most of them in keeping customers and finding replacements for those that were lost. The word got around that we were on our last few years. We had no success, obviously, in making any long-term contracts which were coming in with utilities. Even the regular year-to-year customers with which we had had good relations began to fall off. We really had to resort to lowering our price and struggling along as best we could, which gave our last few years a pretty tough financial situation.

[1451] Q Did this affect not only yourself but also your customers?

A Yes, yes. If we had had the reserves, we could have continued to service them. Instead, we could not.

Q Did you have any other mines which experienced similar difficulties?

A Well, a year or two later, our Sherwood-Templeton operation in Indiana, this mine approached the end of its reserve life. It had only a couple of years to go. In that case, with the experience of our Little John operation, we arranged—we made a sale eventually of that mine as a going property to Ayrshire Collieries which had adjacent reserves. They took over our customers, took over the mining operation and continued that operation. As it petered out, as the reserves that we had petered out, they just carried on with their own reserves, and they are still operating.

Q Was that a benefit both to that particular mine and to the customers in your opinion?

A I think so.

Q For what reasons?

A Well, they had a continued supply of coal from the same region. So much of the business, particularly in the utility field, is becoming long term. These [1452] utilities had the knowledge of where their coal was coming from, whereas in our situation prior to selling to Ayrshire, we just were unable to give them the confidence of continued supply that they would have liked.

Q You mentioned that at the time Stonefort was sold to Peabody, you were operating the Will Scarlet Mine in the southern Illinois freight district and the Allendale Mine in the Fulton-Peoria area.

Was the coal mined at Stonefort's Will Scarlet Mine in southern Illinois similar in its characteristics to that mined at the Allendale Mine in Fulton-Peoria?

A No, it wasn't. They were very dissimilar. The Will Scarlet coal was about 2,000 BTU's greater. It had very low moisture versus high moisture at Allendale. Its sulphur was different. The amount of ash and the flagging characteristics, fusion and all this were dissimilar.

Q Are these differences between the two coals a factor in marketing coal?

A Yes, they are. Practically any large customer or small customer, I presume, designs its boilers for the expected type of coal that it expects to burn. If [1453] they attempt to burn a dissimilar coal, they become inefficient and run into operating difficulties and generally have a bad time.

Q What would you estimate the number of boilers designed to burn coal, say, from both your Will Scarlet and Allendale Mines?

A Well, I doubt that there was too much similarity where we could sell one or the other coal. There was not too many similar boilers where they could burn it efficiently. You can burn anything; you can burn match sticks if you want to, but it isn't efficient.

Of course, we never really got to that very much because our freight rate districts were different and our natural markets were in different areas.

[1454] Q Where would the coal from, say, the Allendale mine be sold?

A It was sold practically exclusively in the immediate area of Peoria and west and north until you ran into the Mississippi River where barge competition denied much sales.

Q What about the coal from your Will Scarlett mine in southern Illinois, where was that sold?

A It was sold—we had one major contract with TVA. It went to the Shawnee plant down below Paducah. The balance of that coal went into Wisconsin, practically all into Wisconsin or even further north.

Q Mr. Sherwood, do you have any experience in mining coal by the underground method?

A No.

Q What has your experience been involved in in this time you have been in the coal business?

A Well, it has been exclusively in the stripping end of the business.

Q Did Stonefort Mining Company have any experience in deep mining?

A No.

Q What was their experience confined to?

A Pardon me?

[1455] Q What was their experience related to?

A Strictly strip mining. As I said, my father started out as one of the first strip miners in 1913. The organization had been exclusively strip mining ever since.

Q In your opinion, Mr. Sherwood, could Stinefort have successfully entered into the mining of coal by the underground method?

A No.

Q Why do you say that?

A Well, except for the product, about everything else you can imagine as far as operating is entirely dissimilar. The stripping is a question of moving overburden. Underground operations are making a hole in the ground. There is just no relation.

Q Mr. Sherwood, prior to the time that I contacted you with regard to this lawsuit, did anyone else contact you with regard to this suit?

A Yes. About a year and a half ago, Mr. Sims and Mr. Futterman came down to Indianapolis and talked with me.

Q Did they indicate to you why they wanted to talk to you?

A Well, they indicated that they understood I [1456] was familiar with the midwest coal industry, and they wanted to talk to me in regard to this case.

Q Did such a discussion occur?

A Yes. They spent, oh, about two hours, I guess, with me in my home.

Q Did you ever hear from them again after that discussion?

A Well, no, not until last fall sometime after they heard that you were going to ask me possibly to be a witness in this case. Then they called me, and later on, I believe it was Mr. Sims who came down and talked with me for a short while.

Q They came down a second time at that point?

A Yes.

MR. KEMPF: Your Honor, we have no further questions. Perhaps the Government has a few more today, however.

THE COURT: Can you complete your cross examination in two minutes, Mr. Cusack?

MR. CUSACK: I doubt, your Honor, whether I would be able to, even moving with alacrity.

THE COURT: All right. We will recess until 2:00 o'clock.

(Whereupon, the hearing in the above-entitled cause was recessed to 2:00 o'clock p.m., the same day and date.)

[1458]

* * * *

AFTERNOON SESSION 2:10 P.M.

* * * *

SAMUEL F. SHERWOOD,

called as a witness by the defendants herein, having been previously duly sworn, resumed the stand and was examined and testified further as follows:

CROSS EXAMINATION

BY MR. CUSACK:

* * * *

[1464] Q Would the tendency be dropping off because of the disappearance of the smaller size producers?

A No. They are probably the people who need it the most. It is the fact that a sales agent—you really don't need one in dealing with your major customers such as utilities because you make a deal for a long-term, and there it is. You don't need to have a person on the payroll just working off his shoe leather, which you used to have selling to dealers and domestic coal and small businesses which mostly have gone to gas and other fuels in the past ten years and more.

Q Is it a fair statement to say that you don't need a sales agent so much any more because there is a shortage of coal and there is a relative ease in the sale of coal?

A You need a sales person, but usually the sales

agencies charge so much a ton. This is not really a good way to—it isn't fair to the producer to pay the kind of brokerage fee that these people as a rule try to get.

* * * *

[1471] Q That was Stonefort that finished a number of capital improvements, had finished making a number of capital improvements, and that the future for Stonefort was bright in 1966 at the time of its acquisition by Peabody?

A We had made the capital improvements, and the future was bright, with the exception of the exact time of acquisition. The major improvement, a 60-yard dragline at Will Scarlet, wasn't putting out the yardage that we had expected, and we were not producing the coal we expected.

Q But you were reluctant, were you not, to sell Stonefort to Peabody?

A I wish we had gotten a better price.

Q Isn't it a fact that you told the Government you were reluctant to sell Stonefort to Peabody?

A The timing of it was poor. We had been going into a project to put the company in shape where it would be a good property to merge, sell or dispose of in some way. We had some reserves in Gallatin County, which were chiefly underground reserves. We had a bear by the tail there, awfully good, but we didn't see how we could finance them or felt we had the capacity to operate.

* * * *

[1474] Q Would it be nearly a half million dollars?

A If my memory serves me right, it was about a million dollars.

Q About a million dollars? The approximate net worth of the Stonefort Company when it was sold to Peabody was about $8 million, is that correct, sir?

A Seven or eight, yes.

Q Isn't it a fact, Mr. Sherwood, that there were plans at the Stonefort Coal Mining Company for Stonefort to develop the deep coal reserves at Shawneetown?

A We discussed the possibility many times and came to the conclusion that we, as I said earlier, neither had

the capabilities nor the financial ability to develop a mine of the size necessary to compete in today's market.

* * * *

[1478] Q We are familiar with that.

Is it true, is it not, Mr. Sherwood, based on your knowledge and experience in the coal mining industry in the midwest, that there have been a number of instances where underground coal reserves were later stripped, is that correct?

A In a way, usually—sometimes the reserves that were underground were maybe not counted as very economical underground reserves and deeper stripping made them available, where otherwise they wouldn't be there at all.

If you have a thin seam, they might be underground, but not really be viable reserves under present economic conditions, and deeper stripping equipment make them available.

On the other hand, there has been a lot of good stripping that was ruined by old works years ago.

Q Is it fair to say that, generally, strip coal reserves, or what is thought to be economically mineable strip coal reserves, have increased over a period of time with the development of larger stripping shovels and equipment?

A The reserves have been added to by this equipment. Of course, the shallower stripping has been going [1479] away on the other side. Probably—I don't have any statistics, but you might be adding by going a little deeper from 50 to 60 to 70 or 80, but as this is going on, you are eating up the cream in the 40 and 50 and 60 stuff. So, you would have to study everybody's records to see how things stand as of now. You are adding one end and taking up the other. The addition, in my opinion, is coming pretty close to the end.

THE COURT: Can both sides hear the witness?

MR. HEDLUND: I am having difficulty, your Honor.

THE COURT: Would you speak up a little, please.

THE WITNESS: Oh, yes, sir.

THE COURT: Thank you.

BY MR. CUSACK:

Q You stated, Mr. Sherwood, did you not, that the quality of the Will Scarlett and the Allendale mine coals was substantially different, is that correct?

A That is right.

Q Would that be on a wash basis?

A Yes. Both—well, the Allendale coal had to be washed, no question about that. The Will Scarlett coal in certain markets, probably only to TVA, could have been sold raw. As a matter of fact, for a few months, when we started the mine, we did sell, I think, 70,000 [1480] tons of raw coal to TVA because our preparation plant was not in operation.

* * * *

[1485] Q 133 is Will Scarlett.

My question, sir, is this: Isn't it true, based on your recollection and based on these documents, that the BTU rating of the washed coal at Allendale was [1486] approximately the same as the BTU rating of the washed coal at Will Scarlett?

MR. KEMPF: May I have that question read?

BY THE WITNESS:

A No, these are entirely different. As I said in my testimony this morning, there is a 2,000 BTU difference. Allendale has as received washed at 10,444. Except for the carbon here, Will Scarlett had 2,000 more, 12,470 and another one at 12,524 and another one at 12,496.

I think I was correct in saying there is a 2,000 BTU difference in the coals.

BY MR. CUSACK:

Q Would your testimony be that on a wash basis there was also a 2,000 BTU difference?

A Well, those are on a wash basis. That is exactly what it says: "As received."

You have been confused with the dry basis which has no relation to how you sell your coal or what a customer wants for it. He doesn't care about the dry basis because he is getting water and moisture.

Q Is it your testimony or your belief, Mr. Sherwood, that the coal mined at the Will Scarlett mine and the coal mined at the Allendale mine, even though being 2,000 difference in BTU's, could not be used by [1487] the same utility generating station?

A It might be possible that they could use it, but from an economic point of view, they would be very reluctant to. As I said earlier, depending upon—when a utility builds a plant or a large customer, they get some idea where, what region, what types of coal they expect to draw their fuel supply from over the years. They relate traditional freight rates, cost of transportation, coal qualities and coal values in different areas to get delivered cost for a million BTU's, and they design their plant with as narrow a range as possible to fit where they expect the coal to come from.

Q Mr. Sherwood, the evidence in this case shows that the plants of the Commonwealth Edison Company can take a coal with a minimum sulphur of 2.5 percent and a maximum sulphur of 5 percent, a minimum ash of 5 percent and a maximum ash of 17 percent, a minimum percentage moisture of 7 percent and a maximum of 22 percent, a minimum BTU of 9,400 and a maximum of 13,000.

Isn't it true that both the coals produced at the Allendale mine and the Will Scarlett mine would come within those ranges?

A Well, I don't have a table right in front of me, but—

* * * *

[1490] BY MR. CUSACK:

Q No, sir, it runs—

THE COURT: Let the witness finish his answer, Mr. Cusack, then you can ask him another question.

BY THE WITNESS:

A They could be. Either Will Scarlett or Allendale coal basically fit these specifications, but I think in taking Commonwealth Edison, you are taking a company that has a number of power stations built at different years, and they have this for each station. Undoubtedly

their operating people would try to channel a certain grade of coal, a certain quality of coal, to a certain station where it would most economically burn the best.

Another point of view is that they are such a big buyer, burning something like 15 million to 18 million tons a year, I think, that they just have to buy from more than one producing area in one grade of coal, because they just gobble up everything in one area, and if they wanted to go to Fulton-Peoria and get all the coal out of there, no one else would have any.

Q Commonwealth Edison does buy coal, does it not, from almost every producing district in the midwest?

A Yes.

• • • •

[1492]Q Mr. Sherwood, do you believe an Illinois coal mining producer with average net profits after taxes of over $3 million a year was in a better or in a worse position than Stonefort in going into underground mining?

A I don't know. That is a hard question to answer. I don't think you really have given enough basic facts.

Q Just on the basis of profitability of the two companies.

A You are saying one company has a net profit of $3 million?

Q Per year, sir.

A Per year? As against Stonefort?

Q Yes.

A I don't know that the profitability makes too much difference. The question is do you have the know-how to do it and on what scale are you going to have to learn.

Q Mr. Sherwood, does Stonefort ever attempt to acquire any strip coal reserves from any other coal producer?

A Well, we did in the Allendale situation. We took over a whole reserve area, which was rather limited, but something that we thought we could do with our used equipment.

[1493] Q You purchased this entire mine field, did you not, from Pittsburgh & Midway?

A We simply leased it. We assumed control of it,

what they had, and added to it as we saw fit and were able to.

Q And Allendale was a profitable operation, was it not?

A Yes. It had a rather limited life, and that was the reason that P & M turned it over to us. They claimed the reserves were seventeen million. We figured it a little more conservatively and came up with twelve million, which wouldn't support new equipment.

The reason we got together was that our Little John Mine was fading out. They heard of this. I think a year and a half to two years before Little John closed, they got in touch with us and said, "We have reserves that we don't think we can operate a mine on, put a mine on. You have a mine that is going out and some equipment nearby." They are only about 30 miles away.

Also their problem was that they had made—their leases were 20 year leases basically, and ten years had run on them. So there is only ten years to go.

We took that risk of renegotiating these leases, and, of course, in part of the ten years we would have mined them out.

[1494] But if we had to start in with a whole new plant, new shovel, new trucks, new tractor, new loading shovel, new preparation plant, we wouldn't have done it, and they wouldn't either. We brought in all our pit equipment. The only thing new we put in was the preparation plant.

Q Is it true Stonefort examined the property where the Banner mine was located in the early 1950's?

A We examined, as I recall, a portion of it that was controlled then by a fellow by the name of Cook. I had some discussions with him on it. We didn't examine it too much. I recall that back in the 30's, the late 30's, I guess, looking in the records and talking with my father, that it was worked on at that time and nothing came of it.

Q Is it fair to state, sir, that Stonefort had an opportunity to acquire the Banner property?

A I don't think we got far enough down the road with Mr. Cook to say we had a real opportunity. I believe he was running non-union. There were some prob-

lems with that property. They were rather limited reserves, very thin coal and along the Illinois River you are working behind a levee, a low drainage level. There is the risk of having a major seepage or, if something happened to that levee, bringing the whole Illinois River into your [1495] pit. That is a pretty troublesome risk.

* * * *

REDIRECT EXAMINATION

BY MR. KEMPF:

* * * *

[1503] Q You discussed the moving of the equipment from the Little John to the Allendale Mines during the course of your cross examination. When did this move occur?

A That was in the 1959-60—I can't remember. It was right in there.

Q Approximately a decade ago?

A Yes.

Q My question is would you expect that the figures you estimated concerning the cost of moving that equipment, if indeed the equipment were the same—I think you referred to a 35-yard shovel.

A Yes.

Q Assuming the moving of the same equipment, only of the same equipment, at the present time, would you expect that cost to be lower, higher or about the same?

A It would be much higher obviously, and not only that, but Allendale's was designed for a five or six hundred thousand ton a year operation, and really that is hardly a viable size mine. As things go, you would really have to start with a bigger machine, which would cost a lot more.

Q Was any part of that equipment moved by rail?

A A few of the major pieces. I think the dipper stick and bucket and a few pieces that were too big and [1504] awkward to move—we could have cut them up, but it would have been even worse. So we put them on flat cars, and we moved them. They were too big for the highway basically.

* * * *

SEP 26 1973
MICHAEL RODAK, JR., CLE

APPENDIX

Volume IV—Pages 1285-1718

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA

Appellant

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

	Page
Relevant Docket Entries	1
Complaint by the United States filed September 22, 1967	10
Excerpts from Deposition of Frank Nugent, taken September 10-11, 1968	18
Excerpts from Deposition of Nicholas T. Camicia, taken September 17, 1968	74
Excerpts from Deposition of John M. Morris, taken September 25 & October 1, 1968	99
Excerpts from Deposition of Frank Frederick Kolbe, taken October 10, 11, 15, 17, 18, 22, 24, 28, 29, 30, & 31, 1968	126
Excerpts from Deposition of Robert H. Inman, taken November 4, 1968	184
Excerpts from Deposition of Joseph C. Tabor, taken November 8, 1968	214
Excerpts from Deposition of Thomas J. Tarry, taken November 14-15, 1968	215

INDEX

	Page
Excerpts from Deposition of Burl Charles Jensen, taken November 21, 1968	291
Excerpts from Deposition of Thomas H. Latimer, taken December 3, 4, & 5, 1968	296
Excerpts from Deposition of Joseph J. Gallagher, taken December 12, 1968	320
Excerpt from Deposition of William L. Kurtz, taken December 12, 1968	323
Excerpts from Deposition of Martha Terleke, taken December 16, 1968	326
Excerpts from Deposition of Charles W. Stadell, taken December 16, 1968	332
Excerpts from Deposition of Harold K. Pedersen, taken December 18, 1968	339
Excerpt from Deposition of John P. Maguire, taken December 23, 1968	347
Excerpts from Deposition of B. H. Sloane, taken March 7, 1969	348
Excerpts from Deposition of Hugh E. Petersen, taken March 13, 1969	365
Excerpts from Deposition of John T. Middleton, taken March 13, 1969	380
Excerpts from Deposition of P. W. Dorrane, taken March 20, 1969	390
Excerpts from Deposition of Leon King, taken March 25, 1969	402
Excerpts from Deposition of Josephine C. Burton, taken April 14, 1969	413
Excerpts from Deposition of John P. Nix, taken April 14, 1969	417
Excerpts from Deposition of Aldo P. Brazzale, taken April 14, 1969	425
Excerpts from Deposition of Clarence V. Beck, taken April 16, 1969	429

INDEX

Page

Excerpts from Deposition of Winford C. Peterson, taken April 18, 1969 446

Excerpts from Deposition of Harold S. Walker, Jr., taken April 18, 1969 465

Excerpts from Deposition of William J. Stanley, taken April 24, 1969 486

Excerpts from Deposition of Fred E. Nicosin, taken May 15, 1969 498

Excerpt from Deposition of William D. Stiehl, taken May 20, 1969 536

Excerpts from Deposition of Thomas N. Ward, taken May 28, 1969 546

Excerpts from Deposition of Reuben A. Redard, taken June 10, 1969 568

Excerpts from Deposition of Harry B. Gaunt, taken June 13, 1969 576

Excerpts from Deposition of Gordon J. Morrison, taken June 20, 1969 596

Excerpts from Deposition of John Samuel Moore, taken June 20, 1969 614

Excerpts from Deposition of Bernard W. Schotters, taken June 23, 1969 636

Excerpts from Deposition of Leroy M. Abrahamson, taken June 26, 1969 650

Excerpts from Deposition of George P. Gamble, taken June 27, 1969 675

Excerpts from Deposition of Jack A. Simon, taken July 31, 1969 678

Excerpts from Deposition of John E. Organ, taken August 1, 1969 683

Excerpts from Deposition of John Paul Weir, taken August 5, 1969 692

Excerpts from Deposition of S. Smith Griswold, taken August 19, 1969 706

INDEX

	Page
Excerpts from Deposition of Bruce C. Netschert, taken August 20, 1969	731
Excerpts from Deposition of Abraham Gerber, taken August 21, 1969	764
Excerpts from Deposition of Peter O. Steiner, taken October 7-8, 1969	781
The Stipulated Testimony of C. C. Smith, dated December 4, 1968	832
The Stipulated Testimony of J. R. Sinclair, dated July 9, 1969, and attached exhibits 1-4	838
The Stipulated Testimony of George H. Shipley, dated July 10, 1969	848
The Stipulated Testimony of George B. Knecht, dated September 3, 1969, and attached exhibits 1-10	851
The Stipulated Testimony of David G. Hemminger, dated September 17, 1969	869
The Stipulated Testimony of John Sant, dated September 17, 1969	870
Excerpts from Transcript of Proceedings before Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, on October 3, 1969	872
Motion of Frank F. Kolbe to be excused from testifying at trial, and attached letter dated March 4, 1970	875
Defendants' Proposed Findings of Fact and Conclusions of Law filed October 27, 1970	880
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson, United States District Judge for the Northern District of Illinois, Eastern Division, commencing March 30, 1970:	
Appearances	1017
Testimony of Jack A. Simon	
—cross	1018
—redirect	1037
—direct	1038

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on March 31, 1970:	
Appearances	1044
Testimony of John M. Morris	
—direct	1046
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 1, 1970:	
Appearances	1092
Testimony of John M. Morris (resumed)	
—cross	1093
Testimony of Louis R. Tomey	
—direct	1105
—cross	1116
—redirect	1128
—recross	1132
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 2, 1970:	
Appearances	1134
Testimony of John M. Morris (resumed)	
—cross	1135
—recross	1164
Testimony of Reuben Thorson	
—direct	1164
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 3, 1970 :	
Appearances	1172
Testimony of Victor H. Wood	
—direct	1173
—cross	1179
—redirect	1188
—recross	1192
Testimony of A. H. Davis	
—direct	1196
—cross	1206

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 6, 1970:

Appearances ____ 1219

Testimony of A. H. Davis (resumed)

—cross ____ 1219
—redirect ____ 1227
—recross ____ 1229

Testimony of Ernest B. Tremmel

—direct ____ 1229
—cross ____ 1250

Testimony of Reuben Thorson

—cross ____ 1255

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 7, 1970:

Appearances ____ 1262

Testimony of Robert W. Steele

—direct ____ 1263
—cross ____ 1269
—redirect ____ 1279

Testimony of Thomas H. Latimer

—direct ____ 1282
—cross ____ 1284

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 8, 1970:

Appearances ____ 1289

Testimony of E. C. Hill

—direct ____ 1290
—cross ____ 1305

Testimony of Richard Drollinger

—direct ____ 1314

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 9, 1970:	
Appearances	1328
Testimony of George Gamble	
—direct	1329
—cross	1349
—recross	1350
Testimony of Thomas Latimer (resumed)	
—cross	1351
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 13, 1970:	
Appearances	1354
Testimony of Nicholas T. Camicia	
—direct	1355
—cross	1362
—redirect	1370
Testimony of Samuel F. Sherwood	
—direct	1372
—cross	1377
—redirect	1384
Testimony of Norman W. Moser	
—direct	1385
—cross	1391
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 14, 1970:	
Appearances	1398
Testimony of Norman W. Moser (resumed)	
—cross	1399
—redirect	1402
Testimony of Gordon R. Corey	
—direct	1404
—cross	1421
—redirect	1443
—recross	1444
—redirect	1446

INDEX

Page

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robinson on April 14, 1970:—Continued

Testimony of John D. Ames

—direct ____ 1447
—cross ____ 1452

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 15, 1970:

Appearances ____ 1456

Testimony of Daric N. Miller

—direct ____ 1457
—cross ____ 1463

Testimony of Frank Nugent

—direct ____ 1468

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 16, 1970:

Appearances ____ 1487

Testimony of Hollie Hopper

—direct ____ 1488
—cross ____ 1494
—redirect ____ 1509
—recross ____ 1514

Testimony of Frank Nugent (resumed)

—direct ____ 1515
—cross ____ 1529
—redirect ____ 1538

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 17, 1970:

Appearances ____ 1540

Testimony of Thomas L. Craig

—direct ____ 1541
—cross ____ 1553
—redirect ____ 1557

Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:

Appearances ____ 1561

INDEX

	Page
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 20, 1970:—Continued	
Testimony of Peter O. Steiner	
—direct	1562
Testimony of Robert H. Quig	
—direct	1593
—cross	1598
—redirect	1599
Testimony of Peter O. Steiner (resumed)	
—direct	1601
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 21, 1970:	
Appearances	1630
Testimony of Peter O. Steiner (resumed)	
—cross	1631
—redirect	1672
—recross	1677
Excerpts from Transcript of Proceedings held before the Hon. Edwin A. Robson on April 22, 1970:	
Appearances	1678
Testimony of James M. Folson	
—direct	1681
—cross	1695
—redirect	1711
*Decision on the Merits entered by the District Court on April 13, 1972	J.S. 1a
Notice of Appeal to the Supreme Court by the United States dated June 7, 1972	1717
Order of the Supreme Court noting probable jurisdiction, dated December 11, 1972	1718

* Not reprinted in Joint Appendix. Citation is to appendix of Jurisdictional Statement.

[1507] NORMAN W. MOSER,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KEMPF:

Q Please state your full name, sir, and spell your last name.

A Norman W. Moser; M-o-s-e-r.

Q What is your home address, Mr. Moser?

A 440 North 22nd Street, LaCrosse, Wisconsin.

Q By whom are you employed, sir?

A I am employed by the Dairyland Power Cooperative with offices at LaCrosse, Wisconsin.

[1508] Q What position do you hold with Dairyland Power Cooperative, Mr. Moser?

A I am chief engineer.

Q Do you have anything to do with Dairyland Power Cooperative's power production activities?

A I am in charge of power production for Dairyland.

Q How long have you been with Dairyland Power Cooperative?

A I started with Dairyland Power Cooperative as a turbine operator in Genoa Plant 1 in 1941. I was transferred to the general office in 1945 and became chief engineer in 1951. However, I have been in charge of power production since 1945.

Q In your capacities both in charge of power production and as the company's chief engineer, have you taken an active participation in the company's plant construction and fuel procurement activities?

A Yes, I have.

Q Would you briefly describe for us the general area served by Dairyland Power Cooperative?

A We serve the rural areas in western Wisconsin, the northwestern tip of Illinois, the southeastern portion of Minnesota and the northeastern portion of Iowa.

[1509] Q Mr. Moser, I am going to hand you what has been received in evidence as Defendants' Exhibit

145. This is a map entitled "Service Area, Dairyland Power Cooperative, LaCrosse, Wisconsin," as of June 1, 1968.

If you would look at that, please, tell me does that accurately portray the specific service area served by Dairyland Power Cooperative?

A Yes, it does.

Q What electrical generating facilities does Dairyland Power Cooperative have, Mr. Moser?

A Well, we have three generating stations on the Mississippi River, one at Cassville, Wisconsin, that has a capacity of about 52,000 kilowatts. We have a station at Alma, Wisconsin, that has a capacity of 205,000 kilowatts. At Genoa, Wisconsin, we have our original steam generating station of 14,000 kilowatts, and our two newest generating stations, a nuclear generating station of 60,000 kilowatts, and a new coal-burning station that went into operation last year of 350,000 kilowatts.

In addition, we have diesel stations, one diesel station at Twin Lakes, Minnesota, of 10,000 kilowatts, and one at Chippewa Falls, Wisconsin, of 3,200 kilowatts, and a hydro station on the Flambeau [1510] River near Ladysmith, Wisconsin, of 20,000 kilowatts.

Q From whom does Dairyland Power Cooperative secure the coal which is burned at its coal-fired generating stations?

A Well, since our plants are on the Mississippi River, we secure the coal from the Belleville area of Illinois as a general rule. There are exceptions of receiving coal in small amounts from other areas along the river.

[1511] Q You indicated that you at some time last year brought in your newest coal-fired station at Genoa. When did you bring that into operation last year?

A That station went into operation in July of 1969.

Q Did this materially increase your coal requirements?

A By a substantial amount.

Q What did that lead to in terms of acquiring additional coal?

A In acquiring additional coal last year, that coupled with some of the problems in the Belleville area, required us to get into the West Kentucky fields a little more than we had in the past. There were several factors.

First, the river was in flood stage, putting locks out of operation for about one month last year that thoroughly fouled up our shipping schedule. We must receive all of our coal on the river during the time it is open, about seven months of the year. One of these months was lost due to flooding.

With our additional requirements immediately behind the flooding of the upper river, the mines in the Belleville area were subject to problems that were weather-induced, flooding in this area, in the Belleville [1512] area. So, this resulted in us looking in particularly the West Kentucky fields for additional coal.

Q How was that coal shipped to you?

A It was shipped by barge. We have no facilities for handling rail coal in large quantities.

Q Are you encountering the same weather difficulties this year? I realize the season is not substantially under way, but thus far this year, have you encountered these difficulties?

A No. The navigation season looks like it is opening in a much better note than it did a year ago, because at this time last year, we were approaching the flood stage. At the present time, there is no indicated flood on the upper Mississippi River.

Q As a result, have you increased, again, your shipments of coal from the Belleville district?

A Yes. The coal is coming fairly well on schedule this year.

Q I would now like to show you what has been received in evidence as Government Exhibit 90, a table referred to as "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation," showing destination points. This particular exhibit is for the year 1967.

[1513] There are similar exhibits designated as Government Exhibits 88 and 90 which cover much the same information but which are for the years 1965 and 1966.

THE COURT: You said 88 and 90. Do you mean 89?

MR. KEMPF: Yes, 88 and 89. I am sorry.

THE COURT: All right.

MR. KEMPF: This is 90.

THE COURT: Yes.

MR. KEMPF: If I may approach the witness, your Honor—

THE COURT: You may.

BY MR. KEMPF:

Q I would now hand you this exhibit and refer you to page 2 thereof.

The first entry on page 2 thereof refers to Dairyland Power Cooperative. It indicates that Dairyland Power Cooperative has received shipments at, I believe, both its Alma and Cassville Stations from Freeman and United Electric.

My question is, do you consider Freeman and United Electric to be competitive for the business of those stations.

A I do not consider them directly competitive. The product we get from Freeman is dust. This is shipped [1514] as a by-product to us.

We do have limits in how much we can receive of this material.

Q What do you receive from United Electric?

A We receive the wash screenings from the Fidelity Mine.

[1515] Q What type of purchasing system does Dairyland Power follow in securing its coal, Mr. Moser?

A Most of our coal is on long-term contracts.

Q Of how long a duration are these?

A These are from 10 to 20 years.

Q Why do you secure your coal under these type of arrangements?

A Well, because of our substantial investment in power plants, why, we must have some assurance of our supply.

Q What restrictions, if any, are there with respect to the coal which can be burned in the boilers operated by Dairyland Power Cooperative?

A Well, while we request design flexibility as much as possible, the modern boilers do have to be designed around the specification of coal. This deviation from this coal begins to cause operating problems such as loss of efficiency or even inability to keep the unit either at its rated load or on the line at all.

Q What about your newest station that you described that came into operation last summer at Genoa? Does that have a narrower, a wider or about the same range of specification regarding coal characteristics as your older plants have?

[1516] A As these units get larger and more sophisticated, their ability to handle a range of coal becomes narrower.

Q Have you had any actual experiences where the use of a type of coal which did not meet the specifications of your boilers led to difficulties such as you have described?

A In this new unit, as I mentioned, we had to go to some west Kentucky fields that we were not so sure of the quality of the coal. As a result, we loaded this new unit with slag to the extent that it was off the line, and we had to get in and remove the slag. The first attempt at this was done with jack hammers. However, this was not too effective. So, finally, we used the jack hammers to drill holes and used dynamite to blast the slag out. We estimated between 40 and 50 tons of slag accumulated in this boiler.

Q I am sorry, I didn't pick up the tonnage amount.

THE COURT: Read the answer.

MR. KEMPF: Just the latter portion.

THE COURT: Just the last part.

(Record read by the reporter.)

BY MR. KEMPF:

Q 40 and 50 tons of slag?

A Yes.

[1517] Q You mentioned that of your two newest facilities, one is the coal-powered station at Genoa, to which we have just been referring, and the other you indicated also at Genoa is your nuclear-powered station.

Has Dairyland Power Cooperative made any decision as to what fuel will be used at the next station you add to your system?

A No, we haven't decided what fuel will be used in the next station. We are continually comparing nuclear coal. Unfortunately, we have to look at the air

pollution problems caused by coal. We are looking at gas and oil as possible alternate fuels.

Q Are any of the coal-fired stations which Dairyland Power operates, Mr. Moser, near metropolitan areas?

A No, they are not. You wouldn't think that we would have the problem of air pollution, but we have been sued at our Alma station by three farmers in the area. This suit has led to a landmark decision by the Wisconsin Supreme Court, indicating that we are a nuisance and that the farmers in the area have the right to sue us for damages.

Q This is damage caused by what?

[1518] A This damage, the suit was based on damage caused by sulphur oxide emisions.

[1519] Q And what was the damage done to? The farmers individually?

A The damage was done primarily to the alfalfa crops, some of the trees on the farm, and some damage to the farm buildings themselves.

Q When did this decision come down?

A This decision came down in December of 1969.

Q Do you and other executives of Dairyland Power take an active interest in the subject of the regulation of air pollution?

A Yes, very much so. Our general manager, John Madgett, was on the President's Environmental Committee, and at the present time the State of Wisconsin is in the process of establishing air pollution rules. I have attended a number of those hearings.

In addition to that you might say I am quite a regular visitor to the City Council of Alma, Wisconsin, and, well, just last week I had to face some of the teach-in people that are getting ready for the environmental teach-in next week.

Q Will the subject of air pollution have any effect on the fuel purchasing decisions of Dairyland Power Cooperative?

A It necessarily will have to, because the [1520] regulations are coming. We in Wisconsin do not know exactly what they will be. We have a general idea that the proposed rules are very strict on particulate emission.

As yet they have not established a criteria for gaseous emissions.

Q Are the people in the rural areas you serve concerned with air pollution?

A They definitely are. They feel that they have clean air now and they intend to keep it that way.

Q As a result of the impact of the air pollution regulations do you think this may affect your fuel purchasing in the future?

A Yes. We have to look at ways of abating the pollution in existing plants and in future plants. It will have a definite bearing on the design of the fuel that we burn. The regulations are dictating to us to a certain extent the type of fuel that we will be able to burn.

[1521] Q Mr. Moser, what effect, if any, does the combined ownership of United Electric and Freeman by General Dynamics have on the competition for Dairyland Power Cooperatives' fuel business?

A We do not feel that it has any detrimental effects, primarily because we use different types of coal from each of the companies. In our long-term contracts, we are not sure and United Electric is not sure of their reserves, and we feel that in the competitive field of coal, strong companies are better than a great number of companies.

MR. KEMPF: No further questions at this time.

THE COURT: You may cross examine.

CROSS EXAMINATION

BY MR. FUTTERMAN:

Q Mr. Moser, you stated on your direct examination that your company will be forced to consider other types of fuels in its future decisions. At the present time is Dairyland Power purchasing any interruptible gas?

A Yes.

Q And you confine those purchases to the summer months, do you not?

A Yes. These gas purchases are for the small [1522] diesel station that is less than 1 percent of our total generation.

Q You could not afford to buy gas at the firm rate, could you?

A In view of the air pollution, we do not know all of the answers yet. We may have to buy gas at firm rate.

Q Didn't you tell me the other day when I spoke to you on the phone that the Wisconsin Public Utility Commission told your company it should not ask the gas company to increase the supply of natural gas being supplied your company because of the shortage of natural gas in Wisconsin?

A We received a letter from the Public Service Commission saying in effect that until further gas was allocated to Wisconsin, the new pipeline would likely not be built.

Q So as of the present time you would not be able to increase the supply of interruptible gas or contract to purchase firm rate gas to fuel any future generating stations, is that correct?

A The only place we have a gas line now is in the diesel station.

Q Is that a peaking station, sir?

A It is used for peaking largely.

• • • •

[1524] Q You testified you also would consider oil. Are you presently burning oil at stations other than your diesel station?

A Only light-off oil. We are not burning any of the heavy oils.

Q Light-off oil is not used for purposes of generating electricity, is that correct?

A No, it is not.

Q At the present time oil is not priced competitive with coal for the purpose of generating electricity within your system, is it?

A On similar equipment we still have to consider all of the factors of meeting air pollution control regulations, particularly in existing units that are very expensive to put additional equipment on, and in the case of sulphur emissions, why we are not to the point that there is equipment that can be installed that will work satisfactorily to our knowledge.

Q You are experimenting at the present time. Are you negotiating with Foster-Wheeler Company at the present time to install some equipment which may be designed for the purpose of controlling SO_2 emissions?

A We are negotiating to enter into a research project with the Foster-Wheeler Company on the process [1525] that is as of yet untried, and Foster-Wheeler has asked to work on one of our units, and we are very happy to work with them in the hope that we will achieve a breakthrough in the recovery of the sulphur oxide gases.

• • • •

[1529] Q (By Mr. Futterman) When you talk about the air pollution problems your company has had, isn't it true that until the very recent past, your generating facilities did not have electrostatic precipitators on them?

A The only electrostatic precipitator we have at the present time is the new unit at the Genoa Station, the 350,000 megawatt unit.

Q Isn't it true that most of the large utilities have had electrostatic precipitators on their units for some time?

A They have on their larger units. The smaller size, such as we have at Alma, for instance—it has not been the common practice in an area such as the Alma plant is located into have electrostatic precipitators. They are equipped with mechanical precipitators. They will not meet the proposed air pollution control regulations of the State of Wisconsin with mechanical precipitators.

[1530] Q Would they meet these regulations with electrostatic precipitators?

A They would, provided we know the sulphur content of the coal, because an electrostatic precipitator has to be designed to a certain extent around the sulphur content of the coal. If we would go to a low sulphur coal at the new station at Genoa, the electrostatic precipitator would lose enough of its efficiency to cause a particulate problem.

Q That is because with low sulphur coal you have a greater proportion of particulate matter than you do with the higher sulphur coal?

A No. It is a matter of ionization of the flue gas.

Without the sulphur dioxide present, the ionization does not occur as readily as it does with the sulphur dioxide present, so the two problems are interrelated.

Q Mr. Moser, when you are receiving a barge load of coal, how do you determine which of your stations that barge load should be assigned to?

A To some extent we delegate this to the people that handle our shipments. Generally speaking, we do not designate, except in some cases, the coal that we would like to go to one station.

• • • •

[1534] Q What percentage of the coal that your company is currently receiving would you estimate is purchased on the spot market?

A My estimation now would be about 40 percent.

Q And that coal comes from the Belleville district, the southern freight rate district, and west Kentucky, does it not?

A Primarily west Kentucky.

Q In the past you have purchased some coal from Fulton County, have you not?

A Very small amount.

Q In the event that you would have trouble satisfying your coal requirements from Belleville freight district, from the southern freight district and from west Kentucky, would you consider the possibility of purchasing coal from the Fulton-Peoria freight rate district?

A Purchasing coal in the Fulton County area has been a rather difficult thing for us to accomplish. It is a long river haul. We do not have the rail handling facilities. As I say, in the past we have purchased some of this coal, and it has given us some operating problems.

• • • •

[1540] Q Once having decided the point from which or the coal field from which the coal for this new station would originate, would you then design the boiler to accommodate that kind of coal or coals if more than one field is involved?

A We would try to get as much range as we could in there, but we would have to specify the coal that we

expected to get for this new unit and then request as big a range as we could talk the boiler manufacturers into bidding on.

As I mentioned earlier, the larger and more sophisticated units are getting narrower in their range of coal burning.

Q Mr. Moser, isn't it a fact that Freeman and United Electric are currently supplying coal which is consumed in both your Alma and Genoa generating stations?

A Yes.

Q Isn't it true, also, that Freeman has the option of furnishing this coal from any of its southern Illinois mines?

A The contract with Freeman is for the dust. I believe it lists three mines, as I recall, three or four. I am not sure which, but the contract does call for a minus-10 pulverizer mix or a dust product.

[1541] Q At the present time, do both United Electric and Freeman salesmen call on your company?

A Yes.

Q Isn't it a fact, Mr. Moser, that the price of the dust is determined by its BTU content?

A No. These contracts, of course, were entered into some time ago. At that time—and an escalation has changed these, the relationship. But at the time we entered into the contract for the dust, it was our lowest BTU cost, and no other supplier would attempt to meet it.

Q That is not true today, though, is that correct?

A I am not sure if that is true today because of the escalations that have gone into effect, because the escalations for labor in deep mines have been more. There has also been some freight increases.

Q Isn't it true that at the present time, you are receiving coal from the United Electric Fidelity mine with a BTU value of 11,400 and a cheaper delivered cost than the dust with the same BTU value that originates in the Freeman mines?

A That is possible that that has crossed. I haven't checked that yet this year or last, but it is [1542] possible that that has crossed with the frieght increase. They are both on long-term contracts with escalation. The es-

calation on deep mines has been more for labor. Since the southern Illinois freight rate is greater, the freight rate increase has been more than some of the Belleville increases.

[1543] Q Isn't it true that you are receiving coal screenings from southern Illinois at a delivery cost which is cheaper per BTU basis, per million BTU basis, than the dust received from the Freeman Mines in the southern freight rate district?

A That might have been for the dog-hole coal that we received later. I don't believe we are receiving any coal at the present time on that basis from southern Illinois.

Q Mr. Moser, isn't it true that the screenings and the dust are consumed in the same facilities?

A Yes. They are mixed before they go into our facilities.

Q When the screenings are pulverized, they go into the boiler in the same form as the dust, do they not?

A Yes. They are pulverized together.

Q For every ton of dust that you consume, that means that you do not consume a ton of screenings, is that correct?

A Yes. Up to the limit that we can receive and handle and mix the dust, which I have prescribed an arbitrary limit of approximately 10 percent, yes.

Q The dust which your company consumes, that is delivered to you on barges, is it not?

[1544] A Yes.

Q All the screenings which you purchase are delivered on barges, are they not?

A Yes.

Q The dust and the screenings are used for the same purposes, to generate electricity, is that right?

A Yes.

Q Mr. Moser, in regard to your testimony concerning the possibility of using Western coal for the purpose of generating electricity, didn't you tell me that you thought there might be a shortage of railroad cars which could be utilized to move coal to the Midwest markets from the West?

A That is a problem that I think we might have at the present time in transporting this coal. I have not explored that to the extent of being told solidly this. My only contact with the railroad people were before the merger of the Great Northern and the Burlington was in effect. They said, "We will talk about that after the merger." I haven't made the move and neither have they to further discuss it.

• • • •

[1549]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; AND FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,
Tuesday, April 14, 1970,
10:30 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,
appeared for Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,
appeared for Defendants.

ALSO PRESENT:

DR. PETER STEINER.

• • • •

[1554] NORMAN W. MOSER,

called as a witness by the defendants herein, having been previously duly sworn, resumed the stand and testified further as follows:

CROSS EXAMINATION (continued)

BY MR. FUTTERMAN:

• • • •

[1564] Q Mr. Moser, on your direct examination, you stated that you were not sure and United Electric is not sure of their reserves. What did you mean by that?

A The last time we requested United Electric to extend the period of our long-term contract, they put in a provision on the last two years of the contract, "Subject to availability of the coal."

Q Did you examine United Electric's reserves books at that time?

A No, we did not examine their books.

Q Has United Electric ever offered to supply you with coal from the McDonaugh-Schuyler County area in Illinois?

A No, they have not.

Q If I were to suggest to you that the coal in the McDonaugh-Schuyler County area is a better quality coal than the Fulton-Peoria coal, would you be interested in purchasing it?

MR. KEMPF: I am going to object unless the witness knows where the McDonaugh-Schuyler area is. I do not think Mr. Futterman has laid a proper foundation.

BY MR. FUTTERMAN:

Q Do you know where that area is?

A No, I am not aware.

[1565] Q Mr. Moser, I direct your attention to what has been received in evidence as Government Exhibit Nugent Deposition Exhibit 38, and I point on the map to the McDonaugh-Schuyler County area. If you would like to come over and take a look at it, you can.

Do you have my question, sir?

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A It is possible. However, from looking at the map, it appears that there would be a transportation problem, that this would have to go down probably the Illinois River and back up the Mississippi River.

I know of no loading docks in that area on the Mississippi River or the ability to get it over there.

BY MR. FUTTERMAN:

Q Do you think it would cost more money to transport coal from that area in the manner you have just described than it is currently costing you to transport coal from west Kentucky to your generating stations?

A I would expect so.

Q You testified on your direct examination that you rely on the Belleville district for substantial tonnages of coal, is that correct?

A Yes.

[1566] Q I should like you to assume that one of your suppliers in the Belleville district has undeveloped reserves in that freight rate district, and assume further that the supplier is controlled by a large company which is not permitting the supplier to develop these Belleville reserves to their fullest potential. Would that be adverse to your company?

MR. KEMPF: I object, your Honor. Again this is similar to the questions I have objected to before. I think again the assumption is based upon facts which are not in evidence. I have no objection if he wishes to reframe it in terms of a hypothetical question, but in the terms of the question, that is, based upon assumptions on the record, I do not think there is any evidence to that effect.

THE COURT: Is there anything in the record to that effect?

MR. FUTTERMAN: Your Honor, I believe I did phrase it in the form of a hypothetical question. I think the record clearly shows that United Electric has reserves in the Belleville freight rate district and these reserves are not being developed at the present time.

I think there has been testimony in the record that these reserves may be developed at a future date.

[1567] MR. KEMPF: There is evidence of that, but Mr. Futterman's characterization of the reasons for that are part of his question.

THE COURT: Read the question.

Q (Read by the Reporter.)

THE COURT: He may answer.

BY THE WITNESS:

A Based on an assumption that reserves are not being developed, it would be adverse to our company.

BY MR. FUTTERMAN:

Q Mr. Moser, do you know that there is a coal unloading dock at Warsaw on the Mississippi River just west of the McDonough-Schuyler County area, and that this dock is served by the Toledo, Peoria & Western Railroad?

A We have never used this dock. I am not fully aware of its capability.

Q You have testified that you have had active participation in plant construction and fuel procurement and because of the substantial investment in power plants you need the assurance of a supply which is provided by long-term contract.

Have you participated in the negotiations of coal contracts?

[1568] A Yes, I have.

* * * *

Q Isn't it true that pursuant to the contract with United Electric, Dairyland Power Cooperative may have coal consigned to its Alma, Cassville and/or Genoa [1569] stations?

A Yes.

Q Mr. Moser, isn't it true that the price which you pay for coal may be renegotiated each January under the terms of that contract?

A I believe there is that provision in that contract. We usually have a provision for some renegotiation. However, we also have the escalation provisions in all of these contracts, which are tied to supplies and to labor cost.

[1570] Q Is it not true that if the parties fail to reach agreement with regard to this price negotiation, the contract is then cancelled for the succeeding 12 months and is again subject to price renegotiation the following January?

A That could be a provision. I haven't read that contract that recently.

Q Would that be a typical kind of a provision in a long-term contract?

A We have had provisions that the price was subject to negotiation or subject to negotiation if price did not meet substantial competition. Now, I am not sure if that is in the present United Electric contract or not, that provision.

Q Mr. Moser, at the present time are Freeman and United Electric supplying the Genoa station?

A Yes.

Q Did you ever have any conversations with any officers of the defendants, that is either Freeman or United Electric, in regard to this case?

A With the officers? I believe not.

Q Did you have any conversations with any representatives of the defendants in this case?

A We have had some conversations with the counsel.

* * * *

[1573] REDIRECT EXAMINATION

BY MR. KEMPF:

Q Mr. Moser, during the course of your cross examination by Mr. Futterman, he asked you a number of questions about your developmental nuclear station at the Genoa location. Do you consider that the company's participation in that developmental project has been a benefit to the company?

A Yes, it has, because we have developed nuclear capability in operation so that we are in a position to consider seriously a nuclear station in our next expansion.

Q Have you made any preliminary cost projections comparing the cost of fossil as opposed to nuclear for your next station?

A We participated in a study with the other power cooperatives in the area. I believe that study was completed about a year ago for a nuclear station to be constructed by, I believe it was, five power cooperatives in the area.

Q Did the study indicate that it would be more attractive from an economic standpoint to build a nuclear or fossil plant?

A From an economic standpoint it looked like the 500 megawatt nuclear station was, from an [1574] economic standpoint based on that study.

Q During your cross examination yesterday you referred to both Western coal and Western lignite. I take it these are two distinct and different things to which you have looked?

A Yes, the lignite that we tried was a North Dakota lignite that was a small quantity tried in the unit.

The Western coal we considered was a subtuminous from either Wyoming or Montana.

Q This morning you indicated that for a comparably-sized fossil unit the cost of your hydro station in terms of capital cost exceeded the cost of a comparably-sized fossil unit, coal unit.

My question is, if you compared the operating costs of the two, which would be the higher?

A The operating costs of a fossil-fired unit are much higher than the hydro costs.

Q If you then took and combined both the operating and the capital cost, what would be the comparison between your hydro station and your fossil station, specifically your older fossil stations which are comparable size?

A Our hydro station has the lowest over-all cost.

* * * *

[1575] Q You indicated that you had spoken with Mr. Futterman last week. Had you spoken to him on prior occasions also in connection with this case?

[1576] A Yes, I believe a week or two earlier I also had a telephone conversation with Mr. Futterman.

Q Would you describe that as a lengthy or short conversation?

A I would say it was the greater part of an hour.

Q Mr. Futterman posed a question to you based on a number of assumptions. He asked you to assume that a company had some undeveloped deep reserves and that the parent company had not developed them. I have a somewhat different but somewhat similar question to pose to you.

My question is, I want you to assume that a supplier with whom you have been dealing is a strip mine operator and has no experience or expertise in operating a deep mine. If that supplier came to you and indicated that notwithstanding its lack of experience and expertise in deep mining it would like to open some deep coal reserves and sell them to you on a long-term contract, what would your reaction as a coal purchaser be?

A My first reaction would be to want to see his deep mining capability. If he had only mined strip in the past, I would have serious doubts about his capability of mining deep coal.

* * * *

[1580] GORDON R. COREY,

called as a witness on behalf of the defendants, having been first duly sworn, was examined and testified as follows:

THE COURT: Mr. Corey was one of my experts in the electrical equipment cases.

THE WITNESS: Thank you.

THE COURT: It is nice seeing you. You may proceed. I don't know how good he is on coal. You may proceed.

MR. HEDLUND: We will endeavor to find out, your Honor.

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please state your name and present occupation?

A Gordon R. Corey, Chairman of the Finance Committee of Commonwealth Edison Company.

Q Mr. Corey, how long have you held the position of Chairman of the Finance Committee?

[1581] A Four or five years, I guess. I have been in charge of that at the Edison Company for about, nearly ten years.

Q Have you been a director for the same period of Commonwealth Edison?

A Yes.

Q What, briefly, are your duties and responsibilities as chairman of the finance committee?

A In general charge of the corporate financial, purchasing, legal and rate making activities of the company as well as treasury and accounting.

Q Would contract activities also come within your responsibilities?

A Yes.

Q Among the purchasing activities for which you are responsible, is the purchasing of fuel included therein?

A Yes.

Q Are you a director of any other company?

A Yes, I am a director of the Continental Illinois Bank and its holding company, Conill Corporation, and I have been proposed as a director for Inland Steel Company.

[1582] Q Would you please give me a brief summary of your educational background?

A I have a Bachelor's degree from the University of Wisconsin, an M.B.A. degree from Northwestern University. I am a Certified Public Accountant in Illinois.

Q Could you tell me how long you have been with Commonwealth Edison Company?

A Since 1939 with Commonwealth Edison or Commonwealth Edison subsidiaries.

Q Is Commonwealth Edison an investor-owned public utility?

A Yes.

Q Do you know how it ranks in size among investor-owned public utilities in the United States?

A Well, it is second or third, depending on how you measure it. In terms of kilowatt hour sales, I believe it is No. 3.

Q Tell me approximately how large the revenues of Commonwealth Edison were in 1969?

A Something like $750 million.

Q What about the assets of the company, just generally again?

A Net $2.5 billion.

[1583] That is net $2.5 billion?

A Yes.

MR. CUSACK: The Government objects, your Honor. All this information is in Commonwealth Edison's annual report for 1969, which is in evidence as Defendants' Exhibit 90.

MR. HEDLUND: I am not going to go into detail on this.

THE COURT: All right. Let's not be repetitious.

BY MR. HEDLUND:

Q Could you describe generally the service area of Commonwealth Edison?

A Yes. It is roughly the northern one-third of Illinois, about 13,000 square miles, including the City of Chicago and all of the Chicago metropolitan area which is Illinois.

Q Mr. Corey, I direct your attention to what has been received in evidence as Defendants' Exhibit 144, which is a map of Investor-Owned Electric Utility Services Areas. I wonder if you could describe by color and number the service area of Commonwealth Edison as shown on that map?

A I don't know whether that is mauve or purple, but it is No. 30.

Q Can you tell me, please, sir, what approximately [1584] Edison's net generating capacity was at the beginning of this year?

A Approximately 10 million kilowatts.

[1585] Q Could you tell me generally what the mix of fuel is as used by Commonwealth Edison in its generating plants?

A Yes. It is about 18.5 million tons a year of coal, 3 million tons of gas, 1 million tons of uranium, and an insignificant amount of oil, but we are changing this mix, and for the year 1971 we expect to burn approximately 16 million tons of coal, 5 million tons of gas, and with our nuclear units coming on, with additional nuclear units coming on, and Dresden 2 produced first power late last night, 5.5 million equivalent tons of uranium, and 1.4 million equivalent tons of oil.

When I use tonnage figures for oil and gas and

uranium, I am simply stating the BTU's in terms of equivalent tons of coal. It is for a total of about next year something on the order of 28 million tons of coal and other coal equivalents.

Q Prior to last evening, where was the nuclear fuel burned that you referred to with respect to 1969?

A Well, I was not referring to 1969. I was referring roughly to a normal annual burn of fuel. In 1969 we burned a little less uranium than I mentioned because the unit which you are asking me about was not [1586] in service all year. We burned only 700,000 equivalent tons of nuclear fuel, and that was burned at Dresden Unit 1, at Dresden station, where the Kankakee and Des Plaines Rivers come together to form the Illinois River.

Q How long has Dresden 1 been in operation?

A Since 1960.

Q What other nuclear plants do you have presently in operation or under construction?

A Well, the one that came on, that produced first power late last night, was Dresden Unit 2, an 809,000 kilowatt unit, located at Dresden station.

We have a third unit scheduled to come in service at Dresden station, Dresden Unit 3, another 809,000 kilowatt nuclear unit scheduled for service toward the turn of the year, either late December or early January, next year, scheduled to produce first power.

We have then two units scheduled for service at our Quad-City station, which is located on the Mississippi River north of the Quad Cities of Davenport, Moline, Rock Island and East Moline, and each of these two units will be 809,000 kilowatt units, one scheduled for service early next year and the other scheduled for [1587] service late next year or early the following year.

Then we have two units under construction at our Zion station, which is located near the municipality of Zion, on Lake Michigan, near the Wisconsin-Illinois line.

These are each 1100 megawatts, that is, 1,100,000 kilowatts, nuclear units, one schedule for service in the

Spring of 1972 and the second scheduled for service in the Spring of 1973.

[1588] Finally, we have two nuclear units just announced. They have not been ordered. We have received bids and are currently evaluating bids. These are for approximately 1,100,000 kilowatts for each unit. We have not designated the location, but we expect it to be on the Illinois River some place in central Illinois.

These are scheduled for service in 1976 and 1977.

This brings our total nuclear capacity, after deducting a portion that is owned by Iowa-Illinois Gas & Electric Company, a portion of the Quad-City stations—it brings the total capacity to approximately 7,400,000 kilowatts.

Q And that would include the two new units that you have just announced?

A Yes.

Q Could you tell me roughly what the coal equivalent would be of the nuclear fuel to be burned in the stations which will total 7,400,000 kilowatts?

A Well, we think it is on the order of 20 million tons per year.

Q Do you know how Commonwealth Edison compares with other utilities in the country in terms of nuclear units in operation or under construction?

[1589] A Yes. We have the largest nuclear program announced, to my knowledge. We are just about neck and neck with TVA. TVA had some 5½ million kilowatts announced prior to our announcement of a week or two ago, and we at that time had about 5,400,000, including 200,000 portion to be owned by Iowa-Illinois Gas & Electric Company. I believe our recent announcement makes us larger than TVA, but I know they are considering two or three additional nuclear units. So we are about neck and neck with TVA, and we represent, oh, about some place between 8 and 10 percent of all the nuclear capacity on order, under construction, or in service in the United States.

So the two of us together would have about one-fifth of the capacity, or a little less than that.

THE COURT: Can you hear the witness at the table? There is no indication that you cannot. Proceed.

BY MR. HEDLUND:

Q Mr. Corey, I believe you gave us an indication of your fuel mix for the year 1971. Could you give me a similar indication for the year 1974?

A Yes. About 15 million tons of coal, 4½ million tons of gas, 14 million equivalent tons of uranium, and 1½ equivalent tons of oil, making a total [1590] of 35 million tons of coal or equivalent tons of other fuels.

This, however, is subject almost to constant change, Mr. Hedlund. We announced a low sulphur coal program early in March. We announced an additional modification of that low sulphur coal program or fuel program, I should say, later in March. Recently the mayor introduced a new Chicago ordinance or a proposed new ordinance further limiting sulphur output. This will further modify our future program.

Moreover, neither I nor anyone else knows what the future of the oil import situation may be. I have given you a figure of 1.4 equivalent tons of oil. That represents the oil we expect to get for the generating stations, plus a minor amount for our peaking units.

[1591] As we all know, the oil import picture is in a very uncertain situation. I don't know what the Administration is going to propose with respect to oil import quotas, so that I really am simply giving you a figure that represents today's figures unchanged for oil and for gas, a little less than we have today, simply on the assumption from everything I have read in the papers that probably we won't be getting much gas sometime in the future, but maybe we will.

If it is available, we certainly will be burning more gas and more oil than we are now.

Q Just based on the figures that you gave me, of the 35 million tons of coal equivalent, actually about 40 percent of that total will be coal, is that correct?

A That is our expectation.

Q Is it fair to say, Mr. Corey, that you cannot predict with any real precision what your fuel mix is going to be in the next five years as it relates to coal, oil and gas?

A That's right.

Q I believe you have stated that Dresden 1, your first nuclear plant, went on stream in 1960. When did you order that plant?

A 1955.

[1592] Q At the time you ordered it, what were the reasons that led you to that decision?

A We thought nuclear power was a bright new idea and we wanted to be in the forefront of its development. We have been working with Argonne National Laboratory and the Atomic Energy Commission since 1950, or approximately 1950. We had a study team working on the development of the concept of the boiling water reactor, which we finally ordered in 1955 for our Dresden station.

Q In terms of results at Dresden 1, has it been satisfactory with respect to safety and the reliability of performance?

A Yes. Extremely so.

Q Has it been satisfactory with respect to cost?

A Yes. This requires a little qualification. This was a "Model T" unit in the sense that it was intended to be a full scale unit but not a unit benefiting from improvements in technology which we hoped at the time would reduce full burn-up, increase the kilowatt hour output per pound of uranium burned, which would eventually cut costs.

When we ordered Dresden 1, we had some targets in mind and it met the targets.

Q What about your experience with Dresden 1 [1593] in terms of its flexibility in meeting changes in load-up requirements?

A It has been very satisfactory in that respect. It has been more flexible than a large coal-fired boiler would be.

Q Can you explain that, sir?

A Well, it can move up and down faster and follow load changes better.

Q With respect to the other units which you have under construction or have announced, could you tell me, please, generally, what your reasons were for ordering these nuclear plants?

A Well, at the time the first one was ordered, that is Dresden Unit 2 was ordered on February 5, 1965, and during the ensuing 18 to 24 months, we ordered the remaining units, Dresden 3, Quad Cities 1 and 2, and Zion 1 and 2, and during that period it appeared that whereas we can't be terribly precise about these things, in trying to project a cost of a unit which may not be completed for five or six years, we recognize we were dealing with estimates, but we felt the costs were very close between nuclear and the coal-fired units, and in which we felt that the nuclear units had a bit of an edge, something on the order of a quarter to a half a mil per kilowatt hour in cost advantage.

[1594] Since then, why, so many changes have occurred, changes in the cost of money, changes in the whole picture with respect to the environment and the possibility of having to spend very large amounts of money to remove sulphur from Illinois coal or to bring in coal from Wyoming or Colorado or Montana, that I find it hard to feel that today we can predict these costs even of these existing units that are under construction with the kind of accuracy that I thought we could predict in 1965 and 1966. But it certainly appears that the costs are very close. Moreover, today, as well as in 1965 and 1966, when we were ordering these units, we have a strong incentive to lean towards nuclear, because it is cleaner. It doesn't produce any fumes, any fire ash or sulphur dioxide. That is a nuclear-powered station does not. We had this definitely in mind when we ordered the units, the nuclear units, in 1955 and 1965.

THE COURT: We will take a short recess.

(A short recess was had, after which the following further proceedings were had herein, to-wit:)

[1595] THE COURT: Off the record.

(There was an off-the-record discussion, after which the following further proceeding were had herein, to-wit:)

THE COURT: You may proceed.

MR. HEDLUND: Could I have the witness' last answer? I think I can carry on without it.

THE COURT: You were interrogating on Dresden No. 2, Dresden No. 3, and the comparative efficiency of them, according to my notes.

BY MR. HEDLUND:

Q Mr. Corey, over, say, the last ten years, and without going into specific details, could you tell me whether or not the construction costs of your nuclear stations have increased beyond that for coal-fired stations, not increased as much or stayed about the same

A Well, for the—well, that is a large order in one question, Mr. Hedlund, but costs were declining for some time. That is the economics of scale in the power plant field were offsetting the costs of construction cost inflation, and this held true generally through the fifties, and into the sixties, up until the completion of our Joliet and Kincaid units, two units at Joliet and two units at Kincaid, which were placed in service in [1596] 1965, 1966, 1967 and 1968; and these four units represented sort of a low point in the construction costs, and since then construction costs have been rising, and they have risen for both nuclear and coal-fired units, and up until a few weeks ago I would have said to you without any question that they are going up about evenly.

In fact, I testified to that effect in our rate case last fall, that the low point for construction costs of coal-fired units was roughly $120 a kilowatt, and at about the time that low point was reached we ordered Dresden 1 and 2 and Quad Cities 1 and 2 from General Electric Company on a turn key basis under contracts which will enable us to complete those four units at roughly $120 a kilowatt, including all overheads.

Since then the costs have escalated so that the Zion units which are not being built on a turn key basis but which are being built by us and by the various contractors contracting with us—

Q Excuse me for interrupting, but these are the nuclear units, the Zion?

A Yes, nuclear. They are now budgeted on something on the order of $185 per kilowatt to $190 a kilowatt, and the Powerton 5 unit, a coal-fired unit which is scheduled

for service at just about the sametime, [1597] but which is being built on a slightly accelerated schedule, is budgeted at about $215 a kilowatt.

That is a coal-fired unit, and so I did testify and did feel with respect to those units that we had about a 50 or 60 percent cost escalation since 1965 on both coal-fired and nuclear units.

[1598] Now, we have taken bids on nuclear units for 1976 and 1977 service and anticipating further cost increases and, of course, all of these estimates include prospective cost increases through to the service date, and we find we may be talking about costs on the order of $300 a kilowatt, but our estimates of coal-fired unit costs don't show quite as much of an increase in construction costs.

I do not have the figure in mind as to what we are estimating coal-fired units, but I do know that all costs considered, including the cost of removing sulphur dioxide from the stacks of sulphur from the coal or of bringing in low sulphur Western coal result in the over-all cost per kilowatt being just a trifle higher or neck and neck, as I said a little while ago, with nuclear despite the increased construction costs on the nuclear.

Q Could you tell me why Edison decided to build Powertown No. 5, the coal-fired unit?

A Yes, we needed additional capacity for 1972, and we didn't have any way of building a nuclear unit in time to meet it. The alternative would have been to buy more gas or oil fired peaking capacity, that is gas turbines gas or oil-fired turbines or gas engines, and we had [1599] already bought about a million and a half kilowatts of that sort of capacity and felt we didn't need any more of that peaking capacity, and we wanted a base load unit, and the coal-fired base load unit was the only one that could be built in time.

The reason we were short of capacity was a combination of factors but, primarily, the delays in bringing our nuclear units into service.

Q Has Edison contracted for the coal to supply Powertown?

A Well, yes, certainly.

Q Are you familiar with that contract and with whom it is?

A I am just in a general way familiar with the fact we have contracted for coal to supply Powertown from the Carter Mine to be operated by a subsidiary of Humble Oil Company in Illinois.

Q Do you know what the length of that contract is and the tonnage is to be supplied each year?

A I might be able to refresh my memory. If you want me to take a look and see if my notes will tell me—

Q If I might try to refresh your recollection, might I suggest to you that the contract runs initially [1600] for ten years at about 3 million tons per year and with two five-year renewal options. Would that coincide with your recollection of that contract?

A Yes.

Q Mr. Corey, you have testified to some degree of comparable costs between nuclear and coal, and you testified to the air pollution considerations as they are applied to coal.

I would like to ask your opinion as to the future of nuclear-fired units or nuclear fuel units in the electrical utility industry and, by the future, I ask over the course of the next ten years.

A Well, as far as Commonwealth Edison is concerned, we have sort of put our eggs in the nuclear basket. We believe that nuclear power is the best way to provide base load electric generation, and we intend to move in this direction.

On the other hand, we don't intend to completely forget coal, and we do intend to look at the possibility of a coal-fired alternative every time a decision comes up, but I believe that we will—well, the very fact we have just announced that our 1976 and 1977 units will be nuclear indicates that we believe this is the best way to take care of our massive [1601] electric power generation problems with a minimum of disturbance to the environment.

Q Is Commonwealth Edison participating in the development of the breeder reactor?

A Yes.

[1602] Q Could you describe briefly your participation in that?

A We have engineers assigned to work with both Westinghouse and General Electric Company, and both Westinghouse and General Electric Company have breeder projects going forward, breeder research and development projects, studies going forward, and we are contributing to each of these projects.

We are also privileged as a result of our taking part in each of these projects also to sort of look over the shoulder of General Electric Company and its partners in a project for the construction of a prototype breeder down near Fayetteville, Arkansas, which I believe is almost completed, if it is not completed.

We have our engineers who are assigned to these breeder projects come back and brief the top management once a month or thereabouts in detail as to the outlook for the future.

I expect that within the next year or so the Atomic Energy Commission will select one or two commercial scale breeder projects to be built and tried out, and I would not be at all surprised if we were a member of the group selected.

Q Mr. Corey, there is already in evidence in this [1603] case a number of announcements by Commonwealth Edison in terms of its, if I may paraphrase it, environmental program in the city of Chicago, in which such things have been mentioned as the increased use of natural gas, the retirement of coal-burning facilities, the increased use of low sulphur oil and the use of low sulphur coal.

Taking these programs into consideration as far as your stations in the Chicago area are concerned, could you quantify the amount of high sulphur coal that will be displaced by these various programs in the Chicago area that will be followed by Edison?

MR. CUSACK: Your Honor, I think Mr. Hedlund should indicate what he means by "the Chicago area," or at least ask the witness what he means by it.

BY MR. HEDLUND:

Q Mr. Corey will explain.

In terms of the stations in the Chicago area that would be affected by this program, is what the question is directed at.

A Well, the best way I can quantify this is to say that based upon the programs we have announced, that is the programs for bringing in low sulphur western coal, for bringing in some medium sulphur west Kentucky [1604] coal, for converting Ridgeland station to oil and for burning more gas—based upon those programs, our guesses at the moment are that instead of burning something on the order of 18.5 to 19 million tons of Illinois coal a year, we may by next year be down around 11.5 to 12 million tons.

Another way of putting it is to say that we probably are displacing at least 5 million tons, annual tonnage, with several things—with 2 million more tons gas, 1.25 million more tons of oil, and at least 4.5 million more tons of low sulphur coal from outside Illinois.

[1605] Now, of course, those things add up to more than 5 million tons; but we also have some growth in our electric usage. We will be using a lot more uranium. But so far as the Chicago area is concerned we have got the additional oil, the additional gas, and the low sulphur coal from the west, and over a period of a couple of years it will be at least 5 million tons displacement.

Q And the 5 million tons displaced would be, would it not, high sulphur Illinois coal, that is, coal with a sulphur content of 2.5 percent or greater?

A Yes.

Q If I may ask you to go back to 1967, 1968 and 1969, in that general period, would you tell me approximately what percent of the coal produced in the State of Illinois was consumed by Commonwealth Edison?

A Roughly 25 percent.

Q Is there any other investor-owned utility in the country that you know of that consumes more coal than Commonwealth Edison?

A No. I don't believe I have made an outright comparison with American Electric Power Company, and I am not sure when you said "company" whether you were referring to holding company or operating company. [1606] American Electric Power Company produces more kilowatt hours than we produce, and they are a largely coal-fired generating company. So taking all of their

subsidiaries for their entire system, I would suppose that they use more coal than we do, but I haven't checked it.

Q Mr. Corey, do you recall an interview on which you and Mr. Ward and Mr. Behnke participated in that was published in "Nucleonics Week"?

A Yes. Are you sure it is Behnke and not Ayres?

Q It appears to be Behnke. To refresh your recollection on that and then to ask you some questions about this interview, I want to show you what has been received in evidence as Defendants' Exhibit 93. This document has an excerpt from "Nucleonics Week" for April 4th, April 11th and April 18th.

I direct your attention—

A 1968?

Q 1968, yes. I direct your attention to the third page of this document, which is the second series of this interview, and to the third paragraph on the page that starts as follows—this article purports to quote the substance of the remarks made by yourself and the other two gentlemen, and I wish to ask you after I have read it whether it accurately reflects the [1607] substance of those remarks at the time.

The third paragraph says:

> "You cannot buy coal now for such a plant without buying it on virtually a cost plus basis. Our policy is to buy it on five to ten year contracts. Coal is not a great big capital investment business. About all you do when you buy it is pay what it costs a man to get it out of the ground. We believe we can do better by buying it not from year to year, but in five or ten year intervals. That way we can buy from the most efficient miners, the ones who have the best people and are doing the best job at any given time."

Is that an accurate reflection of the remarks made by yourself and the other gentlemen during that interview?

A Yes.

[1608] Q Directing your attention to the last full paragraph on that page, which states as follows—

MR. CUSACK: Your Honor, the Government objects

to Mr. Hedlund's not reading the last sentence of that paragraph into evidence.

THE COURT: You mean in the third paragraph?

MR. CUSACK: Yes, your Honor. He should ask the witness the entire question and not take it out of context. It is obviously taken out of context as he read it and propounded the question to the witness.

THE COURT: Include it.

BY MR. HEDLUND:

Q The paragraph concludes:

"If we were to pick out one company and say, 'We are going to give you a long contract,' obviously he'll retort, 'Well, I will give you the best price I can, but I have to have escalation,' and then you end up with cost plus."

With that added, do the remarks now that I have read accurately reflect the remarks of yourself and the other gentlemen during that interview?

A Yes.

Q Directing your attention to the last full paragraph on that page, it states as follows:

[1609] "But once you get a mine-mouth plant, you absolutely have to contract for coal to supply it. The capital cost on the plant is $120 million. The capital cost on the mine is about $10 million. Obviously you can't be put in a position with a $10 million investor that holds you up because you have your big $120 million plant sitting beside his mine. So for all practical purposes, you have to buy the mine."

Is that an accurate reflection of the remarks made by yourself and the other gentlemen during this interview?

MR. CUSACK: Your Honor, Again the Government must object. He did not read the complete paragraph. I think the remaining sentences are imperative that they be asked.

THE COURT: Include them.

MR. CUSACK: He refers to one mine. I think the paragraph ought to be finished.

MR. HEDLUND: I think this can be done on cross examination, but I will finish it.

BY MR. HEDLUND:

Q It continues:

"That is the situation with our mine-mouth [1610] plant. We made a long-term cost plus contract for the coal. It runs to 1982; with three 10-year renewal options, that will take us to the year 2012. The need to protect your investment in a mine-mouth plant may give a false impression that longer term coal contracts result from the competition with nuclear fuel."

Is that paragraph an accurate reflection of the remarks made by yourself and the other gentlemen during that interview?

A Yes.

Q Is the contract referred to therein the contract which you previously have testified with respect to the subsidiary of Humble Oil?

A No. That is the contract with Peabody for Mine 10.

[1611] Q In your judgment, Mr. Corey, for the energy system of Commonwealth Edison, will nuclear energy continue to compete with coal?

A I don't understand the question.

Q Let me rephrase it. In your opinion, for the fuel business of Commonwealth Edison, the fuel requirements or energy requirements of Commonwealth Edison, will nuclear energy continue to compete with coal?

A Yes.

Q Mr. Corey, the evidence in this record indicates that Freeman and United Electric Coal have been affiliated companies since at least 1959. To your knowledge has that relationship had any adverse effect on Commonwealth Edison?

A No.

Q Assuming that United Electric neither owns nor produces coal having a sulphur content less than 2.5 percent and assuming that United Electric has sold or oth-

erwise committed all but approximately 4 million tons of its mineable reserves spread among its four existing mines, would the continued common ownership of Freeman and United Electric in your opinion have any adverse effect upon Commonwealth Edison?

[1612] A No.

Q In your opinion, Mr. Corey, what is Commonwealth Edison's major concern with respect to competition among its fuel or energy suppliers?

A I guess it is to have adequate competition and as the energy field gets more diverse, it is hopefully to continue to have effective competition between coal and oil and nuclear. I believe that is one way of putting it.

Another way of putting it is that we have some very, very, very large companies moving into both the coal field and the nuclear field, and I am referring to Humble Oil getting into the coal fields in Illinois. And I am referring to the large oil companies getting into the nuclear business. I am including Conoco—and what is small for an oil company is large for anyone else—Kerr-McGee, Gulf, Gulf General Atomics.

With these things taking place and coupling this with what we saw, how difficult it was for us to get very much effective competition from foreign oil, since it took us almost five months just to get permission to import a little foreign oil for one of our stations, I would say it is important that we continue to have a diverse number of capable financially-responsible [1613] competitors in the energy business so that they are able to compete with the kind of new entrants into our fuel business.

I really would hate very much to see that we had to turn for coal, oil and uranium to just two or three major oil companies. We might then find that we did have a very distinct lack of competition.

MR. HEDLUND: Thank you. That is all I have.

THE COURT: Are you ready to proceed now, or do you desire to recess? Will that expedite your cross examination?

MR. CUSACK: I think it might, your Honor.

THE COURT: We will recess, then, until 2:00 o'clock. Prepare your questions accordingly.

MR. HEDLUND: May we be off the record, your Honor.

THE COURT: Off the record.

(There was an off the record discussion after which the following further proceedings were had herein, to-wit:)

THE COURT: We will recess now until 2:00 o'clock.

(At 12:15 o'clock, a recess was taken until 2:00 o'clock p.m. of the same day.)

• • • •

AFTERNOON SESSION 2:00 P.M.

• • • •

[1623] GORDON R. COREY,

called as a witness by the defendants herein, having been previously duly sworn, resumed the stand and testified further as follows:

CROSS EXAMINATION

BY MR. CUSACK:

Q During your direct examination, Mr. Corey, you testified in regard to the commitment of Commonwealth Edison to nuclear plants in the future. You stated that Commonwealth Edison does not intend to completely forget coal and that you will look at coal-fired alternatives every time, is that correct, sir?

A Yes.

Q Is it true, Mr. Corey, that the Commonwealth Edison Company recently has petitioned the Illinois Commerce Commission for permission to set up a fuel subsidiary?

A Yes.

[1624] MR. CUSACK: I ask the reporter to mark for identification as GX-135 a 6-page document entitled "State of Illinois, Illinois Commerce Commission, Commonwealth

Edison Company Application for Authority to Cause to be Formed and to Invest in a Subsidiary Corporation to Conduct Certain Activities Ancillary to its Public Utility Business."

(The document was thereupon marked as GX-135 for identification.)

BY MR. CUSACK:

Q Mr. Corey, I hand you what has been marked as GX-135 and ask you, sir, if you please could identify that document?

A Yes. That is Commonwealth Edison's petition to the Commerce Commission for permission to establish a subsidiary.

Q This is the fuel subsidiary, sir?

A Yes.

[1625] Q And this petition is dated March 26th, is that not correct, sir?

A Yes.

Q Excuse me. What is the date of the petition?

A March 26, 1970.

Q Now, the petition states in part, Mr. Corey, at page 1, numbered paragraph 3:

> "Fossil fuel procurement has become increasingly difficult. The growth of nuclear power has had the effect of making coal mine operators reluctant to open new coal mines in and near Edison's territory."

Is that correct, sir?

A Yes.

Q Mr. Corey, is it true that a subsidiary of Commonwealth Edison Company is at the present time acquiring coal reserves in Menard County, Illinois, near the town of Petersburg?

A I am not acquainted with the location, but we are acquiring coal reserves.

Q Are these reserves being acquired, sir, by a corporation named PIAMCO, Incorporated?

A Yes.

Q Is this company headquartered in St. Louis?

[1626] A Yes.

Q Would it refresh your recollection, sir, if the land subsidiary of PIAMCO was called the Menard County Land Company?

A I don't know.

Q This corporation is in the charge of Mr. Snyder, isn't that correct, sir?

A That's right.

Q Formally of the Peabody Coal Company?

A Yes.

Q Mr. Robert Snyder?

A Yes.

Q Can you tell us, Mr. Corey, approximately how many tons of coal Commonwealth Edison Company plans to acquire through PIAMCO?

A I don't know.

Q Can you give us an approximate number?

MR. HEDLUND: At this point, your Honor, I am going to object. I believe further inquiry along this line is outside the scope of my direct examination.

THE COURT: The objection is sustained.

[1627] BY MR. CUSACK:

Q Mr. Corey, is it contemplated that when air pollution control devices are developed, Commonwealth Edison Company will strip mine the coal reserves being acquired through PIAMCO?

MR. HEDLUND: Same objection, your Honor.

THE COURT: How is this within the scope of the direct examination? All we are dealing with here is the sole question as to whether or not they are acquiring reserves, as indicated on direct examination, because there was a scarcity.

Now, the amount and all of this new matter, I don't see how that is relevant.

MR. CUSACK: What I am attempting to determine, your Honor, is whether or not Commonwealth Edison Company has plans for the future development of these coal reserves it is acquiring in Illinois and what it plans to do with these reserves going to the general problem or the question of the nuclear versus coal commitment of Commonwealth Edison Company for its electrical generating stations.

THE COURT: Do you have any response?

MR. HEDLUND: Again, I do not believe—well, your Honor, the petition, in a sense, covers it on its face in [1628] terms of the statement that it does not plan to mine this coal until air pollution devices are available.

Now, I believe this witness has testified on direct examination that they are not going to forget coal. The petition, I think, on that score speaks for itself.

Obviously, if they are going to acquire coal as well as other forms of fuel and other aspects of this petition, I think it is reasonable to assume that indeed Commonwealth Edison is not going to forget coal.

[1629] But I would argue that going into the minutia of this and the details of the coal, and so forth, is outside the scope of the direct examination.

THE COURT: The objection is sustained. Proceed.

CROSS EXAMINATION

BY MR. CUSACK:

Q Mr. Corey, approximately how many tons of coal were purchased and consumed by Commonwealth Edison Company in 1950?

A I don't remember.

Q Do you have any idea, sir?

A I am trying to think. It would be, at best, a wild guess. 1950?

Q Yes, sir.

A Well, it is somewhere between five and ten million tons.

Q Would it be under 10 million tons?

A I am not certain.

Q In 1960, sir, how many tons, approximately, of coal were consumed by Commonwealth Edison Company?

A Well, I would again—well, it is between twelve and fifteen million.

• • • •

[1632] Q Excuse me, the Kincaid Station, and is that the only minemouth generating station of Commonwealth Edison Company at the present time?

A Yes. May I now correct, for the record—I have finally located the precise figure on coal for 1969. It was 18,800,000 tons.

Q Thank you, sir. Sir, since 1950 the Commonwealth Edison Company has built the Ridgeland generating station, is that correct, sir?

A Yes.

Q This was originally built as a coal-fired station and has now been switched to oil, is that correct?

A It is being switched to oil right now, hopefully by July 1 of this year.

Q And the net generating capacity of the Ridgeland Station is about 337,000 kilowatts, is that correct, sir?

A That sounds right to me.

Q In 1951 Commonwealth Edison built the Waukegan generating station, is that correct, sir?

A No, it built a unit at Waukegan. Waukegan has been there 40 years.

Q Is Waukegan a coal-fired station, sir?

A Yes.

Q What is the approximate generating capacity of [1633] Waukegan?

A I can look it up. I would guess about 1,700,000 kilowatts. That is again my estimate.

If you want a precise figure, I will check it for you.

Q Commonwealth Edison Company owns the Dixon generating station, is that correct, sir?

A Yes.

Q Is that at Dixon, Illinois?

A Yes.

Q Is this a coal-fired station?

A All of these stations you are referring to are coal-fired, but both Dixon and Waukegan also burn gas.

[1634] Q How much gas is burned, approximately, in Waukegan, as a percentage of the total energy of that station?

A I would guess about a third.

Q And what would the figure be for Dixon, sir?

A I just don't remember. It is probably on that order, a quarter to a third.

Q Is the gas burned at Dixon and at Waukegan interruptible gas?

A Yes.

Q And available then only in the summer?

A Generally, yes.

Q In 1955 is it correct, sir, that Commonwealth Edison Company constructed the Will County Generating Station around that time?

A In 1955, yes.

Q And that is a coal-fired station, sir?

A Yes.

Q What is the approximate kilowatt capacity of that station? Would it refresh your recollection if I said 328,000.

A That was what was built in 1955, but we also built a unit in 1957 that was 280,000 kilowatts, roughly, and then we built another unit in 1963 that was about [1635] 360,000 kilowatts, I believe, so it is about a million kilowatts.

Q And that is a coal-fired station, sir?

A Yes.

Q In 1955, Commonwealth Edison built the State Line generating station, is that correct, sir?

A It built one unit in 1955. The station itself was started in 1929. Mr. Insull built the first two units there, I believe.

Q Is this a coal-fired station, sir?

A Well, again, it burns a lot of gas but it burns both gas and coal.

Q Is it interruptible gas which is burned at this station?

A Yes.

Q Approximately what percentage of the total energy consumed at the State Line station is coal?

A I really don't have these figures in my mind. I would say roughly a quarter to a third, but when I say that I am just picking the figure out of the air, Mr. Cusack.

Q Would it be any more than a third?

A I doubt it.

* * * *

[1638] Q You are putting in a foundation and a chimney, is that correct, for another unit?

A I don't know about the foundation. We are leaving space for another unit, and we are trying to get permission to build the stack high enough and large enough so that it will take two units.

Q Would you anticipate, sir, that if another unit is built at Powerton, that is Powerton No. 6, that this would be a coal-fired station?

A Yes. Not necessarily, though, Mr. Cusack, but this would be a strong possibility.

Q Would it also be a strong possibility, Mr. Corey, that Commonwealth Edison Company would construct in the next ten or fifteen years additional minemouth coal-fired generating stations?

A Well, it is certainly a possibility. You see, I just —at the moment I have just been going through an evaluation of coal versus nuclear for the two units we talked about this morning, and we came out on the nuclear side, and with environmental considerations what they are, I have to say that the chances were very—were preponderantly against the construction of a coal-fired station.

Q Mr. Corey, Commonwealth Edison Company is making [1639] great efforts, is it not, to control emission from coal-fired stations, is that correct, sir?

A Yes.

Q And the 1969 annual report of Commonwealth Edison Company states that:

> "Commonwealth Edison Company has already spent $53 million on facilities to prevent contaminants from getting into the air."

Is that correct, sir?

A Yes.

Q And Commonwealth Edison Company also has plans to spend substantial additional sums, does it not, on air pollution control devices?

A Yes, we have plans to spend about 160 to 170 million dollars on air and water pollution control specifically without respect to nuclear in the next few years.

This is with respect to sulphur dioxide to remove it.

Q Directing your attention, sir, to the coal-fired units of Commonwealth Edison Company, approximately how much money has already been spent to control pollution at the Commonwealth Edison Company coal-fired units?

MR. HEDLUND: Your Honor, I am going to object to [1640] the phrasing of that question because I think it is misleading. There are a number of ways of controlling sulphur dioxide emission from a coal-fired station. One way is to convert it to oil. Another way is to burn less coal or to burn low sulphur coal, and I submit that the question phrased is incapable of answer unless you parse it out in terms of what you are doing and then what you are doing as to cost.

THE COURT: Rephrase your question, Mr. Cusack.

[1641] BY MR. CUSACK:

Q Mr. Corey, at the present coal-fired generating plants of Commonwealth Edison approximately how much money already has been spent on pollution control devices?

A Are you speaking of air pollution?

Q Yes.

A I believe it is the $53 million figure you just referred to in the annual report.

Q Can you give us an approximate sum of money that Commonwealth Edison Company plans to spend on its present coal-fired generating stations?

A Well, I mentioned—

MR. HEDLUND: I object again. I don't think that is a question. Spend for what?

BY MR. CUSACK:

Q For pollution control devices.

A I just mentioned $170 million for air and water pollution in total, and I really don't remember how that is split between water and air. I do know that some of it applies to cooling water devices at nuclear plants, so I can't say that is directly responsive to your question.

If you want something right off the top of [1642] my head, and taking your question as a question with respect to air pollution, and including sulphur removal and the like, I would say on the order of $50 million.

This again is not a considered figure. It is a rough

approximation of what I think is in that $170 million figure.

Q It is a fact, is it not, Mr. Corey, that Commonwealth Edison Company has been a leader in electrostatic precipitators on coal-fired generating stations?

A Yes.

Q And it is a fact that Commonwealth Edison Company led in the development of these devices as far back as 1929?

A Yes.

Q And is it not also a fact, Mr. Corey, that Commonwealth Edison Company has been heavily engaged in research in regard to sulphur emission devices, control devices, on coal-fired stations?

A Yes.

Q And you have done work, have you not, with the Humble Oil Company in this regard?

A Yes.

[1643] Q Now Mr. Corey, approximately how much money already has been spent by Commonwealth Edison Company in the development of sulphur dioxide emission control devices on coal-fired stations?

A I don't know.

Q Could you give us an approximate figure?

A I just am not able to approximate it.

Q Do you anticipate that within the next five years, Commonwealth Edison Company, either by developing the equipment itself or by developing it in concert with others, will be able to achieve or will be able to develop an acceptable SO_2 emission control device on its coal-fired stations.

MR. HEDLUND: Your Honor, I think there are two questions in there. My confusion is with the "achieve" or "develop".

THE COURT: I think they are nearly synonymous. He may answer. It is clear to the witness.

BY THE WITNESS:

A Yes.

BY MR. CUSACK:

Q Mr. Corey, when these devices are developed, do you anticipate that Commonwealth Edison Company then will be able to continue to utilize high sulphur [1644] Midwestern coal?

A Yes, but I don't quite like your using the word "continue". We intend to reduce the sulphur content of the coal we burn in accordance with the ordinances and cut well below the requirements in the ordinances that are now in effect and are pending, and if and when we get good sulphur removal processes, then I certainly would expect that we would and should return to using Illinois coal. But not until that time happens. I am quibbling over the word "continue".

Q I understand. And based on your belief in the future of Illinois coal, Commonwealth Edison Company is in the process of developing coal reserves in Illinois which will be used when Comomnwealth Edison Company develops these devices, is that correct?

A Acquiring coal, you say?

Q Acquiring coal.

A Not developing.

Q Is that correct, sir?

A That's right.

Q During your direct examination, Mr. Corey, Mr. Hedlund asked you in regard to some statements made in Defendants' Exhibit 93, the interview in the "Nucleonics Week" magazine of April 4, 1968, between you, Mr. Ward [1645] and Br. Behnke.

Mr. Hedlund asked you in regard to paragraph 3 on page 5 of this exhibit, which I hand you, and the last sentence in that paragraph reads as follows:

> "If we were to pick out one company and say 'We are going to give you a long contract', obviously he will retort, 'Well, I will give you the best price I can, but I have to have escalation,' and then you end up with cost plus."

Mr. Corey, isn't it true that most of the coal contracts to supply Commonwealth Edison Company do have escalation clauses?

A Yes.

[1646] Q Could you tell us very briefly what this escalation consists of?

A It has been a long while since I worked on those clauses, but they generally are rather informal type clauses that provide for consideration of escalation in labor costs, in material costs, changes in—well, there was no provision for changes in productivity so I will strike that. Also consideration of changes in the coal market and changes in taxes and miner's royalties—that is United Mine Workers royalty provisions.

However, the clauses are not automatic clauses. They are clauses which provide for periodic negotiation based on a renegotiation of the escalation provisions based upon consideration of these factors. It worked quite well.

Q Mr. Corey, isn't it true that most of the long-term coal contracts of Commonwealth Edison Company are constantly undergoing renegotiation?

A I didn't realize it, but there is a fair amount of, from time to time, changes or extensions in the contracts. Our principal problem the last couple of years, however, has been to get performance. Everyone in the United States is short of coal and we just aren't getting the coal that is provided for in the contracts.

[1647] That, incidentally, does not apply to United Electric. They are one of the few contracts that we have had that we have had almost complete performance under.

Q It is a very fine company, isn't it?

MR. HEDLUND: Your Honor, I would like to hear that answer.

THE COURT: Are you moving to strike it?

MR. HEDLUND: No, I don't think so. I would like to hear it back.

THE COURT: Read the answer, please.

(Record read by the reporter.)

THE COURT: You may proceed.

BY MR. CUSACK:

Q United Electric is a very fine company, isn't it?

A I guess so.

Q Isn't it true, Mr. Corey, that for a number of years Commonwealth Edison was almost solely dependent upon coal as a source of energy?

A Yes.

Q And isn't it true, Mr. Corey, that in the future coal will be a very important source of energy to the Commonwealth Edison Company? Given, that is, [1648] the development of SO_2 pollution control devices?

A Yes.

Q In your direct examination, Mr. Hedlund asked you for the years 1967, 1968 and 1969 about the approximate percentage of Illinois coal production consumed by Commonwealth Edison. The evidence in this case shows that in 1967 total Illinois coal production was 64,814,000 tons. The evidence in this case also shows that in 1967 the total coal production in Illinois, Indiana and west Kentucky was 129,500,000 tons.

Approximately what percentage of this production was consumed by Commonwealth Edison Company in 1967?

MR. HEDLUND: I will object. I believe that question implies that there was consumption by Commonwealth Edison Company in those years of coal from Indiana and west Kentucky. If it does not imply that, he is just asking Mr. Corey to make a mathematical computation, and I object on that basis.

THE COURT: It is not clear.

MR. CUSACK: I will connect it up, your Honor.

THE COURT: I say your question is not clear. It is not clear how you are applying it to them, to all of these different states. Do you have the figures? If you do, give Mr. Corey the figures, and ask if they bought coal from those states.

[1649] BY MR. CUSACK:

Q Mr. Corey, I direct your attention to GX Weir Deposition Exhibit 1, which is a map entitled "Illinois-Indiana-West Kentucky Shipping Coal Mines, January 1969."

Mr. Corey, is it a fact that the Commonwealth Edison Company generating stations purchased coal from throughout the area set out on this map?

MR. HEDLUND: I will object unless Mr. Cusack takes that in terms of specific generating stations. I think it is misleading to lump the purchases for all generating stations in such a manner.

THE COURT: The objection is overruled. He may answer. He may answer if he knows.

THE WITNESS: What is the question?

(Question read by the reporter.)

BY THE WITNESS:

A In what period?

BY MR. CUSACK:

Q At the present time.

A Well, not exactly. I don't think we are taking any Indiana coal. I could be mistaken with respect to an insignificant amount, but I don't think we are taking any Indiana coal at the moment.

[1650] Until we contracted for some west Kentucky coal recently because we thought we could get some with a lower sulphur content down there and have been fairly disappointed about it, we haven't been taking any West Kentucky coal recently. We have during the early 1960's taken some from the River Queen Mine on the Green River in West Kentucky, but generally we have not been taking West Kentucky coal except occasionally to make up shortages.

Q Do you anticipate that Commonwealth Edison Company will in the next few months be increasing its consumption of west Kentucky coal?

A Yes. We are in a fair spot, however, on that. We as an interim measure tried to some buy some West Kentucky coal, and it is a medium sulphur content, and it is 2.5 percent sulphur, and this is not low sulphur, but it is lower than Illinois, and we got it for that purpose. But it will not meet the proposed provisions of the new Chicago ordinance. Whether we take that coal or not I am not sure what we are going to do.

Q Mr. Corey, in the last ten years, Commonwealth Edison Company has purchased coal from mines located in Indiana, is that correct, sir?

A I am quite sure sometime in the last ten years, [1651] yes, but not very much. You see, we anticipated buying a good deal of Indiana coal from the Lynnville Mine of Peabody. That was about 10 years ago. We started a unit train operation, but it never worked out, because we were stopped from crossing the EJ&E tracks and had to change the whole plan.

Q It is true that Commonwealth Edison at the present time does purchase coal throughout the Illinois coal field, is that correct, in the state of Illinois.

A Well, fairly widely. That is a pretty broad statement, Mr. Cusack. We buy from a lot of different Illinois mines.

Q Mr. Corey, do you consider that the Commonwealth Edison Company is in a position to overreach the midwest coal producers in negotiating with these coal producers?

A I don't understand the question.

Q Do you consider that the Commonwealth Edison Company is in a position to bargain unfairly with the mid-west coal producers in negotiating for the purchase of coal from these producers?

A I thought that we were the fat boy, but we bargain as well as we can and try to hold our own. I don't believe that we bargain with coal producers, though. We bargain with individual suppliers.

[1652] Q Mr. Corey, do you believe that the Commonwealth Edison Company's purchasing power in the acquisition of energy resources creates an unfair advantage over the Midwest coal producers?

A No.

Q It is true, is it not, Mr. Corey, that the Tennessee Valley Authority purchases more coal than the Commonwealth Edison Company?

A Yes.

Q Do you believe that Commonwealth Edison Company in its purchases of coal is in a better, a worse or about the same position as TVA?

A You mean as to its bargaining position?

Q Yes, sir.

A I think about the same.

Q Would your answer be the same with regard to Union Electric?

A I assume so. I am not quite clear what you mean. I assume what you really are saying is can we buy as effectively or can we bargain as effectively as TVA or Union Electric, and I think the answer is yes.

Q Do you believe that Commonwealth Edison can bargain more effectively than TVA?

A In one respect, and in one respect only, and [1635] that is that TVA is restricted in its bargaining by some rules which are generally applicable to Government buyers and not to private buyers. These rules pertain to such things as public opening of bids, and things like this, which in my opinion are not so much designed to protect the rights of the buyer as to protect the rights of the seller.

There are many rules that apply by custom and by law to Government buyers which are designed to ensure that all of the constituents of the Government have the right to deal with it on equal terms. There are no such rules binding a private buyer. So we don't have to publish all of the bids, and therefore I believe we are able to bargain a little more effectively.

This has been a matter of public record and long discussion before the Federal Power Commission in reference to proposed purchasing regulations. I believe the TVA is to some extent harmed by the regulations it has to operate under. I am very close to a number of the TVA people, and I believe they recognize this.

Q Mr. Corey, would Commonwealth Edison Company be in a better position to bargain with coal producers than the Union Electric Company?

A I suppose about the same.

[1654] Q Would your answer be the same with regard to Northern States Power?

A Yes.

Q Wisconsin Electric Power Company?

A Yes.

Q Mr. Corey, directing your attention to the nuclear commitment of the Commonwealth Edison Company and to GX-135, the petition of the Commonwealth Edison Company before the Illinois Commerce Commission, do you

anticipate, sir, that there will be a shortage of uranium in the late 1970's and early 1980's?

A I don't know. I don't think so. Certainly there will not be if the present embargo on foreign uranium is lifted.

[1655] Q Mr. Corey, the City of Chicago's proposed bill, proposed apparently by Mayor Daley, pertaining to the 1 percent sulphur limit on coal burned, refers only to the stations within the city limits of Chicago, is that right, sir?

A That's correct, but there are some more regulations pending with respect to stations outside.

Q With regard to the Zion stations, Zion 1 and Zion 2, is it true that the Metropolitan Sanitary District of Greater Chicago has a suit pending in which it seeks to prevent the operation of the Zion nuclear plant on the ground that its thermal and radiation emissions will pollute Lake Michigan?

A Yes, sir.

Q Is that case still pending?

A Yes.

Q In the event Commonwealth Edison Company builds cooling towers at Zion 1 and Zion 2, how much approximately do you think this will increase the cost of the stations?

A Oh, probably $50 million. This really is not a question of cost. To keep the record clear, Mr. Cusack, the problem is a problem of weighing one environmental problem against another. Cooling towers are very large [1656] and very bulky, and so far no cooling towers of this size have been built this far north. Cooling towers give off a large amount of steam and vapor, especially in the winter months, and it could occasionally cause icing and other problems.

We have had a clean bill of health from the Federal Water Pollution Control Administration, and we believe that the interest of the community best will be served by pursuing our plans at Zion. However, from the standpoint of the over-all economics, cost of the cooling towers is what I mentioned, about $50 million.

[1657] Q Mr. Corey, on your direct examination you were asked whether or not the merger of Commonwealth Edison Company—excuse me, the merger of United Electric Company and Freeman Coal Mining Corporation was harmful to your company.

Is it a fact, sir, that United Electric Company coal is consumed at your river stations outside of Chicago?

A Yes, it is consumed at river stations, both outside of Chicago and inside Chicago.

Q And isn't it true that Freeman also supplies coal for the river stations of Commonwealth Edison Company?

A Yes.

Q Directing your attention, sir, to the period prior to 1959, before Frank Nugent and the other Material Service representatives went on the board of United Electric, did you consider United Electric and Freeman to be competitors?

A Yes.

Q Sir, in regard to the coal-fired stations of the Commonwealth Edison Company, can nuclear fuel be burned at these stations?

A No.

[1658] Q Is it a fair statement to say, Mr. Corey, that for the coal-fired stations of Commonwealth Edison the principal competitors for the energy fuel of these stations are coal producers?

A Yes.

Q Sir, is it true that the major coal suppliers at present of Commonwealth Edison Company are the Peabody Coal Company, Freeman Coal Mining Company, United Electric and Southwestern Illinois?

MR. HEDLUND: I am sorry, your Honor; may I have that question read back, please?

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A No, I don't think you can say that because of our large low sulphur program, and the coal we have been buying lately, contracting for that is, from the west is com-

ing from various new suppliers, whereas in a sense we have been phasing out.

As you know, the United Electric contract expires this year and has not been renewed, our contract with United Electric. We have bought coal from, as I said, from west Kentucky. We have bought coal from Wyoming. We have bought coal from Montana, and these [1659] are from new suppliers.

What we are doing right now is looking at a number of other new suppliers, so that I think in the sense of the present competitive situation, that these are not the principal competitors. Certainly, they are the principal current suppliers of coal, except that you didn't name Consolidated, which is also a supplier through its Truax-Traer Division.

Q Sir, when Commonwealth Edison Company develops an effective SO_2 emission coal device on its coal-fired stations do you anticipate the companies which I have named and including the Consolidation coal will be the principal suppliers of coal for Commonwealth Edison?

A I don't know. It is a distinct possibility, but I find it hard to predict what will happen or what may happen if we are successful in developing good sulphur removal processes.

Q Is it true, Mr. Corey, that the western coal producers are not priced competitive with the Illinois coal producers at the present time?

A That is right. You mean western coal is more expensive delivered to Chicago, certainly, than Illinois coal.

Q How much more expensive, just generally?

[1660] A Well, it is at least 50 percent more and on a temporary basis as much as double, but we expect that when we get our unit train operations going from the west and the logistics worked out, we will have the price down to about 50 percent higher, more than Illinois coal.

Q Sir, in regard to the nuclear commitment of Commonwealth Edison Company, in your opinion is Edison is a better position to incorporate nuclear power in its system than a small electric utility?

A Yes, sir.

Q Sir, you stated that the first four of the six commercial sized units ordered by Commonwealth Edison,

Dresden 2 and 3, Quad Cities 1 and 2, were purchased from General Electric Company on a turn key basis, is that correct?

A Yes.

Q That means on a fixed price contract?

A Yes.

Q You also testified, did you not, sir, that the Dresden 2 plant went into operation last night, I believe?

A Well, it first produced first power last night. It is not, commercially speaking, in commercial service. A number of tests have to be done.

[1661] Q Is it true to say, sir, Dresden 2 is the first non-pilot nuclear power plant of Commonwealth Edison Company?

A I don't know—that requires a definition of pilot, and I don't consider Dresden 1 to be a pilot plant. I said it was a Model T, but it is full scale and not a prototype. That is what we normally think of when you say pilot.

It is just the first of its kind.

[1662] Q To put it this way, is Dresden 2 the first commercial size nuclear plant of the Commonwealth Edison Company?

A No, that is not right either, because when we ordered Dresden 1 in 1955, a 200,000 kilowatt unit was a commercial-sized unit.

I will put it this way. It is the first unit that we have ordered where the costs were competitive with coal.

Q Is Dresden 1, sir, producing power as cheaply as comparable-sized coal-fired plants?

A The answer is yes, after writing off $15 million of research and development costs which we were allowed by the Internal Revenue Service to write off. These were costs contributed by ourselves and some six or seven other members of the nuclear power group.

We obtained a ruling in 1955 for permission to write off these estimated excess costs and with these costs written off the over-all cost of generation at Dresden 1 is competitive with the cost of generation from similar-sized coal-fired plants of the same vintage, or, I should say,

which were in operation at the time Dresden 1 was ordered in 1955.

This was our benchmark, and it met the [1663] benchmark.

Q You have had some delay in Dresden 2, have you not?

A Yes.

Q Approximately how long has the delay been?

A Approximately a year. We expected it to be in commercial operation originally by the spring of 1969, and I guess, hopefully, it will be in commercial operation in the spring of 1970.

Q This delay has resulted in added expenses to General Electric, is that correct? It was a turnkey contract, wasn't it?

A It certainly was, but it has resulted in added expenses to Commonwealth Edison, too.

Q Approximately how much?

A I don't know, but if we measure it in terms of increased fuel costs it is pretty sizeable.

It is certainly measured in the millions of dollars.

Q Have there been some delays at Quad-Cities, too?

A Yes, all the nuclear units, all the first four units are delayed approximately a year. Excuse me; that is overstating it a bit, but between six months and a year due to a very well-known failure of Babcock & Wilcox [1664] to meet its schedules in fabricating reactor vessels in its Mt. Vernon Plant and this has been taken care of with respect to the Zion units by our purchase of an extra reactor vessel.

Q Sir, did Commonwealth Edison Company invite bids for coal-fired equipment in conjunction with its recent invitation for nuclear bids?

A No, because we were already building Powertown 5, and we were able to extrapolate very accurately, I think, what the cost of Powertown 6 would be.

The turbine prices are pretty well a matter of public knowledge, and the other components we are pretty well aware of what the prices are, and when we, as we have to do in a coal-fired station, do all the construction work ourselves, we have had a great deal of experience and

we are able to estimate these costs and have done so in great detail.

Q Sir, in your direct examination you testified that the cost per kilowatt hour at Powertown 5 was 215 a kilowatt hour. Would the increased cost be based on the acceleration, construction acceleration schedule there and also—would it be based on that?

A You misinterpreted my direct examination. I testified that Powertown 5's budget was $215 a kilowatt.

[1665] Q Yes, sir.

A Not per kilowatt hour.

Q Per kilowatt; excuse me.

A This is construction costs. Now, let's take it from there. What is the question?

Q Would that cost of $215 be accounted for partially because of the accelerated construction schedule at that plant?

A Very little of it, perhaps maybe $10, something like that, but it is not an important part of the cost.

Q Would this $215 cost be particularly ascribed to the work being done for possible Powerton 6 at that station?

[1666] A Yes, I think again we are talking something on the order of $10 for that figure. I don't have it precisely in mind.

It is in the record in our rate proceeding before the Commerce Commission, but I think it is about $10.

Q On direct examination, sir, Mr. Hedlund asked you regarding the coal contract for the Powerton station, and you testified this was with the Carter Coal Company, a subsidiary of Humble Oil & Refining Company.

It is a fact, is it not, that Humble is developing an underground mine in Macoupin County, Illinois, to supply coal for that generating station, is that correct, sir?

A I think so. I don't remember the county.

Q Do you have confidence that Carter Coal Company will make deliveries on that contract?

A Yes.

Q From that mine?

A Well, I have confidence that they will make deliveries. That is all that is of importance to me.

MR. CUSACK: May I confer with my colleagues, your Honor?

THE COURT: You may.

[1667] (There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Just two more questions, your Honor, if I may, please.

THE COURT: You may.

BY MR. CUSACK:

Q In reference to the coal reserve being acquired by Comonwealth Edison through PIAMCO, these reserves are located in Illinois, are they not?

A Yes.

Q Are they located in central Illinois?

A Some place in central Illinois. I am not precisely sure.

Q Would it refresh your recollection if I stated they were located near the town of Petersburg?

A You did a while ago, and I said I wasn't sure.

Q Is it a fact, sir, these are strip coal reserves?

MR. HEDLUND: I object to that, your Honor, on the same basis as before, that is, going into the minutia of these coal reserves. We have already established they are reserves and my objection is renewed.

THE COURT: Objection overruled. He may answer.

[1668] BY THE WITNESS:

A Well, we have no specific plans for mining coal. We do hope it will be strip.

BY MR. CUSACK:

Q Mr. Corey, who in your company would have the information as to the amount of reserves you are attempting to acquire in Illinois, coal reserves?

A Mr. Beeman.

Q Would Mr. Snyder also have this information?

A Yes.

MR. CUSACK: We have no further questions. Thank you very much, your Honor.

THE COURT: Any redirect?

MR. HEDLUND: Yes, your Honor, I will have redirect. I am mindful of the witness' convenience. If he would be agreeable to returning tomorrow, I would like to take him on redirect at that time.

THE WITNESS: I have made arrangements to—Mr. Ayres won't leave until 4:00 o'clock.

MR. HEDLUND: Then would you be willing to stay, your Honor?

THE COURT: Yes.

MR. HEDLUND: Could I have, then, about five minutes, your Honor?

* * * *

[1670] REDIRECT EXAMINATION

BY MR. HEDLUND:

Q Mr. Corey, I believe you testified on cross examination with respect to regulations on air pollution in the City of Chicago, and you mentioned that those were not the only regulations that were looming on the horizon, or something like that.

What other regulations were you referring to?

A The State of Illinois has some proposed regulations applicable to the Chicago metropolitan area.

Q Is that in connection with the Federal Clean Air Act of 1967 in the so-called Greater Chicago Interstate Quality Control Region?

A I think so.

Q Do you know what areas or what counties are included within at least the Illinois portion of that?

A I believe it is the area that is generally defined as the Chicago metropolitan area, which is, if my recollection is correct, Lake County, Cook County, DuPage County, Will County and possibly parts of McHenry County, though I am not sure. I am not sure whether it includes Kane County. I think it does.

[1671] THE COURT: You do not follow the Chicago Tribune's definition which carries it into Milwaukee, Iowa—

THE WITNESS: We stop short of the Twin Cities anyway.

BY MR. HEDLUND:

Q With respect to the question Mr. Cusack asked you as to who the principal competitors are at your coal-fired stations, directing your attention to the Ridgeland Station and its operation in the next year, who are the principal competitors for that station?

A The oil companies. The oil companies with international oil.

Q Isn't it true too, Mr. Corey, that that oil is going to cost you from a BTU delivered standpoint more than your coal cost in prior years?

A Yes.

Q Nevertheless, that is going to oil, is it not?

A Yes.

[1672] Q So it is fair to say that just taking the Ridgeland station, the delivered cost of energy per BTU is not the sole or indeed even the most significant factor in the competition between coal and, in this case, oil?

A That's right.

Q Is it not also correct, Mr. Corey, that as a result—let me back away from that for a moment. In the past you have burned a considerable amount of natural gas at Ridgeland, have you?

A Yes.

Q As a result of switching Ridgeland from coal to oil, you will be able to use this gas at other stations, will you not?

A Yes.

Q Will you use that gas at other coal-fired stations?

A Yes.

Q So that to that extent the gas will displace coal at these other coal-fired stations, will it not?

A Yes.

* * * *

[1678] RECROSS EXAMINATION

BY MR. CUSACK:

Q Mr. Corey, Commonwealth Edison Company does purchase some fuel on the basis of the lowest price per delivered BTU, does it not?

A Well, in the last six months, I would say our coal purchasing—the most important consideration in our coal purchasing has been the sulphur content. Once we get enough low sulphur coal to meet our needs, low sulphur coal that we can burn to meet our needs, that is, we certainly hope we will find our selves in a position where we can start picking and choosing and picking that burnable low sulphur coal which is cheapest. But at the moment, we are in the rather desperate situation of buying just about all the burnable low sulphur coal we can get.

Until we can assure the public and the Government that we are going to meet all of the requirements and meet all of our promises, we would just be buying whatever we could lay our hands on almost.

I hate to put it that way, because we obviously do consider price and have to, and that is what you are getting at, I am sure. I am not trying to quibble with you, but—

[1679] Q Well, in reference to GX Nugent Deposition 38, directing your attention to the mines in the Southern Illinois freight rate district, Commonwealth Edison Company does at the present time purchase coal produced in this district, is that correct, sir?

A I am not sure. Would you outline that district to me?

Q Yes. (Indicating)

A I don't know of any for sure. I should qualify an answer I gave to Mr. Hedlund, that I know we are buying some coal through O'Keefe and it is coming from various mines, and I don't know where the mines are. I think maybe some of them are in West Kentucky and some are in that district. I don't know. I am sure there are others here who do know. I don't.

Q In reference to the Kincaid station of the Commonwealth Edison Company, which is located contiguous to the Mine No. 10 of Peabody, are you at the present time burning high sulphur coal at that station?

A Yes.

Q And you do have stack precipitators on that station, do you not, which eliminate approximately 98 percent of the emission from those stacks?

A Yes. We have precipitators on virtually [1680] every, high efficiency precipitators on virtually every stack in our system.

Q In reference to the Powertown station, at Pekin, Illinois, you are burning high sulphur coal at that station, are you not?

A Yes.

Q And the new unit that is being built there at the Powerton 5 will consume high sulphur coal, is that correct, sir?

A That is correct. Assuming that we are able to develop an effective sulphur removal process by the time that unit goes in service or shortly thereafter.

Q And you do expect to develop that, do you not, sir?

A They are working very hard on it, yes.

* * * *

[1685] MR. CUSACK: Your Honor, at this time the Government moves the admission into evidence of GX-135, the petition before the Illinois Commerce Commission of the Commonwealth Edison Company.

THE COURT: Any objection?

MR. HEDLUND: No objection.

THE COURT: It may be admitted.

(The said document was received into evidence as Government Exhibit 135.)

MR. HEDLUND: I have just two quick questions.

THE COURT: All right.

REDIRECT EXAMINATION

BY MR. HEDLUND:

Q Just so the record is clear, electrostatic precipitators which you referred to in your cross examination by Mr. Cusack do nothing with respect to sulphur emissions or sulphur dioxide, do they?

A That's correct.

Q They are confined solely to particulates or what is known as fly ash?

A Yes, sir.

Q You mentioned your demonstration or pilot installation of a sulphur dioxide control device. That will not be completed for operation until the end of next [1686] year, is that correct?

A I think that is right. We will complete it as fast as we can. But we do not expect it to be more than a demonstration facility. We are still working. This is research and development in its present stage.

Q But as I understand it your target date for installation at this present time is about 18 months from now.

A That's right.

Q Is it not also a fact that right now you have no equipment installed on any of your generating stations to reduce or control the emission of sulphur dioxide?

A That's right. We have been experimenting with the addition of additives to the furnace so that the low sulphur coal we burn will not result in improper operation of the precipitators and will not result in increased dust emissions from the precipitators by reason of having not enough sulphur dioxide to cause proper ionization of the stack gases. So in that sense we are taking the steps necessary to make it possible to burn low sulphur coal without increased particulate emissions which might result otherwise.

Q By low sulphur coal, this would be with a sulphur content less than 2.5 percent?

A Less than 1 percent.

* * * *

[1693] JOHN D. AMES,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q Would you please, for the record, state your name and occupation.

A John D. Ames.

THE COURT: Spell your last name.
THE WITNESS: A-m-e-s.

BY THE WITNESS:

A I am a partner in the investment banking firm of Bacon, Whipple & Company, 135 South LaSalle Street.

BY MR. HEDLUND:

Q Mr. Ames, if you will, try to keep your voice up. That is not a microphone; that is simply a device for a tape recorder.

A I will; I am sorry.

Q Mr. Ames, could you please give me a brief description of your educational and business background.

A I went to preparatory school in Asheville, North Carolina, and to Princeton University where I [1694] graduated in 1928.

From 1929 to 1952 I was publisher of the Chicago Journal of Commerce. At that time we sold the Chicago Journal of Commerce to the Wall Street Journal.

I then became a general partner of Bacon, Whipple in, I think, 1952 or 1953 and have been there ever since.

Q Would you give us the names, sir, of some of the boards of which you have been a director in the last 15 or 20 years.

A Well, of course, there is United Electric Coal. Up to last year I was a director of the Wallace Murray Corporation. I am presently a director of the Pyle National Company here in Chicago, of the Homeowners Insurance Company here in Chicago, and the Clark Equipment Company of Buchanan, Michigan.

Q When did you first become a director of United Electric?

A In 1948, I believe, 1948 or 1949; I am not sure which.

Q And for how long did you serve as a director for United Electric?

A Until 1966.

Q Approximately or almost—

[1695] A 17 years.

Q When you became a director for the first time, who was president of United Electric?

A Mr. Frank Kolbe.

[1696] Q And he continued as a director, did he, I mean as president until 1959, is that correct?

A That is correct, yes, sir.

Q And who was president after 1959?

A John Morris.

Q While you were a director, I mean.

A Yes.

Q Do you recall back in 1955 whether or not the company, that is United Electric, was involved in merger discussions with any other company?

A I believe there was some talk at that time about a merger with Truax-Traer.

Q Do you know why at that time United Electric had entered into such negotiations or such discussions?

A I believe it was generally thought by the management and the board that a merger of some kind would be helpful to United Electric to gain additional reserves.

Q Do you recall in 1959 when representatives of Material Service and Freeman came on the board of United Electric, do you?

A I remember.

Q Can you tell me at that time and following whether there was any discussion by you with others [1697] in the company or any general discussion at which you were present where the subject of the possible merger between Freeman and United Electric took place?

A I don't remember any discussion except a very short conversation I had with Mr. Reuben Thorson.

Q We have heard of that discussion before. Can you tell me what you recall of that discussion?

A Mr. Thorson and I were walking back from a meeting, and he said that he thought it would be in the best interests of United Electric Coal if they merged with Freeman.

THE COURT: About when was this conversation?

THE WITNESS: In 1960. That is a little bit of a guess. I can't tell whether it was the end of 1959, 1960 or early 1961.

BY MR. HEDLUND:

Q Mr. Ames, do you recall whether or not prior to 1959, that is, prior to the Material Service, Freeman people coming on the board, whether there were any discussions at board meetings or any discussions that you might have had with management that indicated any interest by United Electric in becoming a deep miner?

A No, I had no such conversation. I believe United Electric had an experience with deep mining in [1698] western Kentucky that didn't turn out very well, and I don't think the management at the time to which you refer was really interested in deep mining.

Q What about after 1959; do you recall any discussions at the meetings of the board of United Electric or in your discussion with management, whether the subject of deep mining by United Electric ever came up?

A It did come up, and I think the reason it was given consideration was on account of the—how shall I say—talent for deep mining that the men of Freeman Coal had that were also members of the United Electric board.

Q Would you give me your best recollection, Mr. Ames, as to what the company was doing or what efforts United Electric were trying to make with respect to acquiring additional reserves after Mr. Nugent came on the board of United Electric and became chairman of its executive committee?

A Well, I think that one of the things that was uppermost in everybody's mind at that time, including Mr. Nugent's, was the fact that United Electric should somehow or other obtain some more reserves; and the matter was discussed, and I don't know how to say it, [1699] but I think regularly or at regular intervals.

Q Did you have enough contact with the company to form an opinion as to whether the reserve activity of United Electric was greater or lesser or about the same after Mr. Nugent came on the board than before?

A I think I would have to say it was greater.

[1700] Q Mr. Ames, the Government is contending in this case or has contended that following the election to

the board of United Electric of the representatives of Material Service and Freeman, these directors hampered and held back United Electric in acquiring additional coal reserves.

Mr. Ames, I ask you in your opinion is there any substance to such a charge?

A There is none.

Q From 1959, that is again upon the election of the Material Service-Freeman representatives, were you aware of any attempt or desire on the part of Mr. Nugent and the other Material Service-Freeman-General Dynamics directors to unnecessarily conserve United Electric cash or to hold back United Electric in any way from making needed capital improvements or for improving the financial basis, the equipment basis of the company?

A If I recall correctly, there was a great deal of money spent for capital improvements—I can think of two wheels, and I can't name much more—than there was in the previous five or six years, and I think I would have to answer that question that there was no indication that I could see that these directors were in any way trying to prevent capital expenditures or [1701] to hold back the growth of the United Electric Coal Company.

Q Mr. Ames, you served as a director up until 1966, that is up until the tender offer for the balance of the shares of stock, did you not?

A Yes.

Q Between 1959 and going up until that time, did you ever see any evidence or have any suspicion that the Freeman-Material Service or General Dynamics directors were trying to run United Electric for the benefit, not of all the stockholders, but for the benefit of Freeman-Material Service or General Dynamics?

A I didn't see any, and I think I would have been pretty upset if I had seen some.

Q Are you absolutely sure that you saw none?

A Yes, I am absolutely sure.

Q Going back to 1959, Mr. Ames, do you know whether or not Mr. Kolbe was in favor or opposed to the re-

structuring of the board that took place, that took place in that year?

A Can I give an opinion?

Q If you will also indicate the basis for that, yes.

MR. CUSACK: The Government objects, your Honor. [1702] Opinion evidence is not proper in response to that question.

THE WITNESS: I was wondering.

THE COURT: The way the question is framed, the objection is sustained.

BY MR. HEDLUND:

Q Mr. Ames, do you know of your personal knowledge whether Mr. Kolbe was opposed or in favor of the restructuring of the board in 1959?

A I would have to answer no.

Q Mr. Ames, would you give me your opinion, please, as to the competency and ability as a coal executive of Mr. Frank Nugent?

A Well, I thought he was excellent.

MR. HEDLUND: I have nothing further, your Honor.

THE COURT: You may cross examine.

CROSS EXAMINATION

BY MR. CUSACK:

Q Mr. Ames, is it a fact that from 1959 to 1966 when United Electric was merged into General Dynamics that United Electric made substantial progress?

In order for you to answer this question, I hand you what is in evidence as GX Nugent Deposition Exhibit 31 at pages 12 and 13.

• • • •

[1707] Q To refresh your recollection, sir, do you recall United Electric acquiring coal reserves at the Round Prairie Field?

A Yes, I do.

Q Isn't it a fact, sir, that while you were a director of United Electric, United Electric did acquire a substantial amount of coal reserves at the Round Prairie Field?

A I don't know. I don't know the number or how much.

Q Sir, based on your testimony on direct examination in regard to whether or not the General Dynamics directors on the board of United Electric were using United Electric for its own purposes, I ask you whether or not it was the intention of the board of directors of United Electric while you served to the board to turn over to Freeman Coal the corporate opportunity of mining the Round Prairie underground coal reserves?

A No.

Q Isn't it a fact, sir, that you were on the board of United Electric there were plans for United Electric to develop in the future its underground coal [1708] reserves?

A With the help of Freeman.

Q And Freeman would be compensated, would it not?

A This was my understanding.

Q And United Electric also could, could it not, have developed its underground reserves with the help of another underground company, could it not?

A I don't see that that would have been as good as doing it with Freeman.

Q Would it have been as good had United Electric acquired underground personnel to acquire the reserves without Freeman?

A That wasn't necesary. Freeman was there.

Q If Freeman had not been there, Mr. Ames, do you believe it would have been likely that United Electric on its own would have developed its underground coal reserves?

A I do not.

Q On what do you base your opinion, sir?

A Well, Mr. Kolbe, and even Johnny Morris—they had no leaning toward underground coal. They didn't know very much about it. As I said before, they had one bad experience, and I saw no indication or would have

no idea that without Freeman they would have gone independently by themselves.

[1709] Q Is it a fact, sir, that Mr. Kolbe felt that the future of strip mining was bright and that it would not be necessary for United Electric to go into underground coal?

A I think, if there were plenty of reserves, that future for strip mining would have been good, but there weren't plenty of reserves.

Q On what do you base this opinion, sir?

A Well, the numbers I think speak for themselves.

Q Did you ever investigate yourself the availability of strip coal reserves in Illinois?

A The only information I got was information given to me at directors meetings by Mr. Kolbe and subsequently by Johnny Morris and Frank Nugent.

Q Did Mr. Kolbe ever indicate to you that in his opinion United Electric would not be able to buy sufficient strip coal reserves to remain in business?

A He never went that far, but there weren't any strip coal reserves left. They were all gone.

Q Who stated that to you?

A Well, somebody on the board. Some of the management.

Q Did Mr. Nugent state that to you?

[1710] A I can't remember. I know every effort was made to get them at all times, first by Mr. Kolbe and then more intensely by Mr. Nugent.

Q Do you recall a meeting of the board of directors of United Electric where the board stated that the management could only buy strip coal reserves at the Industry Field at farm prices?

A Yes, I do.

Q Wasn't this proposed by Mr. Nugent?

A No, it was Mr. Kolbe, I think. He would be willing to do that, he said, if he didn't have to pay more than farm prices. The record will so show, I think. I could be wrong on it, but that is my recollection.

Q You voted, did you not, sir, for the acquisition by United Electric of strip coal reserves at the Industry Field, is that correct?

A Well, the record is there. I can't remember.

Q Mr. Ames, prior to your testifying today, did you read testimony in this trial of Mr. Thorson?

A Yes.

Q Who gave you that testimony?

A Defense counsel.

Q Mr. Hedlund?

A Yes.

• • • •

[1715] Q Mr. Frank Kolbe serves on the board of directors of the Clark Equipment Company at the present time with you, is that right?

A That's correct.

Q And Mr. Kolbe is on the executive committee of Clark?

A That's correct.

Q And you served together in that board?

A Yes.

Q In regard to the Truax-Traer merger, isn't it a fact that the primary motivation for the merger of Truax with United Electric in 1955 was that their mines were very close together, both in Fulton-Peoria and in Perry County near the Fidelity Mine, and that a merger of these two companies would create great operating savings?

A That was discussed.

Q Wasn't this the prime reason for that merger discussion?

A Well, I wasn't in on any of it. All we heard were results or progress or lack of it. I can't tell you the reasoning behind it, except that it would, as I stated once before, increase the total reserves of the combined companies.

• • • •

[1717]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,

Wednesday, April 15, 1970,

10:50 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM
DR. PETER STEINER,

• • • •

[1723] DARIC N. MILLER,

called as a witness by the Government in rebuttal, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. FUTTERMAN:

Q Would you please state your name and spell your first name, please.
A Daric Miller; D-a-r-i-c.
Q What is your business address, Mr. Miller?
A 818 Kansas Avenue in Topeka, Kansas.
Q By whom are you employed?
A Kansas Power & Light Company.
Q What is your occupation?
A I am manager of electric production.

• • •

[1726] Q How many tons of coal did Kansas Power & Light [1727] Company consume in 1969?
A Something like about 140,000 tons.
Q How would you characterize this coal in terms of its sulphur content?
A This is southeast Kansas bituminous which is, generally speaking, in the three and a quarter, three and a half percent sulphur area.
Q What other forms of energy besides eelctricity does Kansas Power & Light Company distribute?
A We are in the transmission as well as the distribution business of natural gas.
Q Does Kansas Power & Light Company have any base load generating stations under construction at the present time?
A Yes. We are in the process of building a unit of about 430,000 kilowatt capacity as an addition to the Lawrence power plant.
Q When will this plant be on line?
A The spring of 1971.
Q When this plant is completed, what percentage of your total generating capacity will it represent?

A It is about 30 percent.

* * * *

[1729] Q Why did Kansas Power & Light Company not [1730] choose oil as the sole energy source for the new Lawrence unit?

A We haven't been able to find that much oil in the state of Kansas that we can buy at a respectable price level.

Q When you decided to burn coal as one of the primary fuel sources at the new Lawrence station, were you concerned at all about stack emissions?

A Yes.

Q Which emissions were you concerned about?

A Well, we were initially, obviously, concerned about particulate emission.

In reading the trade journals and keeping our ears open and our eyes open, we were of the opinion that if something could be had for control of SO_2, it might be time to spend money and have the money well spent.

Q Was there any state or local legislation governing air quality or limiting stack emissions at the time the decision to burn coal was finalized?

A No, I don't think so.

Q Was any contemplated by the State of Kansas?

A Yes. The State was involved in setting up an air quality conservation law that looked like it was going to set forth standards to become effective some- [1731] time about the first of 1971.

Q What types of air pollution control systems, if any, were originally scheduled to be part of this facility?

A We initially laid the plant out with electrostatic collectors and a respectably tall concrete stack.

[1732] Q How much of a capital investment would a system incorporating electrostatic precipitators and a tail stack have required had it been installed?

A The system to include the ponds and the dust and the ash-handling facility in our economic study at about that time was in the area of about $3 million.

Q What kind of an air pollution control system, if any, will this facility contain when it is completed?

A It will have a Combustion Engineering air pollution

control system on it that has the ability to collect particulate as well as SO_2.

Q Why did you choose this system?

A In our examination at that time, it was really the only system that we could find that could do or was proposed that could do anything other than just remove particulate.

Q What is the system designed to accomplish?

A Its guaranteed accomplishments are 99 percent removal of the particulate and 83 percent of the SO_2 in in the flue gas in burning our southeast Kansas coal, which is something in the area of 12 percent ash and 3½ to 3¼ percent sulphur.

Q Did Kansas Power & Light Company install the Combustion Engineering air pollution control system on any [1733] of its other coal-burning units at Lawrence?

A Yes. We have an installation on an existing 125,000 kilowatt unit that we added it to.

Q How much of a capital investment did the stack emission system incorporating the Combustion Engineering air pollution control system require for the new unit at Lawrence?

A In trying to separate out the dollars between the two systems, at the time we made this purchase, we looked in the area of $3 million.

Q Were you able to use any of your existing equipment at the Lawrence Station in the Combustion Engineering air pollution control system?

A Is this question in terms of the new unit?

Q Yes, sir.

A Of course, we already had the ground at the site of which we utilized some of the ground area. The major items of equipment that we did use, we permanently borrowed two coal pulverizers and their appurtanence equipment, which includes the bunkers so that we could grind the limestone in those two pulverizers and inject it into the steam generator in the new unit. Had we not had them, we would have had to bought along with this combustion system some limestone grinding capacity.

[1734] Q How much would that have cost you if you had to purchase that equipment?

A I would suspect something in the area of perhaps $400,000.

MR. HEDLUND: I am sorry, your Honor.

THE WITNESS: $400,000.

THE COURT: That is not an amplifier.

THE WITNESS: Excuse me.

THE COURT: It is for a tape recorder.

BY THE WITNESS:

A I would suspect in the area of $400,000.

BY MR. FUTTERMAN:

Q Could you very generally describe the mechanics of the Combustion Engineering air pollution control system?

A We are pulverizing limestone and blowing that limestone into the furnace to calcine the limestone to a reactive material, an alkaline reactive material, so that we can collect and precipitate and collect the SO_2 in the scrubber and dispose of it in the pond.

[1735] BY MR. FUTTERMAN:

Q Prior to the Kansas Power & Light Company's commitment to purchase stack emission control devices, did you conduct any tests of the Combustion Engineering system?

A We did run some tests on the 125,000 kilowatt unit there at the station.

Q Where and how did you conduct tests?

A Our main process of conducting the tests was to determine if we could put limestone in the furnace with the fuel and end up with the exit pass from the boiler, with the limestone in a reactive state that when the scrubbers were added, it was there available to be used for SO_2 removal.

Q What did Kansas Power & Light Company conclude after conducting these tests?

A Well, after we finished those tests and we evaluated our economics and looked at what we had available for stack emission control, we decided to purchase the Combustion Engineering air pollution control system for that 430,000 unit.

We also decided to purchase a like system for the existing 125,000 kilowatt unit, the particular purpose being that the Lawrence station now was going [1736] to become a major coal-burning plant on our system, to provide stack emission control on the 125,000 kilowatt unit, and also to learn how to operate, and what the bugs were, and what the problems were in this Combustion Engineering system, so that by the time we came to the 1971 start-up date on the 430,000 unit, we could assure ourselves that we had a system that, in our opinion, would be reliable to operate at that time.

Q Is the 125,000 megawatt unit containing the Combustion Engineering system in service at the present time?

A Yes.

Q When did it go into service with the Combustion Engineering system?

A The unit initially went into service in the Spring of 1968. We put the air pollution control system in service on the unit in December of 1968.

Q Have you encountered any insurmountable problems with the 125,000 megawatt unit, to the present time?

A We encountered problems from the day we started it up. Up to this juncture, I don't think that we have encountered any insurmountable problems. [1737] We have labored rather seriously with the system in an effort to find out how it works, and have modified the system somewhat. We have changed some of the materials that were initially installed in the system to where we can install the scrubber system on the new unit with those modifications as originally planned.

Q Do you believe that you have had sufficient operating experience with your Combustion Engineering air pollution control system at Lawrence to expect reliable operation with the same system on the 430,000 megawatt plant?

A From what our experience has been, yes, we do expect to have reliable operation out of the 430 unit when it goes on the line next spring.

Q At the time Kansas Power & Light Company decided to purchase the Combustion Engineering air pollu-

tion control system, to your knowledge was there any other sulphur dioxide emission control system available for sale?

A We are not aware of any that were available at that time.

[1738] BY MR. FUTTERMAN:

Q To your knowledge at the present time are other manufacturing companies engaged in the technology of stack gas emission control?

A From what we read in the trade journals and listen, yes, I'm sure there are.

Q Are you as familiar, less familiar, or more familiar with other stack gas emission control systems as you are with your Combustion Engineering air pollution control system?

A We feel like we have a rather serious familiarity with the Combustion Engineering air pollution control system, but we are not familiar with the others.

MR. HEDLUND: I'm sorry, I did not hear that answer.

THE COURT: Read the answer.

A (Read by the Reporter.)

BY MR. FUTTERMAN:

Q Has your Combustion Engineering air pollution control system performed in accordance with its guarantees?

BY THE WITNESS:

A We have made the guarantee performance from the unit, yes.

Q Have members of the trade expressed any interest in your Combustion Engineering air pollution control system?

[1739] A We have had a lot of visitors and a lot of people talk to us on the phone concerning the subject, yes.

Q What will be the sulphur content of the coal burned at the Lawrence, new Lawrence unit?

A It is contemplated, in that it is coming out of the same mine as to what we are burning coal now, that we

are in the three and a quarter, three and a half percent sulphur area.

Q Subsequent to the operation of the 430 megawatt plant at Lawrence in April 1971, when will your next base load expansion occur?

A Our present plans as far as base load addition look like about spring of 1978.

Q How large a plant are you contemplating at the present time?

A We haven't tied down the size, but we would expect it will be at least as large as the 430,000.

Q What fuel or fuels do you expect will be consumed in this plant?

A Well, again in looking at it with our pencil it doesn't look like nuclear is economic at that size range, so we expect that we will have a choice between gas and coal, as far as primary fuel.

[1740] Q Do you anticipate that coal will be burned at the plants to come on line in 1978?

A I would expect that coal will be the major fuel that is burned in that plant in 1978.

Q Are you installing a stack gas emission control system on that plant?

A I think, in looking at the regulations we are obliged to operate under, we will, if we burn coal, be obliged to control stack emissions.

It would appear that we may even have a choice as to what kind of a system we do it with.

Q Do you believe that the Combustion Engineering air pollution control system which is being installed on the 430 megawatt plant will do the job that is designed to do?

A From our operating experiences on the 125,000 kilowatt unit, I don't really think there is any question but what it can perform.

• • • •

CROSS EXAMINATION

[1769] BY MR. HEDLUND:

• • • •

Q And about how high?

A It extends upward something, it looks like about 100 or 120 feet.

Q Something similar to, say, a 10 or 12-storey building?

A Yes, a rather small one.

Q Would you give me, sir, your best opinion—let me approach it this way.

If we take the figure of $3.5 million that you have testified to as to the end cost of your two units plus the $400,000 that you were able to save, or the reproduction costs of the pulverizers, you get to $3,900,000, what would be the approximate kilowatt cost then, the capital kilowatt cost for these two units?

A Well, we are looking at a net output between the two of them of something like 550,000 kilowatts. If we add the $400,000 worth of equipment that we did not have to spend money for, we end up with a number then that looks like about $7 a kilowatt.

Q $7 per kilowatt?

A Yes.

Q In your opinion, does that represent, if one were to construct such a device today, does that $7 per kilowatt represent what you believe it would cost today [1770] on a kilowatt basis?

A May I interpret that question to mean if we were repurchasing this today for our system, what could we buy it for?

Q That is correct, and without regard to savings that you would be able to make because of prior acquired equipment or land for that.

A Yes, and knowing full well that we have some modifications that we would then have to be buying today that we did not have at the time of our purchase.

Q Right.

A I don't know the answer to that question. I will give you an opinion of what I think the magnitude of that number might be.

Q Yes, sir.

A I would guess something in the area of $8, $8.50, today.

Q That is $8 to $8.50?

A Today.

Q Today, per kilowatt?

A Yes.

Q Would you give me, sir, your best estimate of what your owning and operating costs per ton of coal will be with respect to the continued operation of these [1771] two units?

A In our normal manner of looking at that question, we do not include owning cost as an operating cost. We are expecting, and from what we have demonstrated, we would look at an operating cost of somewhere between a cent and a half and two cents per million BTU. Our coal is essentially 25 million BTU. So, you can equate that on a ton of coal basis for me.

Q In your judgment, would an estimate of Combustion Engineering's system's owning and operating costs at approximately 90 cents a ton, applied to coal similar to which you are purchasing, be a reasonable estimate? I am including there both owning and operating costs.

A We are talking about 90 cents a ton, we are talking about essentially our coal?

Q That is right.

A As far as its BTU content?

Q That is correct.

A We are talking about limestone and we are talking about power and we are talking now about fixed charges of owning?

Q No. We are talking about both fixed and operating costs, limestone maintenance—

[1772] A Including the limestone at this juncture?

Q Yes.

A I think that the 90 cents a ton is in a reasonable area, correct, yes.

• • • •

[1778] Q You are aware, are you not, that Combustion Engineering has a similar limestone wet scrubbing system [1779] installed at the Meramec plant of Union Electric?

A Yes, sir.

Q Have you visited that operation?

A I visited it before it went in service.

Q Pardon me?

A I visited it before it went in service.

Q Have you visited it subsequently?

A No, sir.

Q Have you had any conversations subsequently with anyone from either Combustion Engineering or Union Electric with regard to that system?

A Oh, about third-hand basis.

Q You do know, do you not, that they have had substantial operating problems with respect to that?

A I have heard they have.

Q You are aware, are you not, Mr. Miller, that a spokesman for Combustion Engineering, in reference to the unit at Union Electric, stated in the summer, I believe it was, of 1969, that "At the present time the process is not a commercially acceptable unit"?

A We are talking about the one at St. Louis?

Q That's correct.

A I haven't tried to read all the material on the St. Louis one.

[1780] Are you aware that such a statement was made by Combustion Engineering?

A I have, again, second- and third-hand information of that statement, too.

Q Mr. Miller, is it fair to conclude on the basis of the decisions made by Kansas Power & Light with respect to the installation of these devices, and with respect to the operating experience that you have had, that sulphur removal devices are now commercially available, commercially operable for all, or even most of the utility stations in this country?

A Let me attempt to answer your question in this manner:

I think a sulphur removal device, as we understand ours, which is really the only one we can talk about, is a system you have to engineer and design to a specific environment of plant.

Beyond that, I don't know that I know the answer to your question, because I don't know the environment that you are talking about putting them in in a specific enough nature to answer that question.

• • • •

[1782] Q At the present time, Mr. Miller, to your knowledge—let me back up, if I may, your Honor. I should be able to do this very shortly.

[1783] In terms of your prediction on operating costs of, I believe you stated, a cent and a half to two cents per million BTU, it is the fact, is it not, that you really don't have a good handle on what your maintenance costs are going to be with respect to the 430—

A As far as long-term maintenance costs, no, we do not have.

Q Other than the Combustion system that has been installed at Union Electric, and has been installed at Kansas Power & Light, and is to be installed on your 430 megawatt station, are you aware of any other installations of such a system in the country, either presently existing, or under construction?

A No, sir.

Q Is it a fact, is it not—before I ask that question, Mr. Miller, could you give me your opinion of what the megawatt size is of an average base load unit being installed today?

I know that is difficult to answer unless you take it on a system by system basis. But, say, for other than such systems as Commonwealth Edison or American Electric—

A Well, I think it is really only fair to say [1784] that I don't know anything about Commonwealth Edison or American Power.

Obviously, the size of installation of a base load unit that I know something about is our own, which is 430,000 kilowatts, which would be those in the reasonably immediate area around us, which are up in size now, as far as installation in service, to 500,000 kilowatts.

* * * *

[1827] FRANK NUGENT,

called as a witness by the defendants herein, having been first duly sworn, was examined and testified as follows:

MR. HEDLUND: As your Honor is aware, Mr. Nugent's deposition was taken for some three or four days.

THE COURT: Yes.

MR. HEDLUND: I do not intend without reason to recross ground covered at that time, nor do I intend to

go into a number of subjects with Mr. Nugent about which he is definitely familiar but which there is already a considerable body of evidence and which I feel would be repetitive.

THE COURT: All right.

DIRECT EXAMINATION

BY MR. HEDLUND:

Q For the record, please, sir, would you state your name and present occupation.

BY THE WITNESS:

A Frank Nugent; Group Vice President of General [1828] Dynamics, President of Freeman Coal Mining and President of United Electric Coal Company.

Q Would you please, sir, for me please briefly describe your background and experience in the coal industry.

A I have been in the coal mining busines for about 50 years starting—

MR. CUSACK: Your Honor, may I object here.

I think it would save time. I asked Mr. Nugent quite extensively in regard to his qualifications. It is in the deposition. I really think it is repetitive. It is in evidence. I think I went into it with a fine-tooth comb. I really don't think it is necessary we all know Mr. Nugent's qualifications.

THE COURT: You agree to his qualifications and background as stated in the deposition?

MR. CUSACK: I certainly do, your Honor.

MR. HEDLUND: I did not mean to go into this with a fine-tooth comb but just to hit the high spots in terms of what he was—

THE COURT: Well, it is in the deposition. Let's proceed from there.

BY MR. HEDLUND:

Q Mr. Nugent, when did you first become affiliated [1829] with Freeman Coal Mining Corporation?

A November—Well, let's see. In November 1921 with the Burton Coal Company, and the Burton Coal Company acquired the Freeman Coal Mining Corporation in August of 1922.

[1830] Q I gather that since 1922 you have been with Freeman Coal Mining Corporation as well as others?

A Yes.

MR. HEDLUND: I do not believe this is in the deposition, your Honor.

BY MR. HEDLUND:

Q Would you please describe your function for General Dynamics in your capacity as group vice president other than your responsibilities directly with respect to United Electric and Freeman Coal Mining Corporation.

A The president of Material Service and the president of Marblehead Lime report to me. I am associated with the Asbestos Corporation in Canada as a member of the board.

Q You became, did you not, president of United Electric upon the retirement of Mr. John Morris?

A Yes, sir.

Q How long did you serve in that capacity?

A Mr. Morris retired in November of 1966. I took over as president to January 1st, 1968.

Mr. Camicia was president from January of 1968 to April 1st of 1969.

I again took over on April 1st, 1969.

Q You have continued to serve in that capacity since?

[1831] A Yes, sir.

Q Mr. Nugent, I hand you what has been received in evidence as Defendant's Exhibit 48, and hand it to you, which is a letter, a printed form letter, dated December 15, 1954, on the letterhead of the Chicago Wilmington & Franklin Coal Company to the stockholders of CW&F Coal Company, and signed by George B. Harrington as president.

Without meaning to characterize the document, but in the interest of time, I note that this is in effect an offer for the tender of shares of the CW&F Coal Company. I note that in the third paragraph, referring to an offer that has been made, it states:

"Understandably the other party to these discussions has not yet wished to be disclosed."

I ask you, if you know, who the other party was to these discussions and, in effect, who is going to acquire the stock for which this offer was being made?

A The Empire Building Corporation. I think that was the proper corporate name.

Q Who owned Empire Building Corporation?

A The Crown family.

Q Did they also at the time own Material Service?

A Yes, sir.

[1832] Q then, in effect, did they also at the time own Freeman?

A Yes, sir.

Q I note that this document is dated December 15, 1954.

Do you know whether or not the stock sought by this offer was, in fact, acquired by Empire Building Corporation or by the Crowns?

A Yes, sir, it was.

Q Do you know when?

A The closing was on December 31st, 1954.

Q At that time, had they acquired all or substantially all of the stock of CW&F?

A Substantially all.

Q In 1954, CW&F owned and operated coal mines, did it?

A Yes, sir.

Q In the state of Illinois?

A Yes, sir.

Q Following the closing, that is, at the end of the year 1954, and on indefinitely into the future through and including 1960 or 1961, were the mines of CW&F, in fact, operated by Freeman and was the coal produced at those mines, in fact, sold by Freeman?

A The mines were operated by Freeman and the coal was sold by Freeman.

[1833] Q There is some evidence in this case—again, without attempting to characterize it— that it was not until 1958 or 1959, or whatever the record does show, that certain of the properties of CW&F were not until

that time actually transferred to Freeman or to any of its affiliates.

Could you explain to me, if you know, why there was that delay?

A There were some tax considerations. But in addition to that, the Orient No. 2 Mine, which had been a large hand-loading mine and at one time one of the largest hand-loading mines in the country, had a bad unemployment experience. Freeman sought not to acquire that unsatisfactory experience. That was the reason for the delay.

Q Is it true in point of fact that from January 1, 1955 forward, other than the qualifications that you have just mentioned, that CW&F and Freeman were, in fact, one coal mining company?

A Yes, sir.

Q Would you tell me briefly, Mr. Nugent, the extent to which you participated in the transactions referred to in Defendants' Exhibit 48?

A I believe I called it to Henry Crown's attention [1834] originally and initiated the negotiations, and I carried forward the negotiations with George Harrington.

Q Is it fair to say that it was your idea that, in effect, Freeman acquire CW&F?

A Yes.

MR. CUSACK: Your Honor, that is in the deposition very clearly. There is no dispute on that matter. Mr. Nugent said it before.

MR.HEDLUND: The Court is aware, your Honor—if I may reply?

THE COURT: Yes.

MR. HEDLUND: The Court is aware that there is a dispute between the parties of substantial sort as to when CW&F was acquired by Freeman.

THE COURT: He may answer. That is not going into it in any great detail.

MR. HEDLUND: I believe he answered, but could we have it read back?

THE COURT: Read the answer.

A (Read by the Reporter.)

BY MR. HEDLUND:

Q Mr. Nugent, when, if you recall, did the Crown interests or Material Services first acquire stock in the United Electric Coal Companies?

[1835] A 1954.

Q Could you briefly describe the circumstances surrounding the initial purchase?

A Well, initially, I think we acquired a small block of stock, really, with no serious intent, perhaps. But as I got to studying the reserve situation, it occurred to me that this would be a worth-while acquisition because of the shortage of reserves and because we did have reserves that would back up that property. I could see that the company was eventually going to go into liquidation.

[1836] Q Following—how soon was it after 1954, if you recall, that your interest changed from one of, I believe you described it as no serious intent, or to one of looking at the situation more closely?

A Well, we bought the first block of stock rather quickly, and I began to think about it just as soon as we acquired the stock.

Q Again, in 1955, could you describe and, say in a period 1955 to 1958 generally, describe what sort of contact you maintained, or what sort of inquiries you would make with respect to the operations and the management of the company of United Electric?

A Well, I had some reservations about the top management, and I watched it very closely on a day-to-day basis, I would say.

Q Do you recall when for the first time you began, if you did, discussions with Johnny Morris concerning underground or deep mining possibilities that had come to the attention of United Electric?

A Well, I don't think I originated those discussions. I thought that Morris brought the deep mine operations to my attention perhaps in the year of 1958, at first.

Did these conversations, did this type of [1837] communication between you and Mr. Morris, or others at United Electric, continue thereafter?

A Yes, sir, it did.

Q If you recall, at Board meetings—let me stop there.

Just for purposes of trying to develop this logically, you went on the Board of United Electric in what year?

A 1959.

Q And you also became Chairman of its Executive Committee at that time?

A Yes, sir.

Q Subsequent to 1959, at both Board meetings—or, at Board meetings or at Executive Committee meetings, was there discussion of deep mining possibilities by United Electric?

A At times, yes.

Q And to what extent would you participate in those?

A Well, I would say that I expressed my views each time a deep mining operation came to the attention of the Board.

Q If I may take a somewhat arbitrary date, but nevertheless, starting with 1958, had you at that time [1838] formed an intention that United Electric and Freeman would ultimately merge?

A Yes, sir.

Q Did Colonel Crown at that time—

A Yes, sir.

Q —or shortly thereafter express a similar intention?

MR. CUSACK: Objection, your Honor. He is asking the state of mind of not only of the witness back in 1958, but of Henry Crown back in 1958.

It is hearsay. It is not proper questioning, and the Government objects and moves to strike his answer in regard to his state of mind in 1958.

THE COURT: Objection sustained.

MR. HEDLUND: Your Honor, I asked if this witness saw any expression of that intent, not as to whether or not Colonel Crown had the intent.

THE COURT: Well, "any expression."

To put it plainly, did he ever make a statement to that effect, or was there any discussion?

BY MR. HEDLUND:

Q Were there any discussions or statements between you and Henry Crown in which Mr. Crown indicated

his intention that there would ultimately be a merger [1839] of Freeman and United Electric?

A I think I can say that I suggested to Henry Crown that there should be a merger; and Henry Crown was in agreement.

MR. CUSACK: Your Honor, the Government objects and moves to strike, unless the witness lays a foundation of where, and when.

THE COURT: Set the dates.

BY MR. HEDLUND:

Q Do you recall when that—do you recall first of all when, if we can describe that as a meeting, when that statement was made, and who was present, and where it was made?

A I don't recall that anyone was present. But the conference took place in Henry Crown's office.

[1840] Q And when would that have been?

A In 1958. And I can't set a month for you.

Q If that was the intention, Mr. Nugent, in 1958, or at least yours, my next question is why did this merger not in fact complete itself in terms of all of the stock of United Electric until 1966?

A About that time—

Q I'm sorry, sir. If you say "about that time," would you indicate which time you are talking about?

A About 1958.

Q Yes, sir?

A About that time, and in the fall of 1958 we started merger discussions with General Dynamics. They failed before the end of the year of 1958. However, we continued to think about the matter, and the merger discussions were again resumed with General Dynamics people in 1959. We were quite busy with General Dynamics, a sizeable merger, and we gave United Electric no thought during that period.

Q What about 1960?

A After 1960, as you may recall, General Dynamics had some problems with commercial airplanes, and again other things were on our mind, and we just didn't get around to it promptly.

Q Did Colonel Crown, to your knowledge—and [1841] for that matter, General Dynamics—continue to purchase stock after 1960 in United Electric?

A Yes, sir, they did.

MR. HEDLUND: Do you have Maguire's Deposition Exhibit No. 1?

MR. CUSACK: Yes, I have one.

MR. HEDLUND: Do you have a copy for the Court?

(Mr. Cusack tendered a copy to the Court.)

MR. HEDLUND: Your Honor, may I interrogate the witness from over here, due to the shortage of copies?

THE COURT: Yes, you may.

MR. CUSACK: May I join you?

THE COURT: You certinly may.

BY MR. HEDLUND:

Q Mr. Nugent, I show you what has been received in evidence as Maguire Deposition Exhibit No. 1, which is a document dated November 24, 1959, to the shareholders of General Dynamics Corporation requesting the shareholder's proxy, proxies to vote in favor of the merger of Material Service Corporation and General Dynamics.

Is this merger to which you have just been testifying?

A Yes, sir.

MR. CUSACK: May I say for the record that this is [1842] a Government exhibit?

THE COURT: You may.

BY MR. HEDLUND:

MR. CUSACK: Thank you, your Honor.

Q You will note in the fifth paragraph of this document it states that: "Despite the long term needs of the nation's various defense programs, considerations of growth and stability dictate that a conservative corporate management actively seek diversification in commercial, non-defense business."

During the negotiations to which you referred, was anything said by representatives of General Dynamics which could lead you to determine whether or not the statement there is accurate, and whether that was a reason

why General Dynamics was interested in merging with Material Service?

A Yes, sir, it is.

Q I note in the second paragraph it states as follows: "The directors expect to achieve this diversification through development of commercial products stemming from present programs such as"—and I would like to take these seriatim.

Number one, the Corporation's Convair 880/600 jet transports.

[1843] What has happened to that program, if you know?

A Both have been discontinued.

[1844] Q It also says, second, Canadair's commercial turbo-prop CL-44 and CL-540 aircraft.

What has happened to these programs?

MR. CUSACK: Your Honor, the Government objects to this line of questioning as being wholly immaterial and irrelevant to the issue of this lawsuit.

This lawsuit concerns the merger of United Electric and the Material Service-General Dynamics, and elimination of competition between Freeman and United Electric.

THE COURT: Do you have any comment?

MR. HEDLUND: Your Honor, there is a raft of evidence offered with respect to General Dynamics by the Government in this case, and I think that this is clearly related to that.

THE COURT: He may answer, subject to the objection.

BY MR. HEDLUND:

Q My question was with respect to the turbo-prop CL-44 and CL-540 aircraft.

BY THE WITNESS:

A The CL-44 was a spring tail turbo-prop freighter, no longer being produced.

I don't recall what happened to the CL-540, but we are no longer making it.

[1845] Q It next refers to General Atomic's nuclear research, maritime and power reactors.

What has become of that program?

A That was a high temperature gas reactor, primarily, and that was sold to Gulf Oil.

Q It next mentions Liquid Carbonics industrial gases.

What has become of that?

A General Dynamics was ordered by the Government to divest itself of Liquid Carbonics.

Q It next refers to Stromberg-Carlson's telephone and high fidelity sound equipment.

What has happened to that, if you know?

A Stromberg-Carlson's telephone business is still quite active. The high fidelity and sound equipment has been discontinued.

MR. CUSACK: Your Honor, I hate to be picayunish, but the Government did not order General Dynamics to divest itself of Liquid Carbonics. It was ordered by the District Court.

I think counsel should stipulate to that.

THE COURT: Was it in an action filed by the Government?

MR. CUSACK: Yes, your Honor, it was. But it is an [1846] order of the Court, not by the Government.

THE COURT: All right, the record may so show.

BY MR. HEDLUND:

Q Mr. Nugent, there is in evidence the fact that at a Board meeting of General Dynamics of May 25, 1961, the following:

> The Chairman stated that the corporation—which is General Dynamics—owned common stock of certain companies as follows: United Electric Coal Company, 250,131 shares; Truax-Traer Coal Company, 32,300 shares; American-Marietta Company, 8,795 shares; and United Utilities Incorporated, 158,400 shares.
>
> He outlined the reasons why it might be advisable to sell part or all of the stock of such companies,

and recommended that authority be granted to take such action.

After discussion, upon duly made, seconded, and unanimously carried motion, it was resolved that the proper officers of the Corporation, with the approval of the Chairman of the Board and Counsel for the Corporation be, and hereby are authorized at such time as they deem it advisable to sell and to take any and all action which may [1847] be necessary in connection with the sale, or part of all of the common stocks of which I have just listed.

Mr. Nugent, do you know why such a subject came up at that meeting, and why such a resolution was passed?

A Well, as a result of the commercial airplane problem at that time the money situation was quite tight, and they were looking for places to acquire some money.

[1848] Q In point of fact, did General Dynamics ever sell any of that 250,103 shares of United Electric?

A Henry Crown was strongly opposed to it and the stock was not sold.

Q Why was he opposed to it, if you know?

A Because he intended to eventually merge United Electric into the Freman Coal Corporation.

Q Would you have been opposed to such a sale?

A Yes, sir?

Q Mr. Nugent, I show you what has been received in evidence as Defendants' Exhibit 9, which is a letter from you, as President of Freeman Coal Mining Corporation, to Mr. Frank F. Kolbe, President of the United Electric Coal Companies, dated February 5, 1959.

My first question is, you were not at that time on the Board of United Electric, were you?

A I think not.

Q My next question is, it refers in the first sentence, "We have your proposed plan for Buffalo Creek."

Was that proposed plan a strip or deep mining?

A It was a plan to go underground, drifting in off the high wall.

MR. HEDLUND: Your Honor, I will be moving into a new area now.

[1849] THE COURT: We will go for another 15 minutes, to make up for some of the time we lost.

BY MR. HEDLUND:

Q Mr. Nugent, I hand you what has been received in evidence as Defendants' Exhibit 23, which is a three-page—I'm sorry. I stand corrected. A five-page document, the first page of which is a memorandum on the memorandum stationery of Irving Crown, bearing a date of 6/16.

Attached to that is a memorandum from JMN to Frank, dated June 11, 1964.

Attached to that is a three-page draft titled "President's letter to shareholders."

My first question is, can you identify the initials on the first memorandum on the stationery of Irving Crown?

A It is Irving Crown's writing, and it is his initials.

Q And does the "Frank" refer to you.

A Yes, sir, it does.

Q Was that memorandum actually prepared on July 16th of 1964?

A Yes, sir, it was.

Q In 1964, what responsibilities, if any, did [1850] Irving Crown have with respect to United Electric?

A He was on the Board of United Electric.

Q Could you, Mr. Nugent, please, decipher the writing, read the writing that appears on the memorandum from Irving Crown.

A "I note all comments are bullish on future. No hint that we are reaching end of line on reserve replacements? Please see."

MR. CUSACK: May the record show that there is a question mark after "replacements"?

THE COURT: I think the record speaks for itself. Is this in evidence?

MR. CUSACK: Yes, you Honor, it is. But I thought perhaps for the purpose of the transcript—

THE COURT: Well, all right.

Proceed.

BY MR. HEDLUND:

Q Mr. Nugent, what is dust?

A Dust is fine coal that is removed from, let's say, a one and a half inch by Zero coal generally for customers that are prepared to pay a premium price for coal from which dust is removed.

Q What is the practice in the past to dispose or otherwise throw away the dust that was so removed [1851] from the coal that you have described?

A There were times when, in the initial stages, that the dust just wasn't marketable. It presents a handling problem. And in the early stages we threw it on the gob pile. Later we found a market for it. It was sold at a price under the cost of production. However, the combined realization from the dust and the double screen size or premium product was profitable.

[1852] Q Then is it true that in the sale of dust by Freeman, if you will, that you do not actually lose money by such a sale?

A Yes, sir.

Q And when you say that it is sold below the cost of production, this is an unallocated cost of production, is it not, among all of the coal, oil—

A Sold below the minimum run cost of production.

Q Is there any incremental cost in selling dust or producing dust for sale above and beyond the production costs for the coal of the sizes from which dust has been removed?

A I'm not sure that I understand that question.

MR. HEDLUND: Read the question.

THE COURT: Read him the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A If you mean do we incur an additional cost because we do produce this, yes, we do.

BY MR. HEDLUND:

Q And you are able to recover that additional cost, are you not?

A Yes, sir. Yes, sir, we are.

Q You spoke of the difficulties of handling dust. [1853] Could you tell me what those are, please?

A It is difficult to retain it in the car. It is subject to blowage. In the early stages we found when we put a car of dust behind the box car, when it reached destination you had a half a car of dust. Those were some of the things we had to overcome, too. It tends to rat hole when it is put in a bin in a boiler room.

Q Could you explain what you mean by "tends to rat hole"?

A Rat hole. The dust is retained on the sides of the bin, and dust flows down through the center.

We later learned by putting vibrators on these bins we could unload it.

MR. HEDLUND: I would like to hand to the Reporter to mark as a defendants' exhibit—if I may, could I go off the record?

THE COURT: You may.

(There was a discussion off the record, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Would you mark that as Defendants' Exhibit No. 229, and having done so, would you hand it to the witness, please?

MR. CUSACK: Just a minute. May we have a copy?

[1854] MR. HEDLUND: Yes.

(The document was marked as Defendants' Exhibit No. 229, for identification.)

[1855] BY MR. HEDLUND:

Q I ask you, Mr. Nugent, is the information set forth on this document with respect to the estimated deep tonnage dedicated to existing mines of Freeman and other coal reserves of Freeman true and accurate to the best of your knowledge and belief?

A Yes, sir, I think so.

Q This totals, does it not, something in the neighborhood of 483 or 484 million tons of coal.

A Well, I haven't added them, but I would accept that.

Q Could you give me an estimate of approximately what percent of these reserves have a sulphur content of less than 2.5 percent?

A The coals produced by Orient No. 3, Orient No. 6 and Orient No. 4.

Q Are in the category of sulphur content less than 2.5 percent?

A 2.5, I thought you said.

Q Yes, 2.5.

A That is right.

Q Would that then mean that all of the reserves assigned here to Orient No. 3, 4 and 6, all or substantially all would be in that sulphur category?

[1856] A Would you state that again, please.

THE COURT: Read the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A Yes, Orient No. 3, 4 and 6.

BY MR. HEDLUND:

Q Your answer is yes, they would be?

A Yes, sir.

Q Would you be able to give me an estimate as to what percent of the reserves shown on the second page under the title "Other Coal Reserves" are in a sulphur content category of 2.5 percent or less?

A All of the Jefferson County reserves may not be below 2.5 percent. The northern part of our acreage could well run a little bit above that.

Now, all of the reserves assigned or that may be assigned to No. 3 and to No. 6 will run in the neighborhood of 1.5 percent in sulphur.

The reserves on the first page assigned to 3 and 6 are somewhat flexible in that we could use additional reserves not now assigned at some future date if it appears to be economical.

Q I see that the totals for Jefferson and William Counties—those are the counties for Orient No. 3, 4, [1857] 5 and 6, are they not?

A Yes, sir.

Q I see these total—

A I can't say that all of the reserves unassigned in Williamson County will run below 2.5 percent in sulphur.

Q Could you give me some estimate as to roughly what percentage it would be?

A It would be a guess. I would say half.

Q What about Jefferson County?

A Jefferson County, again, that is not clearly defined in that the reserves that will be assigned to Mine No. 7 may not all run below 2.5 percent.

Mine No. 7 is the mine that is planned for future date.

Q Of the 97 million tons in Jefferson County, would half of these reserves be less than 2.5 percent sulphur or would it be more than half?

A Probably less than half.

[1858] Q There is an advertisement in evidence, Mr. Nugent, referring to, I believe, the plans of Freeman to open up Orient No. 7, Orient No. 8, and a new mine in central Illinois. What is the status of those plans, if any?

A We have abandoned the idea of opening No. 8. We had put a manned shaft, a new manned shaft at the Orient No. 3 mine. We will assign more acreage to Orient No. 3.

We have room now in reserves only for one more mine in Jefferson County. That would be No. 7.

Q Would you be able to estimate when Orient Mine No. 7 will be open?

A Well, not at this moment. We haven't completed No. 6. As soon as we get No. 6 finished, which will be sometime the latter part of this year, we will then go to work on No. 7.

Q Can you tell me approximately what you estimate is for—well, let me ask you this first. What was the total production of Freeman in 1969?

A I would say about 8 million tons, and that is a guess now.

Q What is your estimate for the production of Freeman in 1970?

A It will increase. We cut back at No. 5 because [1859] of some roof problems that we had there. That mine was producing about 2 million tons a year. We have

cut it back to 1 million tons a year, perhaps a little more.

Orient No. 6 is now producing at the rate of about 8,000 tons a day. By the end of the year, we should have it up to 12,000 or 13,000 tons a day.

Q Mr. Nugent, I show you what has been received in evidence as Defendants' Exhibit 35, which is a copy of a coal contract between United Electric Coal Companies and Central Illinois Light Company, dated September 30, 1968. I direct your attention to the supplement of that contract and a portion of paragraph 3, about in the middle, where it reads as follows:

> "In the event that prior to the expiration of this contract reserves of seller in the No. 5 and 6 seams of coal in Fulton County are exhausted, seller will make shipments under this contract from present or planned mines of Freeman Coal Mining Corporation located in the central Illinois field where the company has reserves of No. 6 seam coal approximating 400 million tons."

My question is, to what does that 400 million tons refer?

A That is coal in place rather than recoverable [1860] coal.

Q What percentage of recovery—

A It is about 250 tons of coal recoverable at the outside.

Q You say 250?

A 250 at the outside.

Q Million that would be?

A 250 million tons at the outside. That could well be a little on the high side.

Q Mr. Nugent, is there a possibility that the Cuba mine will close this year?

A I think so.

Q Would you tell me why?

A Well, we are into old works there; we are running into difficulty. When our tonnage gets down to something like 300,000 tons a year, it won't be economical to continue to operate it.

Q Why does old works interfere with strip mining?

A We are digging the No. 6 seam coal. The No. 5 seam underneath it was mined many years ago.

Q Would that have been by deep mining?

A By deep mining, yes.

Q What sort of problems does that pose?

A It is an unstable area.

[1861] Q Are there any properties at the Cuba mine that you were unable to purchase?

A Yes. We had a tract of land there that for many years we thought we should acquire, known as the Murphy tract. We though it contained a million and a half tons of coal.

We couldn't understand why this man wouldn't sell, and be included in our reserves, because we were able to pay and could well afford to pay him three times the value of his farmland. We just did not acquire it. He would not permit us to drill it and we could never get an option to drill it. We have mined up to it and around it.

It now appears that there was not a million and a half tons there. We ran into some voids and some washouts.

Had we been able to acquire the Murphy tract, we could have acquired a tract beyond that known as the Phillips tract. We have given up, of course, and moved away and their equipment is gone.

We never will know why Mr. Murphy wouldn't take three times the value for his land, but it belonged to Mr. Murphy.

Q In terms of your mining operation at Cuba, [1862] would it be feasible to move the equipment back, to try to come back to pick up this acreage if Mr. Murphy ever changes his mind?

A No, sir. We have burned our bridges behind us.

Q Do you recall approximately what the estimated tonnage was in the Phillips' tract that you were also unsuccessful in acquiring?

A Well, not offhand. It wasn't as great, of course, but it was a worthwhile piece of land.

THE COURT: Would now be a good time to break?

MR. HEDLUND: Yes, your Honor.

THE COURT: All right. We will recess until 10:00 o'clock tomorrow morning. Unless something unexpected comes up, we should get started by 10:15 or 10:30 at the latest and go all day.

Thank you.

(The hearing in the above-entitled cause was recessed to 10:00 a.m., Thursday, April 16, 1970.)

[1863]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,
Thursday, April 16, 1970,
10:30 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for Plainitff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. JAMES M. FOLSOM

[1864] THE CLERK: Case on trial.

THE COURT: Good morning.

Are there any matters to take up with the Court before proceeding?

MR. CUSACK: Good morning, your Honor.

With the kind concurrence of Mr. Hedlund, we would like to take a witness out of order. He is Mr. Hopper of the Ayshire Collieries.

THE COURT: All right, have the witness take the stand.

(Witness duly sworn.)

HOLLIE HOPPER,

called as a witness by and on behalf of the Government, was examined and testified in rebuttal as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.

A Hollie Hopper.

Q What is your home address, please?

A 620 Lawndale Drive, Plainfield, Indiana.

Q By whom are you employed, sir?

A Ayrshire Coal Company, Division of American Metal Climax.

Q What is your position at Ayshire?

[1865] A Vice president of operations.

Q How long have you held that position?

A Since 1967.

Q What position did you hold prior to that time?

A General Superintendent of the Mining Operations.

Q How long did you hold that position, approximately?

A Nine years.

Q In reference to your Sun Spot Mine, Mr. Hopper, has the Sun Spot Mine of Ayshire been profitable in the past?

A Yes. We consider Sun Spot a profitable operation. It has had periods in which it was less profitable than other periods.

Q In 1969 where did the Sun Spot Mine rank among the Ayshire mines in profitability?

A Either in fourth or fifth position.

Q How many mines did you operate in 1969?
A Ten operations.
[1866] Q Is the Sun Spot Mine profitable now?
A Yes, it is.
Q What do you expect to be the profitability of Sun Spot in the future?
A We would expect it to be a profitable operation.
Q Sir, what is the overburden ratio of the remaining coal reserves of Ayrshire at Sun Spot?
A The average overburden ratio is approximately 30 plus, between 30 and 31.
Q To one?
A To one, yes.
Q What do you expect to be the remaining life of the Sun Spot Mine?
A Some 14 to 15 years.
Q Is that with the present equipment?
A With the present equipment.
Q Sir, based on your knowledge and experience in the mining business, has stripping ratios in strip mines been increasing over the past 25 years?
A Yes, they definitely have.
Q Could you tell us, sir, when were the Sun Spot Mines—excuse me. Let me rephrase that question.
When were the Sun Spot coal reserves acquired by Ayrshire?
[1867] A In the late 1950's.
Q Is Ayrshire at the present time prospecting for strip coal reserves in Illinois, Indiana and west Kentucky, for the possible opening of a new mine?
A Yes.
Q Has Ayrshire acquired strip coal reserves in Illinois, Indiana, and west Kentucky since 1960 for new strip mines?
MR. KEMPF: We are going to object unless he breaks this down, as we have in the past, according to states.
MR. CUSACK: I don't understand. What states?
THE COURT: According to states.
MR. KEMPF: Yes.

BY MR. CUSACK:

Q Has Ayrshire acquired strip coal reserves in Illinois since 1960, for the possible development of a new strip mine?

A Yes, sir.

Q Has Ayrshire acquired strip coal reserves in Indiana since 1960 for the possible development of a new strip mine?

A Yes, sir.

[1868] Q Has Ayshire acquired strip coal reserves in west Kentucky since 1960 for the possible development of a new strip mine?

A No, sir.

Q Mr. Hopper, do you know of any other coal producers who have acquired since 1960 any strip coal reserves in Illinois for the development of a new strip mine?

A Yes.

Q Since 1960, has Ayshire acquired new deep coal reserves in Illinois for the development of future underground mining?

A I beg your pardon. Since what date?

Q Since 1960, has Ayshire acquired new deep coal reserves in Illinois for the development of future underground mining?

A Yes.

Q Since 1960, has Ayshire acquired new deep coal reserves in Indiana for the development of future underground mining?

A We have some deep reserves under option acquired since 1960.

Q Would these reserves be for the possible development of a future underground mine?

[1869] A Yes, it is a possibility.

Q The deep coal reserves which Ayshire has acquired since 1960 in Illinois, would this be for the possible future development of an underground mine in Illinois?

A Yes, it is a possibility.

Q Could you tell us, sir, how Ayshire got into the deep or underground mining business?

A Well, early in the 1950's, Ayshire acquired two underground operations, small operations: one in central Indiana and one in the southern Illinois area.

Q In regard to the mine in central Indiana, could you tell us the approximate tonnage of that mine?

A Approximately 400,000 a year.

Q Could you tell us the approximate tonnage of the mine acquired in southern Illinois?

A About 250,000.

Q Following this, sir, did Ayshire itself open up a new deep mine?

A Yes. In 1959, Ayshire opened what is known as the Thunderbird Mine.

Q Where is that located, sir?

A Well, it is located at Shelburne, Indiana, [1870] which is six or eight miles north of Sullivan, Indiana.

Q Is this a profitable mine, sir?

A No, it is not.

Q Could you tell us the reason?

A Well, number one, it has very poor roofing conditions which provides us with an exorbitant cost in that respect. Secondly, probably Ayrshire negotiated a rather poor contract realization-wise. Frankly, the price of the coal was just much too cheap.

Q In your opinion, sir, do you feel that a coal company with greater experience in deep mining than Ayshire could have done any better with Thunderbird?

A Well, knowing the physical conditions that we have encountered there, I rather doubt that anyone could have made a profitable operation out of it.

Q Where did Ayshire obtain the personnel to staff the Thunderbird Mine?

A Well, having acquired these two underground operations, small underground operations in the early fifties, the personnel from those operations provided a nucleus to build an organization at the Thunderbird Mine.

[1871] Q Does Ayrshire plan to open up any new deep mines in Illinois?

A We have no definite plans. However, we have feasibility studies underway that will determine the final outcome.

Q Does Ayrshire plan to open up any new mines in Indiana?

A Not at the present.

Q Does Ayrshire own a deep coal reserve deposit known as the Denmark Deep?

A Yes, we do.

MR. CUSACK: I think it might be helpful if we could locate it on the map.

THE COURT: You may.

BY MR. CUSACK:

Q Mr. Hopper, directing your attention to what has been received in evidence as GX Nugent Deposition Exhibit 38, a map entitled "Shipping Coal Mines in Illinois," can you tell us approximately where the Denmark Deep reserves are located?

A Well, it is down there—

THE COURT: You can step down and point to it, Mr. Hopper.

MR. KEMPF: Mr. Cusack, I don't mean to interrupt [1872] your interrogation, but, as you know, I was planning to provide the Court with a copy of that map. If you would like, I will do so now.

THE COURT: Oh, it is not necessary. I have seen that pointed to. I think I know a little bit about the State of Illinois, too.

All right, you may proceed.

BY MR. CUSACK:

Q Mr. Hopper, could you just tell us generally where the reserves are located.

A It is northwest of DuQuoin, almost north of Pinckneyville, somewhere in this general area right in here.

Q Is it fair to say that the Denmark Deep reserves are located several miles north of Pinckneyville, Illinois?

A Yes, a few miles north of Pinckneyville.

Q Mr. Hopper, do you anticipate that the Denmark Deep Mine will be mined in the future?

A Yes. I feel that the Denmark reserves will be mined in the future. Just how much in the future, I can't say. I believe it largely depends on, oh, the new environ-

mental legislation that is being passed.

Q Could you give us any time approximately in which you feel this mine might be opened?

[1873] MR. KEMPF: Your Honor, I object. The witness said he could not predict how far in the future it would be opened. To ask him for a specific time in light of that—

THE COURT: Well, if he can give an approximate date, he may.

BY MR. CUSACK:

Q If you can, give an approximate date.

A I really have nothing to go on at this time. We would hope to open it within a few years, but I can't see it at this point.

Q Is the Denmark Deep reserves, sir, fairly well situated?

A Yes, they are reasonably will situated, No. 1, because they are reasonably close to what we have as a strip reserve some 15 miles from there. We are expecting to create a market with our strip reserves which might carry over into the deep reserve area.

However, there are some new developments that are presenting possible problems of transportation in view of the possible dredging of the Kaskaskia River which may put other people in a better position than us.

Q I forgot to ask you one question, sir, in [1874] regard to stripping, and it is my last question.

Mr. Hopper, do you know of any other coal producers who have acquired strip coal reserves in Illinois for the development of a mine since 1960?

A I beg your pardon. Would you repeat that?

Q Do you know of any other coal producers or coal operators who have acquired any new strip coal reserves in Illinois since 1960 for the development of a new mine?

A Yes, I do.

[1875] MR. CUSACK: That is all, your Honor. Thank you, sir.

THE COURT: You may cross examine.

MR. HEDLUND: May we have just a moment?
THE COURT: All right.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. HEDLUND: Your Honor, could we have a brief recess?
THE COURT: I will be recessing again at 11:30.
MR. HEDLUND: Then if we could have just a couple more minutes.
THE COURT: You may. Let us proceed.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

MR. CUSACK: Your Honor, I beg leave of Court. Mr. Futterman reminds me I have to ask one slight question, and I would appreciate—
THE COURT: Any objection?
MR. KEMPF: No objection.

BY MR. CUSACK:

Q Mr. Hopper, prior to Ayshire's acquisition [1876] of the two deep mines which you have testified about, was Ayshire solely in the strip mining business prior to that time?
A Yes.
MR. CUSACK: Thank you, sir. Thank you, your Honor.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

THE COURT: Cross examination.

CROSS EXAMINATION

BY MR. KEMPF:

Q Mr. Hopper, isn't it true that during fiscal year 1967 Ayrshire's Sun Spot Mine had a rate of return on investment of roughly between 4 and 5 percent?

A Roughly so, yes.

Q Isn't it true that during fiscal 1968 Sun Spot was a marginal operation, and that during the latter portion of that fiscal year when the mine was operating at overburden ratios of from 33- to 36-to-1 the mine was not operating profitably?

A This is true.

Q Isn't it true, Mr. Hopper, that largely as a result of the operations at the Sun Spot Mine during [1877] fiscal 1968 and in particular in view of the difficulties encountered with spoil stability at the higher ratios mined during that year, Ayshire has redefined its reserves at the Sun Spot Mine?

A Yes, we have.

[1878] Q And is it not true that Ayrshire has changed the limit of the depth at which it will strip at the Sun Spot Mine from the former limit of 80 feet to a present limit of 700 feet?

A That is correct.

Q And isn't it true that Ayrshire has made the decision that in the future it will not mine on a continuing basis at the Sun Spot at overburden ratios exceeding 30 to 1?

A On a long-term average, yes, we do not expect to exceed approximately 30 to 1.

Q Isn't it true that the current profitability of the Sun Spot and the profitability during fiscal 1969 is largely due to the fact that the overburden ratio at which the mine has operated during these periods is around 25 to 1 or 26 to 1 and the fact that no blasting is required in the overburden removal operation?

A This is largely contributing to the profitability.

Q You testified concerning the Thunderbird Mine during the course of your direct examination by Mr. Cusack. You testified that prior to opening the Thunderbird Mine Ayrshire had acquired two companies which did conduct underground mining operations—

MR. CUSACK: Objection, your Honor. The testimony [1879] was that it had acquired two mines.

MR. KEMPF: My question would clear this up.

BY MR. KEMPF:

Q Did you acquire two companies known as the Little Betty Coal Company and the Carmac Coal Mining Corporation?

A Yes.

Q And they operated the Little Betty and the Carmac Mines?

A Yes.

Q You indicated that even someone with more experience and expertise, in your view, probably would not have operated the Thunderbird Mine successively. My question is: Isn't it quite possible that someone who did have a greater amount of experience and expertise in deep mining at that time would not even have opened the Thunderbird Mine?

A Well, this is entirely possible. This is a case of judgment.

Q You indicated that the mine was not profitable. Isn't it a fact that within two years after the opening of the mine it was so clear that mine was not going to be profitable over its life that Ayrshire at that time wrote off $5 million of its investment in the [1880] Thunderbird Mine?

A This is true.

Q And I gather that since that time operating losses have continued?

A Operating losses have continued at that operation for every year of its life except, I believe, for two fiscal years.

Q And that was opened in 1959, you testified?

A Yes, sir, it was.

Q So that in the 11 years, nine of those 11 years the mine has lost money on a operating basis?

A Yes.

[1881] Q In your judgment, Mr. Hopper, if Ayshire had it to do over again, do you think it would be likely that they would open the Thunderbird Mine, in view of what they now know?

A In view of what they now know, absolutely not.

Q Mr. Cusack questioned you about Ayshire's exploration activities in Illinois, Indiana and west Ken-

tucky. I would like to ask a few questions along the same line.

Did Ayshire investigate the possibility of strip reserves in Menard County around Petersburg?

A Petersburg, Illinois?

Q Yes.

A Yes.

Q After exploring for reserves in Menard County, Ayshire decided not to take any options in that area, isn't that true, Mr. Hopper?

A This is true.

Q One of the reasons leading Ayshire not to take options in Menard County was the fact that Ayshire questioned the strippability of those reserves that were located there in view of the depth of the coal and the unconsolidated nature of the overburden, isn't that true?

[1882] A This is true.

Q In view of the fact that in addition to United Electric, Ayshire also investigated and turned down coal reserves in the Menard County, wouldn't you agree that it would be improper to regard United Electric's failure to acquire the reserves located there as an indication that the company was not making serious efforts to increase its strip reserves?

MR. CUSACK: I object. It calls for speculation on the part of the witness.

MR. KEMPF: I think this witness is qualified to answer that, your Honor. Mr. Cusack called him to testify to these matters.

MR. CUSACK: It is pure speculation, your Honor.

THE COURT: The objection is sustained.

BY MR. KEMPF:

Q Let me look at it a different way. I think this will overcome that objection.

Wouldn't you agree, Mr. Hopper, that the fact that a coal company had devoted time and money to the investigation of the field such as that located in Menard County, that that is at least one indication that the company is making serious efforts to enlarge its strip reserve holdings?

[1883] MR. CUSACK: Same objection, your Honor.
THE COURT: The objection is overruled.

BY THE WITNESS:

A Yes. I think it would indicate that the company was attempting to acquire reserves. This is true of all coal companies. They continually carry on an exploration program, so far as I know.

BY MR. KEMPF:

Q I would like now to ask you about another area of reserves in the state of Illinois.

Ayshire investigated, did it not, the coal reserves controlled by one Kenneth Youngs, southeast of the town of Mount Vernon, near the Belle Rive area, is that not true, Mr. Hopper?

A Yes, sir.

Q At the time of its initial investigation, Ayshire concluded, did it not, that largely on the basis of the analysis of the characteristics of the coal, that the field was not economically strippable?

A Well, I would rather say that it was not—I wouldn't agree that it was not economically strippable. It might not be an economical operation because we could not correlate the analysis of the coals to come up to those analyses as representative of the [1884] field. We had failed in our procedures in some manner, which we later did reconcile and find what our problem was.

Q Isn't it your view that the reason for that was that the information supplied to you at the time of your initial investigation by Mr. Youngs was not sufficient in detail to enable an accurate appraisal of the coal's characteristics?

A Well, he had very detailed information and a great deal of information. Probably the greatest problem that we encountered in our failure to recognize and support his analysis was that we did not recognize the procedures or the manner in which he had obtained his cores and channel samples for analysis, and this basically was our problem in not being able to correlate analyses.

[1885] Q And as a result of that problem, you initially dropped your interest in that field, is that correct?

A We did.

Q You know also, do you not, Mr. Hopper, that both Peabody Coal Mining Corporation and Stonefort Coal Mining Corporation also investigated that field and also dropped interest in that field?

A I have heard that—I understood that Peabody Coal Company had investigated it and turned it down. I don't believe I was aware that Stonefort had.

MR. CUSACK: I move to strike on the ground of hearsay, your Honor, the last answer.

MR. KEMPF: He has indicated he understood this had happened, and he said he had not heard of the other. Why don't we have the answer read back?

THE COURT: I heard the answer. It may stand. Proceed.

BY MR. KEMPF:

Q I will now ask you a question similar to my question about Menard County. Wouldn't you agree, Mr. Hopper, that the very fact that United Electric had devoted its time and money to the investigation of the coal reserves in this area is at least one indication that that company was making serious efforts to enlarge its strip reserve holdings?

[1886] MR. CUSACK: I object, your Honor, on the ground that it calls for speculation by the witness.

THE COURT: The objection is overruled. You may have a standing objection to any similar question.

MR. CUSACK: Thank you, your Honor.

BY MR. KEMPF:

Q You may answer, sir.

A I think it is a clear indication that they were attempting to find and presumably acquire additional reserves.

Q Mr. Cusack discussed with you the so-called Denmark Deep acreage. Isn't it a fact, Mr. Hopper, that the likely cost of recovery of the Denmark Deep and the nearby Round Prairie Field would be greater than that of the strip reserves in Belleville against which this coal would have to compete, such as specifically Ayrshire's own Denmark strip acreage?

A Well, I can only answer for that portion that relates to our Denmark Deep, not the Round Prairie, because I know nothing about it. But, yes, we will produce coal more cheaply in our strip Denmark field than in the deep Denmark area.

[1887] MR. CUSACK: Will counsel stipulate that the situation at Denmark is the same as at Round Prairie, as indicated by his question?

MR. KEMPF: I will indicate to Mr. Hopper—

I will not stipulate because I am, obviously, like the witness, he is not familiar with our property and we are not familiar with his.

I will indicate, however, that the coal is very close to the field that United Electric owns known as the Round Prairie Field.

BY MR. FEMPF:

Q Is that not true, Mr. Hopper?

A Yes, I am sure that is correct.

Q Isn't it a fact, Mr. Hopper, that in attempting to sell the coal from the Denmark Deep area competitively, it would be at a competitive disadvantage from a transportation viewpoint in comparison to other deep reserves held in the Belleville area such as Peabody's undeveloped reserves along the Kaskaskia River?

A If and when the Kaskaskia is canalized, they will be in a better position freight-wise to offer coals to the market.

Q Isn't it a fact that the higher sulphur content of the Denmark Deep acreage might be another factor further delaying the development of those reserves?

[1888] A Yes. I believe I stated earlier that I thought that, due to the new environmental legislation that is being passed, that it place these reserves in a doubtful position for their mineability in the very near future.

Q Mr. Cusack asked you about the Denmark strip acreage. How long did Ayshire control the Denmark strip acreage before the decision was made to open a mine there?

A Well, we have held the Denmark strip acreage since either the year 1926 or 1927.

Q So, that is over 40 years?
A Yes, that is true. We acquired it at a tax sale.
Q Mr. Cusack also referred to the fact that since 1960, mines haven't been opened on new strip reserves.
MR. CUSACK: I did not refer to that, your honor. That is not the question I asked.
THE COURT: Would you read the question.
[1889] THE REPORTER: "Q Mr. Cusack also referred to the fact that since 1960, mines haven't been opened on new strip reserves."
MR. KEMPF: "Have" is the word I said, not "haven't."
MR. CUSACK: I did not ask that question, your Honor.
My question was "Do you know of any other coal producer which have acquired new strip coal reserves for the possible development of a new mine in Illinois since 1960?"
MR. KEMPF: I stand corrected.
THE COURT: All right Revise your question.
MR. KEMPF: Yes, your honor.

BY MR. KEMPF:

Q Isn't it a fact, Mr. Hopper, that coal reserves presently available for acquisition or coal reserves acquired in recent years are bought with the expectation by the company acquiring the reserves that they will be mined in the long run rather than the short run, and that many of these reserves may not be developed for 30, 40, 50 or more years?
MR. CUSACK: I object, your Honor. I think you better lay a foundation that he has information on that.
THE COURT: Well, if the witness knows, he may answer.
MR. KEMPF: I think this one clearly follows up [1890] Mr. Cusack's question.
THE COURT: I have ruled. I said that if the witness knows, he may answer.

BY MR. KEMPF:

Q Would you like the question back, again?
A I am not quite sure I understand the question.

THE COURT: Would you read the question, please.

Q (Read by the Reporter.)

BY THE WITNESS:

A Well, if I may, I believe there are two questions to be answered there. At least I see it as a two-part question.

THE COURT: You are quite right.

BY THE WITNESS:

A No. 1—

THE COURT: Reform your question. There was no objection on that ground. I thought maybe the witness could answer it.

MR. KEMPF: Well, if the witness understands both questions, he may answer them, or I will—

THE COURT: Do you understand both questions?

THE WITNESS: Yes, sir.

THE COURT: All right.

[1891] BY THE WITNESS:

A Well, number one, yes, reserves that may be acquired here in the next few years, or reserves that have been acquired in the most recent past, it is entirely possible that a great portion of them will not be mined for a number of years.

When you say 30 or 40 years, I probably could not agree with the 30 or 40 years. I will have to say somewhere in the future.

Now, the other part of the question that I believe I understood, some of the reserves that have been acquired and may be acquired in the future, I can foresee that they could be developed immediately.

BY MR. KEMPF:

Q Just as Ayrshire developed its Sun Spot reserves shortly after their acquisition?

A Yes, because primarily, now, you are talking about —you are putting reserves in one category. There are two kinds of reserves: deep and strip.

Q To follow that, just as the Banner Mine of United Electric was opened up shortly following the acquisition of those reserves?

A Yes.

Q You raised the fact that these are both strip and deep [1892] reserves. I would like to address myself to that for a moment.

Isn't it a fact, Mr. Hopper, that it is common knowledge within the coal industry that strip reserves available for acquisition are in extremely short supply, and that if there were known economically recoverable reserves, there would be an eager scramble to acquire them?

A Yes, this is true.

Q Mr. Hopper, are you familiar with the mining engineering firm known as Paul Weir & Company?

A Yes.

Q Ayrshire Collieries retained the Paul Weir Company to prepare an analysis of Ayrshire's property in connection with Ayrshire's merger discussions with Ashland Oil and American Metal Climax, is that correct?

MR. CUSACK: Objection, your Honor. This is outside the scope of the direct examination. We didn't even mention Paul Weir.

THE COURT: Do you have any comment?

MR. KEMPF: Yes, I do, your Honor. This witness is being called to rebut the evidence concerning the areas that he is going into this morning, that has been introduced by the defendants. One of the important [1893] items of evidence is a report which was prepared on these subjects by the Paul Weir Company.

I am merely asking this witness whether he is familiar with this company. I have one additional question, and that is to find out his regard for this company.

MR. CUSACK. I believe it is still outside the scope. I don't see what relevance it has to the direct examination.

MR. KEMPF. It is the very evidence he seeks to rebut, your Honor.

THE COURT: All right. Let me inquire, you are putting this witness on in rebuttal, is that correct?

MR. CUSACK: Yes, your Honor.

THE COURT: To rebut evidence introduced by the defendants.

MR. KEMPF: If I might, your Honor, if Mr. Cusack will stipulate that none of Mr. Hopper's testimony in any way rebuts any of the information in this exhibit, I will be happy to withdraw my line of inquiry.

MR. CUSACK: No, you Honor, I won't.

THE COURT: All right. The objection is overruled then.

MR. KEMPF: Can I have the question re-read?

THE COURT: Read the question.

[1894] THE COURT: Can you ask the question again?

MR. KEMPF: Yes, I can.

BY MR. KEMPF:

Q Ayrshire Collieries retained Paul Weir Company to prepare an analysis of Ayrshire's properties in connection with Ayrshire's merger discussions with Ashland Oil and American Metal Climax, isn't that correct, Mr. Hopper?

A Paul Weir Company was not retained specifically to make an evaluation of Ayrshire for Ashland or Amex.

Q They were retained by you to make such an analysis?

A Correct.

Q The Paul Weir Company is one of the world's most widely known and highly regarded mining engineering companies, isn't it, Mr. Hopper?

A Yes. I believe they enjoy a very fine reputation.

Q I would like at this point to have you look again at what has been received in evidence as Nugent Deposition Exhibit 38.

MR. KEMPF: On this one, your Honor, I am going to be asking some questions that will require a detailed examination.

THE COURT: All right.

[1895] MR. KEMPF. I will provide the Court with a copy of the map.

THE COURT: All right.

MR. KEMPF: I have folded the map, your Honor, to the area which I will be referring to.

THE COURT: All right.

BY MR. KEMPF:

Q Mr. Hopper, the Sun Spot Mine is the mine identified with the number 57 on Nugent Deposition Exhibit 38, is it not?

A I am sorry, I can't see.

THE COURT: You may step down, sir, and look at it.

BY MR. KEMPF:

Q Would you step down, please.

A Yes.

MR. CUSACK: May I join you?

THE COURT: You certainly may.

MR. KEMPF: I will only be having a few questions, your Honor, if the witness may stay here.

THE COURT: He may.

BY MR. KEMPF:

Q The Sun Spot Mine is close to the Chicago, Burlington & Quincy Railroad, is it not?

A Yes, sir.

[1896] Q The town of Industry is not near a railroad, is that correct?

MR. CUSACK: Objection, your Honor, as being beyond the scope of the direct examination. The Government didn't ask anything regarding the Industry Field of this witness.

MR. KEMPF: Your Honor, I can quote Mr. Cusack's representations to the Court the other day why he was being called. I think your Honor will recall that he indicated Mr. Hopper was being called because of the proximity of the one field to the other, and to draw an analogy between the mineability conditions at one, showing that the other was mineable.

MR. CUSACK: Your Honor, I asked the witness no question regarding the Industry Field or the analogy

between the mines, the Sun Spot Mine and the possible future mining of the Industry Field.

MR. KEMPF: Again, your Honor, if Mr. Cusack will stipulate that his testimony provides no insight into whether the Industry Field can be mined or not, I will be happy to withdraw from this line of inquiry.

MR. CUSACK: That can be argued. That is a matter of argument. That is not a matter of evidence.

THE COURT: Well, we had an agreement. The Court [1897] allowed you to call different ones within the scope of that. I will allow this witness to testify subject to your objection.

Q (Read by the Reporter.)

BY THE WITNESS:

A Well, it is some 12 to 15 miles from a railroad.

[1898] BY MR. KEMPF:

Q As a rule of thumb in the industry for estimating the approximate capital cost of constructing a railroad, isn't it the usual practice to base those estimations on a cost of approximately $30 per foot?

A This is the normal estimation for cost of a railroad of any considerable length.

Q I have no further questions with regard to the map, and you may resume the chair, please.

A (Witness complying.)

Q When did the Sun Spot Mine begin its operations, Mr. Hopper?

A In 1962.

Q What is the approximate annual production of the Sun Spot Mine?

A Oh, it ranges between 800,000 and 900,000 tons per year.

Q So that there have been withdrawn from that field of reserves between 7 and 8 million tons of coal at the present time, is that correct?

A Approximately so.

Q Isn't it a fact that Ayshire controls an additional 12 million tons of coal at that area directly and an additional 8 million tons of coal by location for [1899]

a total remaining reserve of approximately 20 million tons?

A This is the reserves as we presently calculate them, yes, and we are calculating them on the basis of the capability of our present equipment.

Q To the extent that there was a difference in the magnitude of the reserves at the Industry Field in comparison to the Sun Spot Field, that would be an important factor to consider in evaluating whether the Industry Field could be mined at a profit, wouldn't it?

A By Ayshire's standards of evaluation, it would be.

Q The question of whether or not blasting would be required to remove the overburden at the Industry Field would be an important consideration as to whether that field is an economically recoverable field, wouldn't it?

A Yes, it is always an important functional cost to be considered.

Q Differences in the characteristics of the coal between, say, the Sun Spot and the Industry Field, particularly in reference to sulphur content, would be an important consideration to be looked to in evaluating the economic recoverability of the Industry Field, would it not, Mr. Hopper?

[1900] A Yes. All physical characteristics of the coal and the overburden overlying the coal, they are all important and relative to the study.

Q Isn't it true, Mr. Hopper, that each field of reserves must be evaluated in its own right and with reference to the specific conditions, locations, characteristics of the coal and the like that pertain to that field in determining whether or not that field can be recovered at a profit?

A Yes, this is a very important part of it.

When you say "recovered at a profit," the other factor there is the price of coal that you can market it for.

[1901] Q In comparison particularly to the price that the coal can be sold at mines that may be nearby, for instance, that have no capital costs for the construction of a 12 to 15 mile railroad, wouldn't that be an important factor?

A Yes, it definitely would.

Q In fact, would it be your opinion that two fields could be right next to each other, one on side of the road, and the other on the other side of the road, and that each might have its own characteristics and each might have a completely different equation in determining whether it is an economically recoverable field of reserves?

A Yes. Every field of coal is an individual within its own right, and each has its own peculiarities.

MR. KEMPF: Your Honor, I am just about done, if I might confer with my colleague for a moment.

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

THE COURT: Proceed.

BY MR. KEMPF:

Q I am going to ask you two questions, Mr. Hopper, [1902] based on some assumptions. I want you to make the following assumptions:

Assume a coal company operating four mines in Illinois.

Assume that their combined annual production is approximately five to six million tons.

Assume that these are all strip mines.

And assume that the reserves of these mines will be exhausted in, say, from two to fifteen years, depending upon the mine.

Based upon those assumptions, Mr. Hopper, in your professional opinion, wouldn't it be a mistake to force that company to operate independently in the belief that strip reserves were readily available which would enable the company to remain in business in the future at its current levels of production?

A Well, it would be my opinion that they would be in a very poor position to live up to the situation that they had been placed in, because I seriously doubt if they could acquire additional reserves to that extent to maintain that sort of production over a prolonged period of time.

Q Let me ask you a second question based on the same assumptions that I just gave you and one addit- [1903] tional assumption, the additional assumption being that the company in question has no experience or expertise in deep mining.

Based on those assumptions, Mr. Hopper, in your professional opinion, wouldn't it be a mistake to force this company to operate independently in the belief that underground reserves were available which could be developed in the short run and that the company in question could, notwithstanding its lack of experience or expertise in deep mining, successfully make a grass-roots entry into deep mining?

MR. CUSACK: Your Honor, the Government objects to the form of the question. He is making an argument, using color words, assumptions not in the record. We object on that basis.

MR. KEMPF: These are all assumptions we have heard from myriad testimony.

THE COURT: He may answer, subject to the objection.

BY THE WITNESS:

A Well, I certainly believe that they would be in a very awkward position and probably would have extreme difficulty in obtaining the talent to operate underground operations if they didn't already have them within their own organization.

[1904] MR. KEMPF: I have no further questions, your Honor.

THE COURT: All right. We will take a five-minute recess.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

* * * *

[1906]

REDIRECT EXAMINATION

BY MR. CUSACK:

* * * *

Q Sir, if I suggest to you that in 1950 Paul Weir Company estimated that there was approximately 304 million tons of strip coal reserves in Illinois available for strip mining and that since 1950, 400 million tons have been strip mined in Illinois, in your opinion would the Paul Weir Company estimates tend to be conservative?

A Based on those facts, it had to be.

Q Isn't the general reputation of Paul Weir that he is conservative in regard to coal reserves?

A I have to—

MR. CUSACK: May I rephrase the question, your Honor?

THE COURT: You may.

BY MR. CUSACK:

Q Isn't the fact, sir, that Paul Weir Company has a reputation for being generally conservative in regard to the mineability of coal reserves?

A I have to confine my answer to knowing his evaluation of Ayrshire only. I am not familiar enough with his evaluations of other reserves for other companies. But in my considered judgment, in his evaluation of Ayrshire as to mineable reserves and his complete approach, it was rather conservative.

Q So, assuming that Ayrshire had not opened the [1907] Thunderbird Mine, would Ayrshire still be interested in opening a new deep mine?

A Yes, under certain conditions, I suppose that we would be. There are many problems to be solved in opening underground mines today, and if you had underground reserves that might have a particular attraction to the market, then you would be more likely to develop them. I know that in our studies of what we might expect to do with underground reserves, we are going to make a very long, hard study of them and explore the best talent we can to give us an opinion before we ultimately spend money.

[1908] Q In regard to stripping ratios, isn't it true, sir, that as stripping ratios increased in the coal mining business, the coal reserves which were once thought to

be not mineable by the strip method have become economically mineable?

A Historically speaking, this is true because of the development of bigger, better and more expensive stripping tools.

Q If the Industry Field could be mined with equipment moved from a distance of approximately 20 miles, 20 to 30 miles, which equipment was in good repair, was paid for and had fully been depreciated, would this be an important factor in making a mine which was otherwise thought to be marginal a profitable operation?

A Yes. It would be a very important factor, but you give me very little information to base a judgment on, because there are many other factors. I haven't the slightest idea of the capability of a tool you may be talking about.

Q Isn't the cost of new stripping equipment the major cost involved in the opening of a strip mine?

A A reasonably good rule of thumb is that your major stripping tool could very well represent nearly 50 percent of your capital investment.

[1909] Q Mr. Hopper, what do you expect to be the future average overburden at the Sun Spot Mine?

A The future average overburden to be stripped at the Sun Spot Mine with the present equipment we would expect to be in a ratio not greater than 30 to 1 for the average.

[1910] Q Do you expect it to be under 30 to 1 on an average?

A For short periods of time it could be, because when we speak of average overburdens of for instance 30 to 1, then during the given period of measurment there are times when you must be under 30 and times when you are necessarily over 30 to obtain your average.

Q But for the average continued life of this mine you would estimate that it would be approximately 30 to 1?

A Yes.

Q And you expect the Sun Spot Mine to be profitable for its remaining life?

A Yes. We hope for it to be.

Q And in your best estimate, do you think it will be?

A Based on present day trends, I am sure it will be.

Q Sir, did Ayrshire benefit from its experience in regard to the opening and operating of the Thunderbird Mine?

A Yes, we did benefit from this experience.

Q In regard to the question Mr. Kempf asked you in regard to the Kenneth Young property at Mt. Vernon, you do know, do you not, that this property is now being [1911] developed into a strip mine?

A Yes. I know that it is being developed.

Q If a strip mining company was controlled for over 10 years by a corporation also engaged in the deep mining business, do you think it is likely that the strip mining company would make plans to go into underground mining on its own?

A Are you specifically referring to a complete separate entity that would be controlled only by the strip operation?

Q No. I am talking about a strip mining company which is controlled, its ownership, its stock control, is in the hands of another corporation, which is also in the deep mining business in the same area—based on that assumption, do you think that it is likely that the strip mining company would make plans to go into underground mining on its own?

MR. KEMPF: Your Honor, I am not sure I understand the question as it has been modified. Could you restate it, or could we have it read?

THE COURT: Read the question.

Q (Read by the Reporter.)

MR. KEMPF: You refer to "also in the deep mining business", which I do not think your question intended. [1912] I am not sure.

THE COURT: Are you objecting?

MR. KEMPF: Yes. I don't understand the question. At first I thought he had indicated that one was not in the deep mining business. This latter question indicates that the other company is also in the deep mining business, and I am not sure what Mr. Cusack means.

MR. CUSACK: I will rephrase my question.

THE COURT: Rephrase your question.

BY MR. CUSACK:

Q Assuming, Mr. Hopper, a strip mining corporation, which is controlled by a corporation engaged in the deep mining business in the same state—do you think it likely that the strip mining company would make plans to go into underground mining on its own?

A Well, I suppose this would depend largely on corporate set-up, but just in answer to your question, I would certainly think that the strip mining company as such would not go into the underground mining, but the company controlling, since they had underground talent, that they would develop the underground operation rather than the strip portion of it.

[1913] MR. CUSACK: May I have a consultation with my colleagues just for one moment?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. CUSACK:

Q Mr. Hopper, do you believe that in the future your company will consider acquiring strip coal reserves in Schuyler or McDonough Counties, Illinois? I direct your attention, sir, to—

A That is the area west of our Sun Spot operation?

Q Yes, sir.

A Well, it is a possibility.

Q Would your answer be the same, sir, in regard to Ayrshire possibly acquiring strip coal reserves in Brown County, Illinois?

A Excuse me. Where is Brown County?

MR. CUSACK: Mr. Sims, if he may, your Honor, could locate Brown County for us.

THE COURT: All right.

MR. SIMS: (Indicating)

BY MR. CUSACK:

Q (Indicating.)

[1914] A Well, we, Ayrshire, are in a position not to

turn down any strip reserves that are of sufficient numbers that could justify a strip coal mine in the future. We are definitely interested in strip reserves in any sizable amounts.

Q And Ayrshire is continuing to explore for these reserves, is it not?

A We carry on an exploration program completely daily the year-round.

Q Particularly in reference to Illinois?

A In reference to this continent.

Q And you are still prospecting for strip reserves in Illinois, sir?

A Yes.

Q And in Indiana?

A Yes.

Q And in west Kentucky?

A Yes.

MR. CUSACK: Thank you very much, Mr. Hopper.

THE COURT: Is there any recross examination?

MR. KEMPF: I have one question, your Honor.

RECROSS EXAMINATION

BY MR. KEMPF:

Q Mr. Cusack asked you whether it might be possible to find some strip reserves in McDonough and Schuyler [1915] Counties sometime in the future.

My question is, do you consider it likely that Ayrshire will find a field of reserves which will support an economic mine during the course of the next five to ten years in the area of those counties, which is located on a line through Industry or west of there, and you can look at the map, if you would like, sir, to assist you in making that determination.

A We have done exploration in this general area, and we don't think there are reserves of any sizable amount in the area. We do know, of course, there are small pods of coal, but they certainly aren't large enough for any justification for a coal mine.

• • • •

[1918]

FRANK NUGENT,

called as a witness by the defendants herein, having been previously duly sworn, resumed the stand and was examined and testified further as follows:

DIRECT EXAMINATION

(resumed)

BY MR. HEDLUND:

Q Mr. Nugent, would you explain, please, the background and the function of the corporation and facility known as Rail-To-Water, Incorporated?

A It is a device that was built a good many years ago to transfer coal from railroad cars to lake vessels.

Q Is it still in operation?

A Yes, sir.

Q Who owns Rail-To-Water, Inc.?

[1919] A Its stock is owned by a large group of coal companies. Those same coal companies own some bonds on the facility.

Q Does United Electric utilize the facilities of Rail-To-Water, Inc., to any substantial degree?

A No, not directly. I believe that we have taken some coal from the Fidelity Mine and mixed it with coal from southern Illinois in a lake vessel.

Q Other than that, over the past two or three years, has United Electric placed any substantial tonnage across that facility?

A No, sir.

Q Mr. Nugent, reference has been made in the record by the Government to a possible—well, I don't know whether the word was "merger" or "affiliation," but either way, with the Sahara Coal Company.

What if any problems would be involved in such a merger?

A Well, I think some very serious problems. Sahara employees, workers that belong to the Progressive Mine Workers Union that are classified by the United Mine Workers Union as being non-union workers.

Q Why would that cause a problem?

A The contract with United Mine Workers Union [1920] provides a penalty of 80 cents a ton, or rather, a payment of 80 cents a ton to the United Mine Workers Welfare Fund for coal not mined by their members and handled by a signator of the United Mine Workers labor contract.

Q So that as I understand it, you would then be faced with a 90-cent per ton penalty because of that?

A Well, I think you would have a problem greater than that. I don't believe the United Mine Workers would be digging any coal while you have that affiliation.

Q Notwithstanding the 90 cents?

A Notwithstanding the 90 cents.

80 cents, it is, not 90 cents.

Q Mr. Nugent, I want to hand you what has been received in evidence as Defendants' Exhibit 79 which is a series of advertisements by General Dynamics and an attached schedule of where those advertisements appear or were to appear.

Are you familiar with that particular advertising program by General Dynamics?

A Yes, sir, I am.

Q There is an ad in there, is there not, that does refer, if not explicitly, but by reference, to the coal operations of United Electric?

A Yes, sir.

[1921] Q Is that the ad in which there is an apple?

A Yes, sir.

Q Could you tell me, if you know, what the purpose of this advertising series was?

A To improve the corporate image.

[1922] Q Was there any intent or desire on the basis of that advertising series to try to sell coal?

A No, sir.

MR. HEDLUND: Does the Government have a copy of its Exhibit 90, and could we give it to the Judge?

MR. CUSACK: I have one. I will be happy to hand it to his Honor.

THE COURT: I don't know what—I think I know what 90 is.

MR. CUSACK: The Common Customer chart, your Honor.

MR. HEDLUND: It is the Common Customer chart, your Honor.

THE COURT: Oh, yes. If you need it, I don't need it. I will just listen.

MR. CUSACK: I will write good notes.

THE COURT: All right.

BY MR. HEDLUND:

Q Mr. Nugent, I hand you what has been received in evidence as Government Exhibit 90 which is a chart entitled "Common Known Customers of United Electric Coal Companies and Freeman Coal Mining Corporation," showing destination points, 1967.

MR. HEDLUND: Your Honor, may I stand by the witness so that I may look onto the document?

[1923] THE COURT: You may.

You may stand, too.

MR. CUSACK: Thank you, your Honor.

BY MR. HEDLUND:

Q Mr. Nugent, directing your attention to the sales in 1967 from the Crown Mine to Caterpillar Tractor Company at its plant in Decatur and from the Cuba, Buckheart Mines to the East Peoria and Montgomery plants of Caterpillar, my question is, would those sales have been competitive or in competition with each other in that year had the two companies been independent?

A No, sir, they would not have been competitive.

Q Could you explain why?

A The coal as shipped to the Decatur plant from the Crown mine is transported by truck. It is a short haul, and service is available 7 days a week. This is a particular advantage. Of course, that could not be done from the Cuba Mine.

Q What about the shipments to East Peoria and Montgomery, could the Crown Mine have competitively reached—

A No, sir. The rate would not be competitive. The freight rate would not be competitive.

Q Directing your attention to the shipments in [1924] 1967 from the Cuba, Buckheart Mines to the Peoria facilities of Central Illinois Light Company and the tonnage shown without regard to mine but tonnage from Freeman to the Springfield plant of Central Illinois Light Company, had the two companies been independent, would those shipments have been competitive?

A Again, the coal from the Crown Mine to the Springfield plant of Central Illinois Light Company was supplied by truck. The freight rate from the Crown Mine or Springfield area to the Peoria market would not be competitive.

Q With respect to the shipments in 1967 from the Crown Mine to the Meredosia plant of Central Illinois Public Service and from the Cuba, Buckheart, Banner Mines of United Electric to the same plant of Central Illinois Public Service, had the two companies been independent, would those shipments have been in competition with each other?

MR. CUSACK: Your Honor, I have to interject an objection at this time. Mr. Morris during his direct examination and cross examination went into this most fully. I think it was at least a half a day. I think this is repetitive. I think the testimony is identical to Mr. Morris'.

[1925] On that basis, I object.

MR. HEDLUND: Well, I asked Mr. Morris these questions for 1965 and 1966.

Would the Government stipulate that if I go through with Mr. Nugent on similar questions, that his answers for 1967 would be the same?

MR. CUSACK: I believe they would be.

MR. HEDLUND: You will so stipulate?

MR. CUSACK: Yes.

THE COURT: All right. Let the record so show, then.

BY MR. HEDLUND:

Q Just to add one last item with respect to these shipments as discussed by Mr. Morris and as would have been discussed by you pursuant to the stipulation, what percent of the total production of Freeman Coal Mining Corporation is represented by dust?

A Oh, 10 to 11 percent, I would say.

[1926] Q Mr. Nugent, I hand you what has been received in evidence as Defendants' Exhibit 63 which is a chart entitled "The United Electric Coal Companies Committed and Uncommitted Reserves by Mines."

If you will look down about the middle of the page and under the mine heading "Fidelity," there is an item that reads, "Tonnage Committed to Current Negotiations, 10,700,000 Tons." Under the remarks column, it is Northern States Power, Union Electric and NIPSCO.

Has a contract been signed by Northern States Power and United Electric?

A Yes, there has been.

Q Do you know what the term of that contract is?

A It is a ten-year contract with a back-up by Freeman.

Q Do you know the approximate yearly tonnage?

A I think it is about 450,000 to 500,000 tons, in that neighborhood.

Q Has a contract been signed between United Electric and Union Electric?

A No. There is one in the draft stage.

Q Other than the committing to paper of the terms of that contract, in effect, is that contract now [1927] operable?

A Well, I think we are in agreement. It is just a question of some minor details on language.

Q Do you know what the term of that contract is?

A That was a ten-year contract, I believe.

Q Does that contract also have a back-up guarantee by Freeman?

A Yes, sir, it does.

Q Do you know approximately the tonnage?

A I think that, too, was in the neighborhood of 400,000 to 500,000 tons.

Q Could it be 350,000 tons per year?

A It could well be.

Q Has a contract been signed between United Electric and NIPSCO?

A That, too, is in the draft stage.

Q Has an agreement been reached on its essential terms?

A Yes, it has.

Q What is the duration of that contract?

A I think that is four years with an option for one more on the part of the buyer.

Q Approximately what is the annual tonnage on that contract?

[1928] A I think it is about the same.

Q Freeman Coal Mining Corporation has in the past sold coal to the American Maize Products Company, has it not?

A Yes, sir.

Q Is that in Roby, Indiana?

A Yes, sir.

Q It is in the northwest portion of the state?

A Yes, sir.

Q Are you still selling coal to American Maize Products?

A No, sir.

Q Why is that?

A The plant has gone to gas.

Q In the past, has the United Electric Coal Companies sold coal to the Sanitary District of Chicago?

A Yes, sir.

Q Are they doing so at the present time?

A No, sir.

Q Why is that?

A The plant has gone to gas.

Q Mr. Nugent, are you familiar with the Keystone Coal Buyer's Manual?

A Yes, sir.

[1929] Q Could you generally describe what the function of that manual is and who it is sent to?

A Oh, it is a reference book published by McGraw-Hill of practically all of the coal mines in the United States. It goes into some detail.

Q Does it also list the names of people who buy coal?

A Yes, sir.

Q Does it carry advertising?

A Yes, sir.

[1930] Q Are you familiar with the fact that from time to time in the Keystone Coal Buyer's Manual's descriptions of particular mines that estimates are provided of the life expectancy of a particular mine?

A Yes, sir.

Q Could you tell me what validity and what purpose such estimates have?

A Well, I think not too great. Smaller operators and most operators with limited reserves are reluctant to lay before the public the nature of their reserves. I think most of them like to use the word "indefinite."

It isn't of any great value because the utility buyers are much too sophisticated to accept that type of information.

Q Would a utility rely upon that at all?

A Not at all.

Q Would it surprise you to know that the 1963 Coal Buyer's Manual contained an estimate on the life of the Mary Moore Mine in 1963, the Mary Moore Mine of United Electric, of 10 years?

A No, it wouldn't.

Q When did that mine close?

A Oh, I guess maybe five years ago or thereabouts.

Q Would it surprise you that in the 1967 edition [1931] of the Keystone Coal Buyer's Manual, that the life expectancy of the Little Dog Mine is given as 25 years?

A No, sir, it wouldn't surprise me.

Q Did that mine close last year?

A Yes. I think it went bankrupt a year or so ago.

Q Mr. Nugent, do you recall the solicitation for bids by Union Electric Company with respect to its Labadie 3 and 4 units?

A Yes, sir.

Q Do you recall approximately when that was?

A Oh, a year or so ago, two years ago perhaps.

Q Do you recall what they were asking for in terms of duration of the contract and annual tonnage?

A 20 years, I believe, and I think the tonnage was in the neighborhood of about 3 million tons.

Q That would be a total then of 60 million tons?

A Yes, sir.

Q Was United Electric in any position to be able to bid on that contract?

A No, sir.

Q Are you familiar with the solicitation for bids by Union Electric for its Sioux Units 1 and 2?

A Yes, sir.

[1932] Q Could you tell me what they were asking for on those contracts with respect to duration of contract and tonnage involved?

A I think that was 1,500,000 tons for a 20-year period.

MR. CUSACK: Would you please fix the date—

BY THE WITNESS:

A It may have been—

THE COURT: Just one moment.

Yes?

MR. CUSACK: Excuse me. Would you please fix the date on these negotiations for purposes of the record.

[1933] MR. HEDLUND: For Sioux 1 and 2? I believe I have done that for Labadie 3 and 4.

BY MR. HEDLUND:

Q Sioux 1 and 2—when were those solicitations, if you recall?

A Well, I would have to guess, Mr. Hedlund. Probably five years ago.

MR. CUSACK: I object and move to strike on the grounds of guessing. Speculation.

THE COURT: Well, his best estimate. Let's not get technical. We will be here for another two weeks.

MR. CUSACK: Withdraw the objection, your Honor.

THE COURT: All right.

BY MR. HEDLUND:

Q I am sorry, sir, but what was the tonnage and the length of contract?

A 1.5 million tons and I think it was a 10-year contract with perhaps an option for another 10, and that for the purpose of negotiating price at the end of the 10 years.

Q Was United Electric in any position to bid on that contract?

A No, sir.

Q Mr. Nugent, we had some testimony here yester-
[1934] day with respect to the estimates on owning and operating costs of Combustion Engineering's SO_2 device; which the witness, I believe, testified that 90 cents per ton was a reasonable estimate of that cost. Would you tell me whether that would be a significant or insignificant factor in coal's ability to compete?

A Oh, yes, a very significant factor. With the development of nuclear power, that could well be enough to exclude coal.

Q Are you familiar, Mr. Nugent, with the loans made by United Electric to General Dynamics in the fall of 1966?

A Yes.

THE COURT: Will this be extensive?

MR. HEDLUND: I will not conclude with him—

THE COURT: All right. I suggest then we recess until 2:00 o'clock.

(Whereupon, at 12:25 o'clock p.m., the hearing in the above-entitled matter was recessed to 2:00 o'clock, p.m., the same day and date.)

* * * *

[1936]

AFTERNOON SESSION 2:20 P.M.

* * * *

FRANK NUGENT,

called as a witness by the defendants herein, having been previously duly sworn, resumed the stand and testified further as follows:

DIRECT EXAMINATION

(continued)

BY MR. HEDLUND:

Q Mr. Nugent, are you familiar with the loans made by United Electric in the late fall of 1966 to General Dynamics?

A Yes.

Q Do you recall whether or not those loans were repaid?

A Yes, sir, they were.

Q Do you recall the interest which those loans bore?

A I don't recall the rate, other than it was higher than we were receiving on the certificates of [1937] deposit that we had been purchasing.

Q Was the money that you had in certificates of deposit—were those redeemed and used for this loan?

A Yes, sir.

Q Mr. Nugent, following the merger of the old United Electric into the new United Electric and upon its becoming a 100 percent, or rather a wholly owned subsidiary of General Dynamics, from that point to this very day were there any capital expenditure requests sent by United Electric to New York for approval that were denied or modified in any extent?

A No, sir.

[1938] Q Were such expenditure requests in fact forwarded to New York?

A Yes, they were.

MR. HEDLUND: Does the Government have Maguire Deposition Exhibit 47?

Your Honor may still have retained a copy of this exhibit as one of those that was claimed to be privileged.

THE COURT: They are in my chambers some place.

BY MR. HEDLUND:

Q Mr. Nugent, I show you what has been received in evidence as Maguire Deposition Exhibit 47, which is a memorandum dated November 1, 1966, from Mr. A. R. Finberg to H. K. Pedersen, the subject of the memorandum being the UEC tender offer.

Have you seen this document before, Mr. Nugent?

A Yes, sir.

Q Directing your attention to the second page of this document, the last sentence of this memorandum says:

> "NB: The funds referred to in this paragraph are to come to the bank not from General Dynamics but from the United Electric Coal Companies which

will be the new name of UEC Corporation as of November 7."

[1939] Can you tell me, Mr. Nugent, if you know, why those funds were to come from United Electric rather than from General Dynamics?

A That was for stock that was purchased after the tender offer expired, and that was an obligation of the new UEC Company.

MR. CUSACK: I move to strike on the ground the witness has given a legal conclusion. He is not competent to so testify.

THE COURT: Motion denied.

[1940] BY MR. HEDLUND:

Q Mr. Nugent, I wish to recall your attention to the board of directors meeting of United Electric Coal Companies of May 12, 1961, where the minutes reflect as follows:

> "Mr. Hepburn was invited into the meeting, and he and Mr. Nugent made a report on the company's stripping reserves, using maps of Fulton County and Perry County, and showing the company's reserve areas in relation to the reserve areas of other strip companies. It has been determined that the present reserves provide tonnage for continuing and growing production for about 15 to 20 years. After discussion upon motion duly made by Mr. Nugent and duly seconded by Mr. Thorson, it was unanimously resolved that the proper officers of this company, for and on its behalf, be and they are hereby authorized and directed to begin at once an aggressive program to option for purchase and/or lease areas for test drilling in the North Canton and South Buckheart areas in Fulton County and in the area in Perry County and Jackson [1941] County immediately south of the property acquired from Union Collier Company."

My question, Mr. Nugent, is, in light of that and from the time that you came on the board of United Electric

and continuing on to the present time, has United Electric made a vigorous and strenuous effort to acquire adddditional economically mineable strip coal reserves in Illinois?

A Yes, sir.

MR. CUSACK: Your Honor, the Government objects. The witness—he read from board of directors minutes that refer to the North Canton Field, the South Buckheart Field and the area at the Fidelity Mine. I think that if he is going to predicate his question on that minute, he must confine his questioning to the statement regarding those fields.

There is nothing in that minute that indicates a vigorous search for coal reserves in the State of Illinois.

THE COURT: All right. Restrict it to that, with the right to ask any question.

[1942] BY MR. HEDLUND:

Q Were the reserve activities of United Electric confined to those areas that I just read to you from the minutes of the May 1961 meeting?

A No, sir, they were not.

Q Mr. Nugent, did you or anybody else connected with United Electric that was at the same time connected with Material Service or Freeman or General Dynamics at any time from 1959 to the present time hold United Electric back in the acquisition of additional economically mineable strip reserves in the State of Illinois?

A No, sir.

Q Are you absolutely certain of that?

A Yes, sir, I am.

Q There has been a considerable amount of evidence in the record, Mr. Nugent, relating to communications and conversations between United Electric personnel and yourself or others at Freeman regarding underground mining possibilities that had come to the attention of United Electric.

With respect to any and all of those, was it ever your intention that if those opportunities proved to be economically feasible, that the profit from those operations

would adhere to Freeman rather than to United [1943] Electric?

A No, sir.

Q In point of fact, did Freeman ever take title to as much as one ton of deep coal that had been brought to its attention by United Electric?

A No, sir.

Q Mr. Nugent, there has been some testimony with respect to a probable or possible or rumored development of a strip mine down near Mt. Vernon, Illinois. Do you know anything about that?

A Yes, sir.

Q Could you tell me, sir, what information you do have with respect to that?

A Well, the TVA, we understand, or rather I understand, has a proposal for the development of what is known as the Belle Rive acreage which is directly east of our No. 6 Mine in southern Illinois. That is tied in with a proposal to develop Alabama acreage.

The Alabama acreage is, I understand, nonunion. The Belle Rive acreage, of course, is yet to be determined.

It would be most unlikely that an entity operating in a non-union operation in Alabama would be operating a union operation in Illinois, and it would be [1944] most difficult to operate a non-union operation in Illinois in close proximity to large mines such as Orient No. 3 and Orient No. 6, owned by the Freeman Coal Mining Corporation.

[1945] Q What is your understanding as to the sulphur content of the coal with respect to the Alabama acreage?

A The Alabama acreage is extremely low in sulphur, much under 1 percent.

Q Much under 1 percent?

A Yes.

Q Do you know whether this proposal is on a both or on an either/or basis?

A They must take both.

Q Mr. Nugent, there has been a considerable amount of testimony in this case and evidence in this case, as recently as this morning, with respect to the so-called Industry Field of United Electric. I know that you have

testified on your deposition with respect to it, but I have one final question.

Since your deposition, so the evidence seems to indicate, coal prices have gone up, there have been some at least temporary shortages of coal, and we have heard other testimony with respect to nuclear energy and the availability of gas, and we have heard some testimony with respect to SO_2 devices.

Q The first question is: Have you had a recent opportunity to look at the actual operating results of the Banner Mine?

A Yes, sir.

[1946] Q You were present, were you not, in the courtroom this morning when Mr. Hopper testified?

A Yes, sir.

Q Based upon your experience of 50 years in the coal industry and your professional judgment, is the Industry Field of United Electric an economically mineable strip field?

A No, sir, it is not. There was a time in the early part of 1960 when I suggested that land be acquired at farm prices, that I felt perhaps this coal might be mined after all of the coal in the Fulton County is exhausted, and that could be some 20 years hence.

United Electric has about a million dollars invested in the Industry Field. With the further development of nuclear energy, my present thinking is that the Industry Field will probably never be mined and that the company had better take its licking now and dispose of the land, at farm prices if need be.

MR. HEDLUND: Thank you, Mr. Nugent. That is all I have, your Honor.

THE COURT: Do you want a short recess before you commence your cross examination?

MR. CUSACK: No, your Honor. I am fairly well prepared up to some of the more recent material.

* * * *

[1975] CROSS EXAMINATION

* * * *

BY MR. CUSACK:

Q Yes, sir.

A Are you asking me if that is in the 1965 report?

Q Yes, sir.

A No, it is not, in language.

Q Thank you, sir. You testified, Mr. Nugent, in regard to Freeman backing up the coal contracts entered into by United Electric, is that correct, sir?

A Yes, sir.

Q Now could you please explain to the Court, sir, if United Electric and Freeman are not in competition or are not competitors for the sale of coal, how Freeman can act as a back-up for the coal sales of United Electric?

A I think I can. I have a very strong feeling that we are in a temporary bullish market on coal, and we have made a diligent effort to put all of United Electric's remaining reserves under cover. We have contracted for nearly all of the coal that United Electric will produce for the remaining life of its mines.

Now, I feel strongly within the next few years when nuclear power comes into being—and this is further supported by Mr. Corey's testimony of a day or two ago, or yesterday I believe it was—that when that [1976] nuclear power is turned on, this market will not be as it is today, and United Electric needs to have its coal under contract, because it will be near the end of the line. In order to accomplish that, we backed it up with Freeman tonnage, and that is the only way the coal could have been sold.

Q Is it fair to say that General Dynamics is trying to sell United Electric's coal as fast as possible?

A I haven't discussed it with General Dynamics. I consider myself to be an expert on the sale of coal.

Now, it is my opinion, and I haven't needed to take it up with General Dynamics, that that is what should be done in the orderly conduct of United Electric's affairs.

Q Of the 8 million tons of coal produced by Freeman in 1969, approximately what percentage of it was sold to public utility companies?

A About 72 percent.

Q How much of the coal was sold, approximately what percentage, to steel companies for metallurgical purposes?

A 8 percent.

Q And would the remainder be sales to industrial [1977] users?

A General industrial users.

Q Approximately what percentage of the coal produced by United Electric in 1969 was sold to utilities?

A Perhaps a little higher than that.

Q About 75 percent?

A Maybe about that range.

Q Would the remainder of that coal be sold, then, to general industrial users?

A Yes, sir.

Q You testified this afternoon regarding the loans made by United Electric to General Dynamics. Do you recall that?

A Yes, sir.

Q These loans were repaid, sir, after United Electric was merged into General Dynamics, is that correct?

A Yes, sir.

[1978] MR. HEDLUND: I am going to object, your Honor, to the characterization. This has been done before, and I think the record should show. United Electric was not merged into General Dynamics. United Electric was merged into United Electric. It remains a 100 percent subsidiary.

THE COURT: Do you accept that statement for the purpose of the question?

MR. CUSACK: Yes. I submit it is a bit of a quibble.

THE COURT: All right. Let's proceed.

Are you ready to answer?

THE WITNESS: Do I have a question?

THE COURT: Yes.

MR. CUSACK: I believe he answered it.

THE COURT: Did he answer it? All right. Proceed.

BY MR. CUSACK:

Q Sir, this repayment of the $2 million loan of United Electric to General Dynamics—

A Yes, sir.

Q —was this before or after United Electric declared the $6 million dividend payable to General Dynamics?

A If you are dealing in days, I don't know. It could be a day or two after or a day before. I don't recall.

[1979] Q It was in that period, though, was it not?

A Yes. This was an ordinary banking function. It was handled by our treasurer.

Q Was it a wire transfer of funds?

A Yes. All of our funds are handled in New York on a daily basis. Our funds are transferred to New York. We draw on New York each day. This eliminates the necessity for carrying balances in hundreds of banks throughout the country. All divisions pool their funds in New York.

Q In regard to the capital appropriation requests of United Electric, isn't it true that you would have to approve of these capital appropriation requests prior to their being sent to New York?

A Yes, sir.

MR. CUSACK: Your Honor, may I borrow back Maguire Deposition Exhibit 47?

BY MR. CUSACK:

Q Mr. Nugent, I hand you Government Exhibit Maguire Deposition Exhibit 47. I ask you, sir, to examine page 2 of that exhibit, the last full paragraph. Have you finished reading it?

A Yes, sir.

Q Isn't it true that in 1966 $2,672,207 of United Electric's funds were used to pay for the General [1980] Dynamics tender offer for the shares of United Electric?

A I don't think that is true. My recollection is that United Electric after the tender offer had expired spent $1,300,000 for further acquisition of United Electric's stock.

MR. CUSACK: May I have a moment, please, your Honor?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. CUSACK:

Q You testified, sir, regarding the Belle Rive property at Mt. Vernon.

A Yes, sir.

Q This property is being developed by Merle Kelce, is that correct?

A Well, I don't know that that is entirely correct. He may have a partner.

Q On what testimony or on what evidence do you base your testimony regarding the Belle Rive property?

A On a conversation with TVA. This is not a public offer. This is a negotiated deal, and the deal has not been made public as yet. When it is concluded, [1981] it will be made public. In the meantime, there is a lot of gossip on the street, which apparently you have picked up. That acreage was first called to United Electric's attention in 1928. We went into it again in 1964. In 1964, Mr. Young, who at that time owned the property and who owns it presently, then represented that he had 5 million tons.

Now, some of the gossip on the street doesn't quite fit the facts as they were presented to us by Mr. Young. [1982] Q How many tons are in the field now, if you know?

A Present rumor is 17 million. It has grown from 5 million to 17 million, and the seam of the coal is one foot eleven inches.

Q What is the overburden?

A It is pretty high. I have forgotten.

Q Isn't it over 75 feet?

A It is over 75 feet, and the quality of the coal has not been definitely determined. The sulphur content varies from 2 percent to 5 percent. We don't know which it is.

Q Is it No. 5 or No. 6 coal?

A It is a bastard seam coal. It has no characterization.

Q In regard to the Industry Field, isn't it a fact that Mr. Hepburn of United Electric believed that the Industry Field would after the exhaustion of the Fulton County strip coal reserves be an economically profitable operation?

MR. HEDLUND: I am going to object, unless Mr. Cusack clarifies his question. Are you talking about all, everybody's Fulton County reserves, all reserves of Fulton County, or United Electric's?

MR. CUSACK: United Electric's.

[1983] THE WITNESS: May I have the question?

THE COURT: Rephrase the question.

BY MR. CUSACK:

Q Isn't it a fact, sir, that Mr. Robert Hepburn of United Electric believed that when United Electric's Fulton County coal reserves were exhausted, the Industry Field could be developed into an economically mineable strip mine?

A Well, I don't know what Mr. Hepburn believed, but whatever he believed, I would not be willing to accept his judgment. He had absolutely no knowledge in the market, nor did Mr. Kolbe. That was the problem with the Industry Field. The field was purchased by people who knew nothing about markets. They had no conception of what they were going to do with the coal after they bought it. That is why they spent a million dollars of the company's money and wasted it.

Q But you testified, had you not, that United Electric was a highly profitable company? Wouldn't that indicate it to you that its management knew something about markets?

A Not at all. Mr. Kolbe frequently had said that he knew nothing about markets, that he depended entirely upon Johnny Morris, that Johnny was a good salesman. I [1984] agreed with that in total. I don't know a better salesman than Mr. Morris. But he was not consulted when the Industry Field was acquired. Had they consulted him, the million dollars would not be down the drain.

Q Isn't it a fact that Mr. Morris—

A Let me say further that the Industry Field is nothing other than a red herring. When we moved into United Electric, I found this asset on the books, of questionable value. Let's assume the management made a mistake. We don't criticize management for the mistake. We criticize managment for trying to defend the mistake.

[1985] Q Isn't it a fact, sir, that Mr. Morris, while he was a director of United Electric, approved the acquisition of coal reserves at the Industry Field?

A I think not.

Q Isn't it a fact that while you were a director of United Electric you approved the acquisition of coal reserves at Industry Field?

A I did, at farmland prices, on the basis that it was worth no more than that.

Q If it was worth no more than that, why didn't you dispose of it?

A Why didn't we dispose of it? We can't find anybody foolish enough to buy it.

Q Have you ever tried?

A Yes. I would hate, I just wouldn't have the guts to offer the Industry Field to anybody in the coal business. It would be an insult to one's intelligence.

Let me give you an example, if I may—

THE COURT: I think you have answered the question.

MR. CUSACK: May I have five minutes, your Honor? Can we take our break now? I think I can finish up in about 10 minutes with everything.

THE COURT: All right. A five-minute recess.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

* * * *

[1987] THE COURT: Yes.

MR. HEDLUND: The witness certainly did not testify with respect to the competition between these two companies in 1955 to 1959.

MR. CUSACK: Well, would you stipulate that United Electric and Freeman were in competition from 1955 to 1959? Then we can shorten this.

MR. HEDLUND: With respect to some accounts, I think that may have been true. The Buffalo Creek Mine was operating in that time. We have already heard testimony from TVA on this.

THE COURT: Well, do you stipulate to Mr. Cusack's statement or not?

MR. HEDLUND: If he wants to reframe it, I may. Not generally, no I won't stipulate.

THE COURT: Well, then the Court will rule on the question that there has been testimony both from this witness and Mr. Morris that they were not in competition.

He may answer. You may proceed.

BY THE WITNESS:

A The question was, did I discuss prices of Freeman coal and United Electric's coal during that period of time?

BY MR. CUSACK:

Q With Mr. Morris.

[1988] A With Mr. Morris, I can't say that I went back as far as 1954, but during that period, I discussed prices of United Electric coal. The prices Freeman coal were of no concern to Mr. Morris. I was policing the United Electric Sales. Mr. Morris was not policing Freeman sales.

Q Because during this period of time you controlled United Electric?

A We had a substantial stock interest.

Q Please answer by question.

THE COURT: Read the question.

(Question read by the reporter.)

BY THE WITNESS:

A If "control" mean 51 percent of the stock, no we did not. We had four members of a 9-member board in 1959.

BY MR. CUSACK:

Q Prior to 1959, did you consider that you controlled United Electric?

A No, sir.

* * * *

[1994] BY MR. CUSACK:

Q Is it over $4.25 a ton?

A Oh, yes.

Q Is it fair to say, Mr. Nugent, and I am not trying to pin you down—would it be in a range from $4.25 to $4.50 per ton?

A It would be a little higher than $4.50. If you want me to make an estimate, I would say it is in the neighborhood of $5.50 a ton.

Q At the Banner dock?

A Yes, sir.

Q Could you tell us, sir, what the average mine price per ton of coal for the Buckheart and Cuba coal is at the Buckheart-Cuba dock?

A Well, coal is sold on a cost per million basis, as delivered.

Now, Banner coal washed will do about 12,000 BTU per pound as received. Cuba coal will do about 10,600 BTU as delivered. So for all practical purposes at a delivered point they are the same.

Now, the difference between 10,600 and 12,000 is—what? Fourteen hundred BTU? Each hundred BTU is worth about 4 cents. That is the difference between the two coals.

[1995] Q Your answer would be the same in regard to Fidelity in 1969?

A Yes, sir.

Q And there has been an advance, has there not—

A Did you say Fidelity?

Q Yes.

A No. Fidelity relates to the Belleville District field.

Q You say the price is different?

A The price in the Belleville District field, because of the difference in transportation, of course, is different.

Q I am talking about f.o.b. mine.

A The f.o.b. mine price, yes, it would be different than Banner. There is no relation between the Belleville field and the Fulton County field. There is a relation between mines in the Fulton County field.

Q In the Fidelity coal at the Belleville, the Belleville District would be based on per million BTU, is that right?

A That's right. The competition is on that basis.

Q I would now like to discuss with you Defendants' Exhibit 63.

Would you please look at Defendants' [1996] Exhibit 63. Do you anticipate, sir, that any of this coal set out on this schedule will not be consumed because of high sulphur characteristics of the coal?

A Well, that is difficult to answer. If they don't consume it, I don't know what they are going to generate power with. Many of these people that are generating power, there isn't any low sulphur coal available. There isn't any low sulphur oil available. Gas is scarce. I would have to assume that some way is going to be found to provide for these people to burn high sulphur coal to generate power.

* * * *

[1999] MR. CUSACK: Could you hand Mr. Nugent a copy of [2000] Defendants' Exhibit 228, please. I know you have one for the Court. You used it on direct.

MR. HEDLUND: I am not arguing with you, Mr. Cusack. I am looking for the document.

MR. CUSACK: I think it may expedite it if I just go over it with the witness.

THE COURT: All right.

MR. HEDLUND: It is Exhibit 229.

MR. CUSACK. I am sorry.

MR. HEDLUND: You need a copy, do you, for the witness, Mr. Cusack?

MR. CUSACK: Yes, please.

MR. HEDLUND: (Handing document to witness.)

BY MR. CUSACK:

Q Mr. Nugent, directing your attention DX-229, the first page, it states that the estimated deep tonnage of the Crown mine is 20,719,000 tons.

A Yes, sir.

Q Is that all high sulphur coal, sir?

A Yes, sir.

Q Orient No. 3 estimated deep tonnage of 33,532,000 tons. Approximately what percentage of that is under

2.5 percent sulphur and what percentage is over 2.5 percent sulphur?

[2001] A All of Orient No. 3 is under 2.5 percent in sulphur.

Q Of the 33,532,000 tons at Orient No. 3, approximately what percentage of those reserves, as set out on the first page of this exhibit, are under 1.5 percent sulphur?

A It is all about at 1.5 percent.

Q In that range?

A 1.4 to 1.5.

Q In regard to Orient No. 4, reserves of 5,315,000 tons, is that high sulphur or low sulphur coal?

A Below 2.5 percent sulphur.

Q Is it above 2 percent?

A In that range.

Q Between 2 to 2.5?

A Yes, sir.

Q Orient No. 5, reserves of 34,035,000, sir, is that high sulphur or low sulphur coal?

A All high sulphur.

Q Above 3.5 percent?

A Yes, sir.

* * * *

[2005]

REDIRECT EXAMINATION

BY MR. HEDLUND:

* * * *

Q Isn't it true that these acquisitions were in the form of an intra-corporate transfer of assets?

A Yes, sir, they were.

Q You referred to the purchase of the Erwin stock. Was that a stock held by J. Erwin Miller?

A Yes, sir.

Q He was a member of the board of United Electric, was he?

A He was at an earlier date, but not, I think, at that time. I am not sure about that, though.

Q With respect to the Defendants' Exhibit 63 on the

committed and uncommitted reserves of United Electric, there is an indication on here that United Electric has a contract with Commonwealth Edison which terminates December 31, 1970.

A Yes, sir.

Q Isn't it true that that portion of the tonnage shipped after July 1st of this year will not be burned in Chicago?

A Commonwealth Edison have so assured us.

Q Isn't it true that any of the other tonnages shown on this schedule that are prohibited from being burned by virtue of local, state or national ordinance, will not be burned at those plants for which this tonnage [2006] had been arranged?

A Yes, sir, that is true.

MR. HEDLUND: I think that is all I have, your Honor.

* * * *

[2012]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,
Friday, April 17, 1970,
10:30 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,
MR. JOHN SARBAUGH,
appeared for Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,
MR. SAMUEL HAUBOLD,
appeared for Defendants.

ALSO PRESENT:

MR. CHARLES BANE,
MR. JAMES M. FOLSOM.

• • • •

[2034]

THOMAS L. CRAIG

DIRECT EXAMINATION

BY MR. EISEN:

Q State your name, please, and your address.

A Thomas L. Craig, 506 Lake Elbert Drive, Winterhaven, Florida.

THE COURT: Will you spell your last name, Mr. Craig?

THE WITNESS: C-r-a-i-g.

THE COURT: All right, the common way.

BY MR. EISEN:

Q By whom are you employed?

A I'm employed by Wellman-Lord, Incorporated.

Q For how long have you been with Wellman-Lord?

A Just over two years.

[2035] Q What is your position at Wellman-Lord, Incorporated?

A I'm manager of pollution control.

Q Could you very briefly state your background, your education and work experience.

A I'm a graduate chemical engineer, 1949. I worked for two years for Shell Oil Company as a technologist in Montreal, Canada. I spent, then, 10 years in various production positions with U. S. Industrial Chemicals in Tuscola, Illinois. I then spent two years with Commonwealth Oil Refining Company of Puerto Rico in their New York office, all of which jobs were in the manufacturing end of the business, or the technical manufacturing end of the business.

I then rejoined United States Industrial Chemicals for a year, and following that I worked for two and a half years for International Minerals and Chemical Company out of Skokie, following which I went into business for myself, and then joined Wellman-Lord.

Q What is the business generally of Wellman-Lord, Incorporated?

A Wellman-Lord is an engineering construction company to the fertilizer chemicals and industrial chemicals industries generally.

[2036] Q Could you explain generally what your duties are with respect to air pollution control.

A Well, I am, as I said, manager of pollution control for Wellman-Lord, and it's a staff position in that I am responsible for the administration of nearly all of our activities in the field of air pollution control. I, for a better term, advise and consent on our technical programs; I supply sales support for our Marketing Department; I do or have done for me economic and technical feasibility studies, for ourselves and for clients as they require it.

Q In the course of your duties, have you become familiar with the research and development of processes designed to remove or recover sulphur oxide emissions from stack gases?

A Yes.

Q Could you tell us briefly what the history of that activity has been.

A Excuse me. Our activity, or generally?

Q Generally.

A Well, over the past five years particularly there has been a number of organizations developing or researching and commercializing processes for the recovery of sulphur oxides, particularly sulphur dioxide, from [2037] stack gases. It started, I would say, about 1966 really in intensity, and the over-all activity has increased rather dramatically since then.

Q Could you give us the reasons for that increase.

A The statutes country-wide on SO_2 levels in the atmosphere have been made just drastically more stringent, let's say, than they had been, and where they have not been made more stringent, let's say, the enforcement of older statutes which had hitherto not been given the time of day, are certainly being pressed more actively.

Q Could you name the companies and organizations which you consider the major institutions or companies engaged in developing and perfecting these devices today?

A Well, I'll start off with Wellman-Lord, and then

there are a number of companies, plus agencies. We have Monsanto, CHEMICO, Combustion Engineering, Universal Oil Products, Consolidation Oil—I am sorry—Consolidation Coal Company, I believe, the Division of Continental Oil, in the United States.

[2038] Q ESSO Research also, or did you mention that?

A No. ESSO Research has announced that they are active in this field.

Q Where is the Universal Oil Products installation, if any? Do they have an installation?

A No, they don't. They have announced an installation.

Q Where is that to be located?

A It's going to be in the greater Chicago area somewhere, and I'm not sure as to the exact location.

Q At a Commonwealth Edison generating station?

A I believe so.

Q Do you know who James R. Garvey is?

A Yes. He's with one of the agencies of the National Coal Association. He's a technical director or—he's got an executive position with one of the coal associations.

Q I would like to read to you, Mr. Garvey—

THE COURT: Craig.

BY MR. EISEN:

Q Mr. Craig. I'm sorry.

I would like to ask you a question, that is, about a statement made by Mr. Garvey to the Joint [2039] Committee on Atomic Energy of the United States Congress, which is contained in Government Exhibit No. 272:

> (Reading) "During the past 10 years I have on numerous occasions appeared before committees of Congress and other governmental agencies to testify on the 'state of the art' of control of sulphur oxides. At one such appearance before the New Jersey State Department of Health on October 6, 1967, I said: 'With all the activity by various research organizations, we are confident that an economically attractive approach for the recovery of sulphur oxides from flue gases will be available in the next three years,

give or take a year.' The purpose of my testimony here today is to bring to your attention the fact that this prediction of about two and one-half years ago was correct."

Would you agree with Mr. Garvey's statement as to—

THE COURT: Just a minute. Is there an objection?

MR. HAUBOLD: Yes, there is, your Honor. I would object on the ground that this is highly leading. I am not sure who is testifying, Mr. Eisen or Mr. Garvey, [2040] and we would object on the basis that it is leading.

We would also like to point out that this exhibit was just handed to us shortly before the session began this morning, and not within the 24-hour period. I do not believe this has been received in evidence.

THE COURT: Is it in evidence or not?

MR. EISEN: I do not know if it is in evidence. We supplied the defendants with a copy of this. I do not know whether I mentioned the date of the document. It is February 25, 1970. When copies of the speech were distributed, we supplied the defendants with copies, telling them that we intended to introduce the document. I have not offered the document.

THE COURT: When was that?

MR. EISEN: We intend to offer it in our rebuttal case, and I think we so indicated to the defense. I know we had indicated it to the defendants.

MR. HEDLUND: Yes. That is true, your Honor, but in terms of the 24-hour rule in using documents with a witness, that has not been abided by.

Secondly, if that document was to go into the rebuttal case, it was to go in as a third-party publication, if you will, and not as a document to be used to examine witnesses on.

[2041] THE COURT: I did not hear the latter part of your statement.

MR. HEDLUND: And not to be used as an exhibit to examine witnesses on.

MR. EISEN: I do not understand, your Honor. I was just going to ask him to state whether or not in his opinion that was an accurate prediction, or if he agreed with that statement.

MR. HAUBOLD: Your Honor, it would seem to me that he can ask Mr. Craig for his opinion in various areas, but I think it is improper on direct examination to quote at length an opinion by some third party and then ask the witness whether he agrees with it.

THE COURT: Well, it may go in subject to the objection, so we can proceed. You will have the right to examine it.

Do you understand the question, sir?

THE WITNESS: Yes, your Honor.

THE COURT: All right.

[2042] BY THE WITNESS:

A Could I ask to have it re-read, the part where he said in how many years from 1966 or '67 he had made the statement?

BY MR. EISEN:

Q He says that:

(Reading) "This prediction of about two and one-half years ago was correct."

The statement was made February 25, 1970.

MR. HEDLUND: That is not true.

THE WITNESS: Your Honor, may I ask—really, the conversation has got me puzzled.

THE COURT: Will you restate the question.

BY MR. EISEN:

Q Mr. Garvey was quoting a statement that he had previously made on October 6, 1967 before the State of New Jersey Department of Health, where he said:

(Reading) "With all of the activity by carious research organizations, we are confident that an economically attractive approach for recovery of sulphur oxides from flue gases will be available in the next three years, give or take a year. The purpose of my testimony here today is to bring [2043] to your attention the fact that this prediction of about two and one-half years ago was correct."

My question to you was whether you agree with his statement.

A Yes.

Q He goes on to say:

(Reading) "We now have commercial processes available for use, although their economic attractiveness may not be all we desire. The added cost for sulphur oxide control may increase the cost of electricity to residential consumers by at least three and perhaps eight percent."

I would like to ask you, Mr. Craig, whether or not you agree with the cost spread of these control devices as expressed by Mr. Garvey?

MR. HAUBOLD: Your Honor, I object. I do not believe he has laid a foundation as to this witness' knowledge in the area of electrical cost to consumers.

THE COURT: Objection sustained. Lay the foundation.

BY MR. EISEN:

Q Mr. Craig, is it part of your duties to cost out the installation of air pollution control devices, particularly Wellman-Lord's, when used in conjunction [2044] with electrical generating facilities?

A Yes.

Q Would you say that, based on your knowledge and experience, that Mr. Garvey's cost spread is an accurate one?

THE WITNESS: Excuse me, your Honor. May I question counsel?

BY THE WITNESS:

A Was that the three to eight percent?

BY MR. EISEN:

Q Three to eight percent.

A Yes.

Q Are some recovery techniques designed to produce a saleable product?

A Yes.

Q Would that factor affect the increase in cost with the installation of a pollution control device?

A Yes.

Q Would you explain what factors would be involved as far as how that might affect a cost?

A Well, when we project the operating cost which, of course, follows the projection of the capital cost, we project the capital cost, then we project the operating cost for a given generating station. We come [2045] up with a gross operating cost from which we subtract a part of that gross operating cost, which reflects the credit we assign to the sale of the recovered material.

Q I do not know that you have explained as far as—When you refer to recovered material, what are you referring to?

A Well, for our particular process, it can be SO_2 gas, SO_2 liquid, sulphuric acid or sulphur.

Q Do some processes of desulphurization recover materials or chemicals such as this and others not so?

A Yes.

THE WITNESS: Your Honor, can I give a qualified answer to these questions?

THE COURT: Yes, you may qualify your answers.

[2046] BY THE WITNESS:

A (Continuing.) There are some materials recovered with some of the processes being offered which are less saleable than some others. The sulphuric acid or sulphur is a saleable material. The sulphur-laden limestone, let's say, from the TVA or—I'm sorry—the Bureau of Mines, or the Combustion Engineering process, would not be as saleable. In fact, they may not be saleable at all.

BY MR. EISEN:

Q Is it possible that with one of these recovery processes through the sale of the recovered chemical, that a utility might install such a process without any increased cost to itself?

A I cannot give you a yes or no, but I strongly doubt it.

Q If there was a chemical plant adjacent to an electrical generating station which could use the recovered

product, would this have a substantial effect on the cost, net cost to the utility?

A If the utility and chemical plant were both of a relatively large size, and I'm thinking in terms of something in the neighborhood of 600 or 700 megawatts and above, you could possibly break even.

[2047] Q So that in an instance like that, it would not be at any net cost, additional cost to the utility?

A Yes, but again I must say that this would be a rare happy marriage. It could happen.

THE COURT: Do you know of any such situation at the present time?

THE WITNESS: Again, your Honor, I'm going to have to qualify my statement. I know of some situations, but I know of them in the context of Wellman-Lord. I don't know that the utility and the chemical company would necessarily agree.

BY MR. EISEN:

Q Is there such a situation that exists in the Chicago area?

A Yes.

Q Where is that?

A I have been instructed by my counsel to refrain from answering any questions along either tachnical confidentiality or business confidentiality without first checking with them.

THE COURT: The Court directs that you answer.

MR. EISEN: Your Honor, I have to apologize. I did not intend to get into this. I will withdraw the question for now.

[2048] THE COURT: All right.

MR. EISEN: I apparently have surprised the witness with the question, so I will withdraw it for now.

MR. HAUBOLD: Your Honor, I move to strike the prior question and answer.

THE COURT: Which one, the Court's question or Mr. Eisen's question?

MR. HAUBOLD: Reluctantly, the Court's question.

THE COURT: It may stand.

BY MR. EISEN:

Q When did Wellman-Lord commence the development of its process?

A In late 1965 or 1966. We did the original literature research on the processes for SO_2 recovery from stack gases which were then available. These were primarily outside of some work which had been done by the Federal agencies of the U. S. Government. These were processes that were available in Germany and in Japan.

We investigated what was available, and it did not look like anything available was going to be attractive, so we decided to make a try at developing a novel process of our own, and put together a conceptual paper study in 1966, which was the beginning of the [2049] Wellman-Lord SO_2 recovery process.

Q Could you describe the process and what it does?

A It's a wet scrubbing regenerative process. We contact the stack gas with an absorbing solution. The absorbing solution removes the sulphur dioxide and the sulphur trioxide, the fly ash, and we then take that sulphur dioxide laden material and regenerate by using some form of energy—in our case it's steam—and drive off the concentrated sulphur dioxide from this rich material, and then return the de-enriched material back into the system to absorb the sulphur dioxide again.

So, it's a recycling, recirculating regenerative system.

[2050] Q Where has this system been used?

A We used it at a very small pilot plant at the Tampa Electric Gannon Station in Tampa, Florida. We used it at a demonstration plant at the Baltimore Gas & Electric facilities at the Crane Station of Baltimore Gas & Electric, just outside of Baltimore. And that is where we have used it.

Q When did you begin to use it at the Gannon Station? The Gannon Station is at Tampa?

A Right.

Q When was that, sir?

A We did the original work there in 1967.

Q When was it installed at the Baltimore Gas & Electric?

A We started it up early January 1969.

Q Was that on an old Baltimore Gas & Electric installation?

A The Crane Station on which we installed the demonstration plant, I think, was five or six years old.

Q Did you do that yourself, or was that in conjunction with others?

A There were seven parties involved in the founding and the operation of the plant.

Q Other corporations or municipalities? [2051] Governmental bodies?

A Would you like me to name them?

Q That won't be necessary.

A There were four utilities and three private companies.

Q What was your experience at the Baltimore Gas & Electric demonstration plant?

A We verified the chemistry. We proved out the thermodynamics, and we had a number of problems.

Q What were those?

A The biggest single problem was our energy costs that we projected we never met at Baltimore. The actual energy requirements, the steam requirement, the power requirement, was about double. That was the biggest single problem.

The second biggest problem was the inability to keep the plant line because of difficulties primarily with fly ash.

Q What have you done, if anything, to solve these problems?

A We switched from a potassium based system to a sodium based system, where we expect the energy requirements to be more in line with our original projections, and in mid-February and early March did [2052] some additional work at the Tampa Electric Gannon Station to check out a redesign of our pre-scrubber section of the plant for the removal of fly ash.

[2053] Q Do you offer your present process as a commercially feasible process to utilities?

A Yes.

Q Do you make any guarantees?

A Our guarantees are limited to the efficiency of SO_2

removal. We guarantee 90 percent removal of SO_2 in the stack gas, 97½ percent of the SO_2 in the stack gas, and in excess of 85 percent of the—I am sorry. I gave that backwards.

It is in excess of 97½ percent of the fly ash in the stack gas and in excess of 85 percent of the SO_2 in the stack gas.

Q Have you had inquiries or negotiations with any utilities in the State of Illinois with regard to your process?

A We have had inquiries. We have had no negotiations.

Q What companies have you talked to?

A We have spoken to Commonwealth Edison. We have spoken to Central Illinois Lighting & Power, I believe, whose offices are in Peoria.

Q Any others?

A Not that I can be certain of.

Q What systems, in your opinion, are now available [2054] for commercial usage? I believe you have testified that you believe your system is available for commercial uses, is that correct?

A Yes.

Q What other companies are there—

MR. HAUBOLD: Your Honor, I object.

THE COURT: Let him finish his question.

BY MR. EISEN:

Q —which, to your knowledge, are offered it a guaranteed basis?

A The Monsanto process has a guarantee, and as for the others, I cannot speak for their guarantees.

Q When you talk in terms of guarantees, at least so far as Wellman-Lord is concerned, how do these guarantees compare with the guarantees Wellman-Lord offers with regard to its other processes?

MR. HAUBOLD: I object unless Mr. Eisen specifies a little more clearly what other processes he is referring to.

THE COURT: Reframe your question.

[2055] BY MR. EISEN:

Q I am afraid we skipped over something when I was asking about Wellman-Lord.

Could you describe just generally what the business of Wellman-Lord Company is with regard to chemical processes?

A Wellman-Lord is predominantly involved in the agriculture and industrial chemical sectors. We offer sulphuric acid plants, phosphoric acid plants, nitric plants, phosphate chemical plants, phosphate chemical plants as related to the fertilizer chemical industry.

We offer fluoride and fluorine recovery processes. We offer processes for the manufacture of fluosilicic acid, a water fluoridation chemical. We offer process for the production of hydrofluoric acid, which is used in fluocarbons.

We offer general construction services to industry. We recently have constructed an aircraft assembly plant, and we are presently engaged in doing some work for a major cement company.

Q That will be sufficient for my next question.

Mr. Craig, do you offer reliability guarantees, reliability of operation guarantees, on these processes?

[2056] A We guarantee a production rate. In other words, the client is given a guarantee that the plant will produce so many tons per day and we assure him that the plant will run for so many days per year.

Q Do you give a similar reliability guarantee to the SO_2 removal process?

A That's right. Yes.

Q Do you know whether or not there are any sulphur removal processes presently in operation on utilities in the United States?

A I didn't hear the question.

THE COURT: Read the question.

(Question read by the reporter.)

BY MR. EISEN:

Q That would be utility generating stations.

A I know of the one in the Kansas Power & Light, in Lawrence.

Q Are there any in operation in other countries that you know of?

A Not to my knowledge.

Q What is the Reinluft process?

A It is an older German process which uses an activated char as an absorbent. In other words, as compared to our wet system, it uses a dry system.

[2057] Q Is that in active operation now, that system?

A I don't know. I believe so.

Q Is your system being used abroad.

A No.

Q Did a Japanese company or companies secure a license to use the Wellman-Lord process?

A Yes.

Q What companies are those?

A Mitsubishi Heavy Machinery Company and Sumatoma Chemical Engineering Company jointly licensed the rights to our process.

Q Could you tell us, if you know, what if anything they have done with the Wellman-Lord process?

A They are offering it—period. They have not consummated anything with anyone.

Q Have they carried on further development on their own of your process?

A Yes.

MR. EISEN: No more questions.

THE COURT: Any cross examination?

MR. HAUBOLD: Yes, your Honor.

* * * *

[2062] CROSS EXAMINATION

BY MR. HAUBOLD:

* * * *

Q So, if I understand you correctly, to increase the reliability of the system, an electric utility, for example, would have to expend considerably more money to install back-up equipment?

A More. Not necessarily considerably more. More money, certainly.

Q Do you have any opinion as to what specific quantity guarantees in terms of number of days per year Wellman-Lord would be prepared to make? Let me rephrase the question.

Would Wellman-Lord be prepared to guarantee continuous operation of your system for 300 days a year?

A Yes.

Q I understand, Mr. Craig, that the system that Wellman-Lord devised has been used on only one sized power facility thus far, has it not?

A Right.

Q At Baltimore Gas & Electric?

A Right.

Q Isn't it a fact that at the Baltimore Gas & Electric plant that Wellman-Lord was only able to achieve continuous operation at rate for only 20 percent of the time?

A That's right.

* * * *

[2065] Q Is is a fact that based on the current projections of Wellman-Lord's in connection with a sodium-based system for a 500 megawatt generating facility, that you now are estimating investment costs of $15.50 per kilowatt?

A Yes.

Q And is it not a fact also that you are currently estimating that cost per ton of coal burned in dollars per ton at $1.60 in the 500 megawatt—

A Yes.

Q Mr. Craig, can you predict with any reasonable degree of engineering certainty when the Wellman-Lord or any sulphur dioxide process for that matter will be demonstrated to be economically feasible in an electric utility power generating facility?

A Can I have that rephrased?

THE COURT: Read the question.

Q (Read by the Reported.)

BY THE WITNESS:

A May I ask, your Honor, what counsel means by "economically feasible."

BY MR. HAUBOLD:

Q Well, in the context of this question shall I say—if I rephrased it and make it "commercially [2066] feasible," does that assist you?

A Yes.

• • • •

[2068] Q In terms of reliability, I take it what you are saying is the utilities have to have virtually complete reliability so that they are not faced with the possibility of either polluting the air or turning the lights off?

A No. If you will pardon me, the utility wants to have a device which will permit them neither to pollute the air nor turn the lights out. They don't have to have that.

Q Do you have any opinion whatsoever when the Wellman-Lord process or any other process will become commercially acceptable?

A I would say within five years.

Q Mr. Craig, I would like to ask you about some of the assumptions made in the compilation of some of your cost projections. We have talked about the current cost projections which are in excess of those contained in Defendants' Exhibit 89. If I understand the Wellman-Lord process correctly, you assume there is a byproduct credit. In other words, the cost is diminished because the process can recover some commercially saleable product is that correct?

A Right.

Q You also have assumed, have you not, that a [2069] utility purchasing this Wellman-Lord system would necessarily market this product, would have to sell it to someone, is that correct?

A Yes.

Q Isn't is a fact, Mr. Craig, that the economics of marketing sulphur dioxide or elemental sulphur is highly dependent upon where a plant will be located?

A Yes.

Q Isn't it also a fact that a plant located in a non-urban area which would not be adjacent to convenient transportation to the natural markets for sulphur or

sulphur dioxide would experience higher economic costs in the operation of their sulphur control device?

A Yes.

Q In fact, Mr. Craig, there are situations, which might exist in less urban areas, where it might cost a utility money to dispose of the product. There may be a byproduct deficit rather a credit.

A Yes.

MR. EISEN: Your Honor, I know I left the last question and answer go by, but I think, unless it is limited to our marketing area, I would move that both the question and the answer be stricken as being outside the scope of the complaint.

* * * *

[2075] Q In fact, Mr. Craig, the difficulties involved in the operation of the Baltimore unit with the potassium system of Wellman-Lord were so great that Wellman-Lord has, in effect, scrapped this system for utility power generation use.

A I will qualify that. Certainly for coals above 1.5 percent sulphur, yes. We recommend sodium system.

Q Is it not a fact, Mr. Craig, that the sodium based Wellman-Lord system which you are now recommending has never been employed on a utility power generation facility comparable in size to the Baltimore Gas & Electric plant?

A Yes, that is a fact.

Q You testified that you received financial help in financing the Baltimore Gas & Electric facility, did you not?

A Right.

Q A number of the contributors to this project were electric utilities, were they not?

A Yes.

Q Have any of the electric utilities which participated in the Baltimore Gas & Electric joint venture agreed to install either the Wellman-Lord [2076] potassium or the sodium system on any of their utility power plants?

A No.

Q In fact, has any electric utility committed itself to

install or employ the Wellman-Lord process, either sodium or potassium, on a power generation facility?

A No.

Q Has the Federal Government granted any money to Wellman-Lord for development of this system?

A No.

Q Did you within the last year, and by "you," I mean Wellman-Lord, submit certain cost figures to the Government in connection with the Stanford Research Institute project?

A We submitted data to Stanford Research.

Q Involving the economics of the system, is it not?

A Yes.

Q You also supplied to them certain information concerning the operation of the system?

A Yes.

* * * *

[2080] REDIRECT EXAMINATION

BY MR. EISEN:

Q Mr. Craig, is there a greater problem in getting rid of pseudo-gypsum than is involved with getting [2081] rid of the radioactive waste materials from nuclear plants?

MR. HAUBOLD: I object unless Mr. Eisen can lay any foundation as to the witness' knowledge in terms of radioactive disposal.

THE COURT: Objection sustained. Reframe your question. Lay the foundation.

BY MR. EISEN:

Q Counsel asked you whether you have had some familiarity with Combustion Engineering's process and the waste material given off by that process, is that correct?

A Yes.

Q Are you familiar with your contacts in the energy field with the radioactive waste products given off by nuclear plants?

A No.

Q Do you believe that Wellman-Lord will be able to sell an SO_2 recovery system to any electric utility within the next two to five years?

A Yes.

Q You referred to a nominal size utility. Could you tell us what you meant by that?

A Something from 250 megawatts up.

[2082] Q I believe counsel asked you whether Mr. Griswold, who got out this report on behalf of the defendants—

A Right.

Q (Continuing)—whether he was well renowned.

What is the reputation of John Middleton, the Assistant Secretary of Health, Education & Welfare in charge of pollution?

A A very dynamic, progressive individual who looks like he's going to get something done.

Q The cost figures represented in Defendants' Exhibit 89, which was shown to you, on page 43 thereof, do you recall that?

A Yes.

Q Are those cost figures generally within the parameters as stated by Mr. Garvey that I asked you about on direct examination?

A Excuse me. Is that—

MR. HAUBOLD: I object, your Honor. I think it is very unclear and vague as to what Mr. Eisen is referring to when he says "parameters."

THE COURT: If the witness knows what the word means, he may answer in the context in which it is put.

[2083] BY THE WITNESS:

A Excuse me. Is this referring to Mr. Garvey's three to eight percent?

[2084] BY MR. EISEN:

Q Three to eight percent increase in cost.

A Increase in the cost?

Q Yes.

MR. HAUBOLD: Your Honor, the statement read by Mr. Eisen concerned a cost of electricity to residential

consumers and I do not believe that the cost figures which have been set forth in Defendants' Exhibit 89 purport to reflect such figures or that they even purport to include or involve cost to residential consumers.

THE COURT: How are they comparable?

MR. EISEN: I would think it is self-evident, your Honor, that the cost would be reflected in the cost of electricity to the consumer. That is what Mr. Garvey is referring to in his speech.

THE COURT: I do not know. There is nothing in the record whether it is to a consumer, to a manufacturer's plant or what, and it is my understanding of the testimony that you have all different types of rates. That is, not of this witness, but the testimony in the record, and I think it should be shown how one is connected with the other, if at all.

How much longer are you going to take?

MR. EISEN: Just about two minutes, your Honor.

[2085] THE COURT: All right. Proceed.

BY MR. EISEN:

Q Mr. Craig, what would be the percentage of cost of fuel—production of electricity, excuse me, to a utility if they were to employ the Wellman-Lord sodium process?

THE WITNESS: I have to qualify this answer, your Honor.

THE COURT: You may.

BY THE WITNESS:

A On the fact that Wellman-Lord projects costs from Wellman-Lord's knowledge of the accounting art, and this does not necessarily mean that it agrees with the utilities art. Generally, the answer to that question as we project the costs is about 10 percent.

BY MR. EISEN:

Q Do you have an opinion on the saleability of sulphur or sulphur compounds as are produced by these systems in the state of Illinois?

A Yes, I have an opinion.

Q What is that?

A It should be reasonably good.

Q Would you say, Mr. Craig, that considering the amount of public opinion that has been marshalled [2086] to solve the environmental and ecological problems which this country and the world is facing today, and the amount of concentrated effort by scientists, technology and governmental bodies, that we will solve the SO, emission problem from stack gases of coal generating stations in the next five years?

MR. HAUBOLD: I just object on the fact that it is a highly leading question, your Honor, and sounds like Mr. Eisen is testifying.

THE COURT: It is what?

MR. HAUBOLD: It is a leading question.

THE COURT: Oh, he may answer, if the witness knows.

BY THE WITNESS:

A There is no question about it.

THE COURT: You asked the same question.

MR. EISEN: Thank you, your Honor.

THE COURT: All right. Is there any recross?

MR. HAUBOLD: No further questions, your Honor.

THE COURT: All right. Thank you, sir. You are excused. You can go back to Florida.

(Witness excused.)

MR. CUSACK: Your Honor, I hate to burden the Court with one very slight matter on your instructions.

THE COURT: All right.

• • • •

[2090]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Judge,
Monday, April 20, 1970,
10:30 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. HUGO SIMS,
appeared for plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,
appeared for defendants;

ALSO PRESENT:

MR. JAMES M. FOLSOM

* * * *

[2098] PETER O STEINER,

called by the defendants herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HEDLUND:

Q For the record, would you please state your name and present occupation.

A Peter O. Steiner, professor of economics and law at the University of Michigan.

THE COURT: Would you spell your last name?

THE WITNESS: S-t-e-i-n-e-r.

THE COURT: Thank you.

BY MR. HEDLUND:

Q You are, Professor Steiner, a member of the law faculty of the University of Michigan, is that correct?

A Yes, I am.

Q Would you just briefly tell me what degrees that you have and from which institutions and which years.

A I have a Bachelor of Arts degree from Oberlin College in Oberlin, Ohio in 1943, a Master's degree in economics from Harvard University in 1949, [2099] a PhD. degree in economics from Harvard in 1950.

MR. HEDLUND: Your Honor, the rest of Professor Steiner's qualifications and background are in evidence already as a deposition exhibit of his deposition. I do want to ask one further question.

BY MR. HEDLUND:

Q You have, Professor Steiner, have you not, published a textbook on economics with another author?

A Yes, I have.

Q Could you tell me what the name of that textbook is?

A It is called Economics.

Q Could you just generally describe the purpose and function of that book?

A It is one of a number of books that are provided for the basic first year course in economics.

Our particular book, I have a co-author on this, is designed for what we feel are the more rigorous better first year courses.

Q Could you give me some idea—well, let me ask you first how many editions of this have been published?

A It is now in its second edition. We are at work on the third.

[2100] Q Can you give me some idea of the extent to which this textbook is used on college campuses in the country?

A I just got a publisher's brochure that advertised in the first year of the second edition it had been adopted by 140 colleges or universities.

Q 140?

A Yes.

Q Professor Steiner, since you were asked by the defendants to become involved in this litigation last year, could you give me a rough estimate of the amount of time that you have spent in familiarizing yourself with the record in this case and the documents and in working generally in terms of analyzing the data?

A In elapsed time it has been something over a year. In terms of total hours, if I may give you just a rough guess, I would think between 400 and 500 hours.

Q Could you tell me generally what portions of the record, including the trial, that you have tried to become familiar with?

A I have either attended or read the entire transcript of the trial. I have read all of the [2101] depositions at least once. Some I have read twice.

I have looked at most, though I do not think all, of the deposition exhibits. I have looked at a great deal of the associated matter that applies to interrogatories and so on.

Q What about exhibits that have been introduced here at trial?

A I believe I have looked at all of these. I don't guarantee I remember everything that was in this entire record.

Q As an economist, Professor Steiner, what do you believe generally are the basic steps one must first take in attempting to evaluate the effect of a given merger?

A I think it may be convenient to visualize that evaluation as taking place in three steps.

First is some determination of the relevant market or markets in which the parties to the merger engage.

Second, in forming some judgment as to the intensity of competition in each of those markets and, third, in evaluating the effects on that competition on the intensity of that competition of the merger in question.

[2102] Q Taking the first step, that is the determination of the relevant market or markets in which the merger has taken place, can you describe for me, generally, what is involved in such a determination and exactly what, if I may ask, what your meaning of or what your meaning is when you use the word "market" or "relevant market"?

A Well, I think that when any economist uses the word "competition," they mean competition in a market.

I think there is no magic formula.

May I start by saying, I think that a market is a collection of relevant—or a collection of similar transactions. If you think of any transaction which is in one sense unique, it has a buyer, it has a seller, it has a well-defined good or service that is exchanged, it has a price, it often has a contract of sale and so on.

A market is usually an attempt to delineate a collection of transactions that are sufficiently similar either in their buyers or in their sellers—or in the intersection of the set of buyers and sellers—that it makes more sense and understanding in what determines that transaction to consider them collectively than to consider them separately; so that my feeling is one looks at the facts of a particular set of transactions, looks at the [2103] purpose one has in mind and attempts to decide which collection of all possible transactions are best included and which are best excluded.

It is always a question of defining boundary lines that includes some transactions and exclude others.

Q Is it not true that in a sense all such transactions or all transactions are unique?

A Sure, all transactions are unique but some are sufficiently similar that there is more than insight in looking at them as a group than in looking at them separately.

Q In looking at them as a group is it necessary to take a look at or to evaluate the time or the place of the transaction?

A I find it very difficult to discuss what is a useful set of transactions without defining more precisely the purpose one has in mind. Once one has defined a set of transactions that appear to be the sensible one for a particular purpose, they usually have a geographic area, and a period of time that is part of that definition. But it is in a sense the set of like transactions that determines the area and the time rather than the other way around, and that in turn seems to me is determined by what it is you are looking for, what [2104] question you are asking and that you then structure the market to best answer the particular question.

[2105] Q How does one determine as an economist the extent of a market, or, if you will, its geographic reach?

A Well, sometimes that is very easy and sometimes it is very hard. It may well be that one has a defined set of transactions that appear to be the ones that one is concerned with, and it then appears that the, let us say, buyers in that set of transactions are in a well-defined, narrowly-defined area. It may well be that the sellers in that group of transactions are confined in a well-defined area, and it may indeed be that both buyers and sellers are in a particular area or areas. Thus, one cannot, it seems to me draw lines around the market or around the set of transactions in terms of locations of buyers or in terms of the locations of sellers.

Alternatively, sometimes one talks of markets in terms of where the transaction takes place and simply the place of transacting, or the place of delivery as distinct from the home offices of either buyers or sellers.

Q To what extent can the political boundaries of a state actually define the extent of a market?

A Well, I think when one draws boundaries [2106] around an economically meaningful set of transactions, it would be unlikely that a purely political boundary would encompass them although I suppose there are some cases where that might be so.

I suppose that where there are state laws that strongly affected the transportation of this commodity, it might well be that a state boundary in that reach of the law or that reach of taxes, something of this kind, define them.

It might be that in approximating a market one would describe it most sensibly in terms of the state or group of states or subdivision of a state.

I suppose what I am saying here is that the set of transactions have to be described some way and it's frequently possible to describe it in terms of geographic areas.

Other times—sometimes these would be political subdivisions—other times it might be such things as a river valley, or along a railroad line which might very well cross state lines; something of that kind.

[2107] Q Will the fact that all the buyers buying a particular product are located in one state, and all the suppliers selling that product are located in one state, would this in and of itself indicate that there is a state market for that product?

A If I understand what you are saying, you are saying that all suppliers to this group of sellers are within that state and we are dealing with a group of customers who are entirely within the state.

In that case, it would seem to me clear that the market, if those were the facts, would be no larger than the state.

I think I would want to inquire further, it might well be that there were smaller markets; for example, if all the buyers in the north half of the state purchased from a group of—one group of suppliers—all the purchasers in the southern half of the state purchased from a quite distinct set of suppliers, it would seem to me it would make more sense to speak of the two separate markets in that hypothetical case.

Q In changing the hypothetical a little bit differently, if all of the buyers in a particular state buy most of the products from the suppliers in that state, and if the suppliers in that state sell most or a [2108] substantial portion of their production to buyers in that state, would that alone indicate that the state is an economically meaningful market?

A I don't think that would alone indicate it. It would certainly push us in that direction. I say that because,

again, there is some possibility that a subdivision—that there would be many markets contained within that area.

It might also be, and I would be interested in whether —in what you mean by most and how influential is the supply that comes in from outside.

Oh, I think in terms of the competitive influence, perhaps, of this supply that comes in from outside, and it might well be that the barest price rise from suppliers within the state would lead that percentage that was coming from outside to expand greatly.

That would seem to me to indicate that the relevant suppliers might well be more widely distributed than the state as well as possibly being less widely distributed in the sense of coming only from a particular portion of the state.

Q Now, I mentioned the word "product" without defining it in the hypothetical that I gave you.

Would it be necessary to know to what extent [2109] that product was interchangeable or could be displaced by a different type of product, but one that could be used for the same purpose.

A Yes, indeed. I assumed there that we previously defined the relevant product but it seems to be quite clear that a particular product defined by certain characteristics might itself either be too broad or too narrow.

Oh, I think in the coal industry with which we are concerned it seems clear that, for example, metallurgical coal may usefully be distinguished from steam coal in terms of lots of factors, including its chemical properties and its price. It seems, furthermore, that it may well be from the point of view of many purchasers that other products are used interchangeably or used as substitutes for that product and from the point of view of those users, for example, gas or nuclear energy may be an alternative source of supply. Thus I would think in an economic sense, in evaluating the market for these certain kinds of purposes, for the extent of competition, one has to inquire quite closely as to whether a particular commodity is a product around which one wishes to define the market, the econo[illegible] market, and to evaluate the effect of competition.

[2110] Q The second step that you mentioned that must be taken in evaluating the effects of any given merger was an evaluation of the intensity of competition in the market in which the merger takes place.

Could you tell me how as an economist one attempts to make that evaluation?

A Well, we have no magic barometer, we have no thermometer, something that simply tells us whether competition is intense or not. We've worried a great deal about it over the years. We tend to say we look for indicia of competitiveness and we look at these often, which sometimes is useful to try and define three different kinds of indications or aspects of the problem of competition; some of which are described as structural things such as the number and size distribution of the sellers; the number and size distribution of buyers; the ease with which entry can occur into the industry or exit can occur; the nature of the product, and that sort of thing.

Secondly—

Q May I interrupt you there?

A Sure.

Q You mentioned the nature of the buyers, I'm sorry, the nature of the product. Would the nature of [2111] the buyers be important in terms of the structural aspects?

A Surely. Lots of aspects of this are, really, characteristics of buyers, characteristics of sellers, characteristics of products. All are important.

For example, one would expect—there is good theory to suggest that well-informed buyers may behave quite differently than poorly-informed buyers—that buyers who make purchasing a major executive responsibility may in effect behave differently than where it is a relatively low level of responsibility, where repetitive major purchases are made can be distinguished from incidental single purchases, all of these characteristics are part of the web of structural conditions that perhaps economists have used at one time or another to attempt to understand market behavior, market performance which are the second, and third—or the third and second—things I want to talk about.

Q Would you, you mentioned market behavior and market performance. What do you mean by market behavior and how that perhaps can be determined?

A Well, market behavior means the way in which the actors in a market—the sellers and the buyers [2112] behave, really. At one extreme, take something that is familiar to all lawyers, collusive behavior—is taken to be by itself a very strong indication of the absence of competition.

The word competition itself, I think, can be used as a behaviorial rather than a structural word, a form of striving, a sense of competition, one against the other; and then the whole pattern then of interrelation, of behaviorial patterns among sellers, among buyers, or the way buyers negotiate with sellers is part of the behaviorial parameters of a particular market.

Q The third factor I think you mentioned is performance.

I would like to ask you what you mean by that and what one does to determine the performance in the particular market?

A Well, again, economists have certain ideals, certain models of how a well functioning market works in terms of achieving low levels of cost of production, trying to produce at something like minimal obtainable cost, and trying to argue that in a well functioning market, price will be forced by competition down toward the levels of cost, that there will be continuous [2113] downward pressures on price and on cost; secondly, as a behaviorial—excuse me—as a performance aspect is really the degree of responsiveness of a market. Markets, and industries, are faced by changes that get imposed upon them, and a well functioning market responds quickly to the challenges put upon it.

If there is an increase in demand, it responds with an expansion of capacity. If there is a change in the nature of demand it adapts quickly to this. In a sense a monopolistic market is often regarded as retarding, holding back those changes for the purpose of the monopolist's profit.

This whole question of progressiveness—it's sometimes called by economists—adaptability, the rapidity, the ef-

fectiveness with which they adapt is a measure of performance, so that—well, to summarize it in a couple of words—economists often look to the nature of price, to the nature of quality of product, to the rate of innovation, to the rapidity of adjustment to change, as some of the kinds of things you expect a market to do, and therefore you attempt to judge how well a market has performed by comparing these things to what might have been reasonably expected of it.

[2114] These things are hard to measure clearly. One doesn't know always how a market would have performed under different circumstances, so one is asking a question of comparing how it did perform against a notion of how it might reasonably have been expected to perform.

[2115] Q You have now discussed three dimensions or aspects of the step of evaluating the intensity of competition in the market and you mentioned structural aspects, the behaviorial and performance aspects.

Is any single one of these the governing dimension in terms of making the evaluation of the intensity of competition existing in a market?

A Well, I think if we could measure them all we would say we cared about performance. Performance is tricky to measure. It's because we think—care about it—that we hope as economists and as lawyers—I think you hope to find links between behavior and performance because it's easier to measure behavior, to observe behavior or to measure structure than it is to make a final evaluation.

It seems to me, for example, that the very clear legal dislike of price fixing is based on the presumption that this form of behavior so inherently leads to poor performance that we are prepared to regard that as evidence of probable poor performance and not inquire further.

In much the same way we tend to regard monopoly as a structural kind of control in the hands of one or a very small number of sellers, is so inherently [2116] likely to lead to poor performance that without more we will regard that as adverse and it certainly is a signal that leads us to look beyond.

If I may go further than that in my answer, it is, I think, at one's hazard except in these extremes and well defined cases, one's hazard takes structural indications alone as a measure of what performance will be. Economists, I think, hope that there will prove to be some easy classification of markets; you can in such and such a set of cases, it is inherently likely to prove anticompetitive and therefore we need not look further.

Now, just as in the law there are certain extremes where we are willing to use per se rules, so I think economists say at certain extremes they are satisfied but for the great bulk of business behavior it's usually necessary to inquire further, and it seems to me that is perhaps why one has major antitrust suits because it is necessary to inquire as to what the facts are.

Q I gather then what you are saying is that the data with respect to concentration, with respect to the size of sellers or indeed the size of buyers, that this is not alone enough to determine what the level of [2117] competition is in any given market?

A Well, that's right. I think that I would say that if we have a properly defined market, one in which we are in effect evaluating, knowing things like market shares and concentration ratios is a great help and it may be that they are at one extreme or the other—either so very small market shares that we say there is inherently no reason to suspect on the structural side any adverse effect (although conceivably there still then could be a set of behavioral activities of the sellers that would lead us to look with suspicion.)

Or, on the other hand, it might be so high that one would say without more one is prepared to regard that as so probably anticompetitive that it's not worth a great deal of time and energy in determination.

But frequently, I really want to say two things here—frequently one is not at either one of those extremes, one is at an area where one wants to look further; secondly, and a point that I think is terribly important that a concentration ratio is never any better than the delineation of the market in which it is measured or a market share, and thus to evaluate a concentration ratio you

have to be satisfied that it is measured in a proper economic market.

[2118] Thus, it seems to me, when one is taking concentration as a proxy for degree of competition, if that is so, one must worry about how good a proxy it is, and, second, whether it's measured in a relevant market.

I think both of those things lead me to want to look beyond the concentration although not denying that concentration is of substantial importance, that we have many statistical associations between concentration and market behavior and between concentration and market performance.

[2119] Q For purposes of illustration could you give me an example of where the concentration statistics would compel you to believe that the market was not competitive but where this becomes misleading because of the, say, unrealistic definition of that market?

A Well, let me give you an example based slightly on my own experience and a few blocks away. I think some years ago there was a merger of the Continental-Illinois National Bank and the City National Bank, two banks out of the 15,000 in the United States, two banks out of the two in the 200 South block of LaSalle Street.

If one regarded that merger alternatively as being a change in the number of banks in the United States from 15,000 to 14,999, one might say that is a trivial change in concentration and say the effect was de minimis.

It seems to me that would be unwarranted. It was not true all of those banks were, in the real sense, in the same market.

By the same token, you might have regarded that as two banks on the 200 block of South LaSalle Street and said the effect of that was to go from two sellers to one seller and see the creation of [2120] a monopoly. It seems to me at the other extreme that was equally unwarranted.

There are alternative definitions. Whether it was the Chicago Metropolitan area or a wider area that was the relevant market had to be determined before one could compute market shares, concentration ratios and make sense of them. In that absurdity of extremes there, you

can always draw a circle around a seller in such a way that he is a monopoly.

You can always define a group of buyers for which he is the only seller.

[2121] One can create a statistical monopoly without having created an economic reality.

It seems to me the economic realities of who the suppliers are and the alternative suppliers are what control when we determine how intensive competition is.

Q Professor Steiner, if you will, I would like to get down to some of the facts in this case.

A I thought you might.

Q You have become familiar, have you not, with the Government exhibits in this case, relating to the number of producers in Illinois in the period of 1957 to 1967, have you?

A Yes.

Q And you have become familiar with the Government exhibits with respect to, not the number of companies, but the number of "leading companies" and their production share in the three-state area of Illinois, Indiana and west Kentucky, have you?

A Yes, I have.

Q You are familiar, are you not, with the Government exhibits which relate to concentration trends in both Illinois and the three-state area, are you not?

A The tables that show the share of the top two, [2122] the top four, the top ten, yes, I am.

Q And you are familiar as well, are you, Professor Steiner, with the tables prepared by Dr. Bruce Netschert and his report which is in evidence?

A Yes, I am.

Q And you have read the deposition of Dr. Netschert, have you?

A Yes.

Q And the deposition and report of Dr. Gerber?

A Yes.

Q Looking directly at the Government exhibits which I have mentioned, they indicate that in the period of 1957 to 1967, and I don't mean to characterize them as they say what they say, but for the purposes of getting

this discussion going, they indicate that in this period of 1957 to 1967 for Illinois there has been a substantial decline in the number of Illinois coal producers.

[2123] There is other evidence to indicate that in that same period of time there has been a substantial decline in the number of mines, coal mines in Illinois.

Going to the three-state area, the evidence indicates that there has been an increase in the size of the "leading companies" which has also been true for Illinois, and we see particularly from Dr. Netschert's tables that there has nationally been an increase, a dramatic increase in the size of mines.

I want to now ask you, first, what are the possible explanations for the decline that we have seen in the coal industry in the number of companies, the number of mines and the increased size of the surviving companies, if you will, and the surviving mines?

A I think you said at the—

MR. CUSACK: Your Honor, may I pose an objection here for the record?

THE COURT: You may.

MR. CUSACK: The Supreme Court of the United States in the case of United States against Pabst Brewing Company, handed down in June of 1966, stated very clearly that the cause of concentration and attrition [2124] and cause for mergers, whatever cause, that the key thing was whether or not there was a trend of concentration and attrition in the industry regardless of the cause; and on this basis I object to this line of questioning.

THE COURT: He may answer subject to the objection. The objection may be noted.

MR. CUSACK: Thank you, your Honor.

BY MR. HEDLUND:

Q Do you have the question, Professor Steiner?

A Yes. I think in the first part of your question you spoke of the decline of the coal industry. I am not sure the record does show that. You are talking—

THE COURT: Speaking of the terms in decline of numbers.

BY THE WITNESS:

A (Continuing.) If I understand the question, you are asking me are there various possible explanations that one might advance before one looks at the facts; and I am always suspicious of people who say there are three possible reasons for something because there may easily be more, but let me suggest at least three different kinds of explanations that might, before one [2125] looks at the facts, be offered.

One is changes in industry structure of a magnitude of a really dramatic nature of what we have observed here in a relatively short time which might be due to changes in conditions of demand for the product in question and dramatic changes in demand often require, compel and thus, if the industry is responsive, lead to a series of adaptations which lead to changes in the structural characteristics of the market. There are historical examples of that.

[2126] A second kind of explanation might come from the supply side, the technological side. You may have a major innovation, a major set of new techniques or new products that indeed so restructure the industry producing these and, indeed, a series of industries that they in turn supply, that they may induce structural changes in one or more instances.

Third, is the kind of explanation which perhaps Mr. Cusack was urging on us a moment ago. The third explanation would not put primary weight on either an autonomous shift in demand that led to these changes, nor a change in the supply conditions that led to them but, rather, that it was due to the behavior of existing firms who perhaps, by virtue of a series of mergers, decreased the number of sellers, and it was thus an internal behavioral response here not well explained by outside forces affecting either demand or supply.

MR. CUSACK: Your Honor, in regard to Professor Steiner's comment on my previous objection, I would like to point out that I was not referring to Mr. Cusack's ideas on this question. I was referring to the Supreme Court's idea which is very clear and set out in the Pabst case.

THE COURT: All right. That may be noted.
[2127] MR. CUSACK: Thank you, your Honor.
THE COURT: Proceed.

BY MR. HEDLUND:

Q Based on the record in this case, of the three possible explanations that you have suggested for the decline in the number of companies, the number of mines and the increased size of those surviving, which of these explanations do you feel best explains the reasons for what has happened?

A I think the record seems overwhelmingly clear to me that we have here a demand-induced set of structural changes, changes in the nature of demands for coal both in terms of the decline of the railroad market to virtually nothing, the disappearance or the virtual disappearance or the near disappearance of the home heating market, to the tendency for increasing substitution of gas for coal in the industrial market, but at the same time the substantial rise in the demand by the electrical utilities for coal has itself been sufficient to explain everything that has occurred.

I think that there are really two phenomena, not one, in the question you asked me. One is the disappearance of a very large number of substantially small producers. [2128] The other is a growth in size, in mine size and, to some extent, in company size of the quite large producers.

I think those are not the same phenomena, but I think they are both related to these demand conditions. I would not say there have not been technological innovations, cost changes, supply changes.

There have been. There have been in the techniques of mining, as the productivity increases in both the efficiency of the production of coal and its distribution, but those seem to me, too, to be responses to following on the kind of changes in the demands for coal that have made it possible for coal producers to produce in larger quantities for a rather different market.

Therefore, there have been mergers in this industry and some of those require explanation outside of this

framework, but it seems to me the basic statistics, the dominant statistical picture is one that can be readily understood in changes of the terms of the changes of demand and cannot be understood without taking into account the changes in demand.

THE COURT: Would this be a good opportunity to take a recess?

[2129] MR. HEDLUND: Yes, your Honor.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

[2130] THE CLERK: The case on trial.

THE COURT: Are you ready to proceed?

MR. HEDLUND: Yes, we are.

THE COURT: You may proceed.

BY MR. HEDLUND:

Q I gather then, Professor Steiner, that you do not believe that this change, if I might use the shorthand word of structure, has been provoked to any measurable extent by a change in technology, the second possible explanation which you suggest?

A That is right; there have been changes but they have not been the provoking changes, to use your phrase.

Q By way of example, could you refer to another industry in which the change in technology has provoked the change in structure?

A Well, there are a great many examples. I think we are in an important sense today undergoing a series of changes in structure provoked by what can be called the electronic revolution with respect to computers and computerization, automation.

In the automobile industry, the assembly line, which was introduced in the Model T Ford, clearly basically transformed that industry in its day.

[2131] In the textile industry also, I think the synthetics, the chemicals, the introduction of chemical fibers transforms most of the textile industries and much of the market structure in those industries.

Going even further back, there is the impact of the open hearth furnace on steel production and so on.

It seems to me our history is replete with examples of where a major innovation or a series of smaller innovations have gotten to the point where they have simply generated important structural changes. My feeling is that the coal industry has not been subject to that kind of a change over this period. The changes have come from the things I mentioned a few minutes ago.

[2132] Q There have, however, have there not been, Professor Steiner, changes in technology in the coal industry?

A Yes. I think that one of the things that has happened in response to this shift of the market to very largely a market, a demand for coal by electrical utilities, has led to markets that can be supplied by large scale production on unit trains, from large mines, and this has made, in part, necessary and, in part possible, the introduction of machinery that is well suited to large-scale production.

I think there have also been in this industry substantial rises in labor cost and, therefore, a substantial, a very dramatic, as it shows in the data, substitution of capital for labor in the production of coal.

As you see the output per man in coal has at least tripled over the last 20 years and this suggests there has been capital substitution in both the mining and the transportation, the handling of it.

I think these have been very important changes, but they seem to me not to have been the innovating changes that led to the other changes.

Q Returning to the third possible explanation [2133] for this change in structure, I gather that you do not believe that the acquisitions or mergers can be put forth as an explanation for this change?

A Again, if I might come separately to the two questions that I tried to distinguish, I see no evidence whatever in any of these statistics that the disappearance of the small producers is due to merger. We do not have a great deal of data about what has happened to what was 127 companies that reduced to 27, if that is the number, the approximate number of the companies under 300,000 in Illinois between 1947 and 1967, but I find—

Q Did you mean 1947? 1957 and 1967.

A Excuse me. I meant 1957 to 1967, over that 10-year period. I find of those small companies which are not identified, very few of them in terms of the production appearing as mergers in any of the mergers that are listed in the lists that I have seen provided by the Government.

I think there have been mergers. I think, as I have looked at those, particularly in this period since 1957, 1959, and 1960, they do not account for very much of the change in the size in Illinois, at least where I have looked closely, of the large producers except for [2134] Peabody.

Peabody clearly has increased its production and its market share quite dramatically in terms of the series of mergers. I think if one effectuates, if one regards the United-Freeman merger as having been affected for control purposes in 1959, in October of 1959, it seems to me the sensible way to look at it, as an economist, I find very few mergers in Illinois of Illinois producers since 1959, except those that Peabody has engaged in.

I wouldn't say there have been none because I think there probably have been, but I remember very few. It is quite clear that what has happened, leaving the disappearance of the small sellers, is not a major phenomena as far as I can see.

These companies, I believe, were producing 25, 50, up to 100,000 tons of coal. Those companies have found their market disappearing, and many of them seem to just have disappeared.

Whether they have failed or whether they have exhausted their mines and quite quietly disappeared, I don't really know.

The large companies, Peabody aside, seem to have grown largely without merger over this period. In [2135] any case, the basic changes in the phenomenon do not seem to be merger-induced.

May I say one further thing about a purely statistical phenomenon. I think there are two phenomena in terms of growth of size, one of which is real and one is purely statistical.

[2136] We start back in 1957 where we have something over 125, perhaps it is 145 coal companies in Illinois. We then have perhaps 80 or 100 of these companies from the small end disappearing.

If nothing else had changed, that mere disappearance of the small companies would increase the average production of the surviving companies and the average production of the surviving mines.

That is this statistical phenomenon would result from the lopping off, if I may use that phrase, of the smaller companies.

There has been, in addition, a growth in the size, in the production in both the share of the production and the production per company and per mine of the larger companies that I think has been real as distinct from statistical.

I think the data that we have shows that larger mines are being built and thus companies having the same number of mines find their production from those mines in total production increasing. There has additionally, of course, been, and this is particularly evident in statistics on Peabody over this ten-year period, there have been a substantial series of acquisitions of substantial companies which [2137] increased Peabody's market share and thus also the share of the top group of companies if it includes Peabody.

It is there, it seems to me, only there that I find the merger explanation of very persuasive force.

BY MR. HEDLUND:

Q I intend to get back to the specifics of what you have just testified to, but I want to go on to a different subject right now, if I may. With respect to these statistics that have been received in evidence as Government exhibits relating to structure and relating to the production shares of each of these companies, I would like to ask your opinion with respect to whether or not these exhibits show what they purport to show or, to put it another way, are they valid or are they misleading?

A I think in many ways they do not show what I would like to see and, thus, I feel that they are misleading. If they purport to show the relevant measure

of concentration in the proper economic market or the properly defined market, I think they are distinctly misleading for a number of reasons.

Q Would you give me those?

[2138] A I will try to mention some of them. I think for the reasons we can go into this in more detail when you want, but I don't think that Illinois is a proper economic market in the sense in which I would use that word.

I do not think the three-state area of Illinois, Indiana and west Kentucky is a market.

I think that these figures err in lumping, as if they are the same products, metallurgical coal and steam coal. All the evidence I have heard in this case suggests that those kinds of coal are so different in terms of who uses them and their cost and how they are used and the purposes for which they are used, that they should be separated.

I think these figures are misleading if they purport to show the extent of inter-product competition. It seems to me one of the things that one cannot escape in listening to the witnesses in this case, reading the depositions and hearing the body of the testimony is the tremendous importance of inter-fuel competition in the market, at least for the electrical utilities and, indeed, in the market for the others, the loss of the markets to the railroads [2139] and home heating where there is the testimony to the inter-fuel competition over the ten or twenty-year period that most of our data covers.

I think the data may be misleading in that they lump all sales to all buyers without distinctions among them. Yet, it seems to me that quite apart from the metallurgical coal, the electric utility market, if I may speak of it that way, or a group of buyers who probably should be separated and treated separately from other buyers, it seems to me they have different requirements.

[2140] I think in other ways one can keep going on. I think that particularly having heard much of the testimony in this record, I am persuaded that coal is not a homogeneous commodity, even steam coal, that things like sulphur content, things like ash, moisture content,

fusion properties, that these things make it necessary to look, perhaps, with some care to see in which instances, in which cases one has to distinguish.

I think that again, or, next, that it is not clear that where commodities are sold on long-term contracts, where production this year is likely to represent in very large extent production committed on a contract signed some years ago, that production is the proper determination, if you like, of a firm's activity in judging, in evaluating the competition now or the future competition.

It may well be that one has to look at the capability of a producer to enter into another contract.

If, as I believe the record shows, this is a futures market, in the sense that what is transacted is a stream of coal deliveries, it is the potential, and I think the record in this case suggests the actuality of production statistics being misleading unless one pays [2141]attention to available uncommitted reserves.

I don't suppose I have covered all the things that disturb me about those data, but those are at least a few of them.

Let me say one word further. May I?

THE COURT: You may.

BY THE WITNESS:

A (Continuing) I don't by that mean to say that I think that approximate statistics, that this is not a counsel of perfection.

[2142] My criticism of these statistics is not that I think they are less than fully perfect. It is that I think they are less good than they should be.

Many of these things I feel critical about should and can, on the basis of this record, may be looked at and we can find a more refined set of markets, set of product definitions, attention to customers and so on.

BY MR. HEDLUND:

Q We have discussed now really just one dimension or one aspect of the evaluation of the intensity of competition in the market.

I would like now to direct your attention to the second dimension or a second dimension that you mentioned,

which was the performance aspect of the coal industry or coal producers; and I would like to ask you what you feel the record in this case shows as to the degree of competition among coal suppliers, and with particular reference to the electrical utility market in this period of 1957 to 1967.

A I think it has a good deal to say about the effectiveness of competition. I think we see and perhaps the most dramatic statistic of all is one of the ones that I think is in one of Dr. Netschert's tables, which [2143] shows that the price of coal per unit energy, that the energy, that is the cost per million BTU's, I believe that is the figure, has not increased over this 10-year period, that this in a period when most costs have gone up, when wage costs in the coal industry have gone up is clearly testament to the fact that the industry and the competitors in this industry are doing their best to hold that market, the electrical utility market, in the face of having lost some of their other markets.

They have succeeded by one means or another in keeping costs low. I think partly this has been due to a growth in size, the ability to use more efficient techniques, the ability to achieve unit rates on trains.

I believe the statistics do show, in fact, that the coal freight rates, another one of Netschert's tables, suggests that they have actually not only increased less rapidly than other freight rates, but they have actually decreased in the last 10 years, that the cost per ton of coal transported has decreased.

I regard all of those things as the kinds of performance you would expect to see if an industry were fighting very hard to keep its prices low. It is not, of course, enough to try hard. You must succeed and, it seems to me, they have succeeded so they [2144] get in a period, in a decade when industrial prices in general were rising, rising not negligibly, that coal has kept the price of its commodity relatively low.

Perhaps another aspect of the same thing is what you see in the productivity statistics, a sharp increase in the output per man-day worked over this period. This, again, is the kind of response you would expect.

I think, finally, and this comes back to something I said a moment ago, you have seen an industry change and adapt to this dramatic change in the demands placed upon it.

The coal industry, as I remember it, not from any detailed study but from the general impression I had of it 20 years ago, was regarded as a dying industry, an industry faced with the decline of its markets.

It was considered to be a sick industry. The industry has responded to this by finding and, apparently, maintaining and keeping production up, finding alternative ways to use its products.

It has responded to this notwithstanding the loss of those markets, notwithstanding the development of a brand new substitute commodity, nuclear energy being clearly a threat to it.

Gas has become an increasing threat to it. [2145] Notwithstanding the fact in a national sense coal has decreased in the percentage share of the total energy requirements, coal has managed not only to hold a market but to hold its price in that market over that 10-year period quite low.

This is precisely, I think, the kind of a thing you would expect a competitive industry, an industry that was faced with intensive competition to have achieved.

Q In summary, what would you say in terms of the degree or intensity of competition that you have among coal suppliers in this period of 1957 to 1967?

A I think you are asking me there to address myself to, was there evidence in terms of performance that led one to reach an inference about how effective competition had been?

Q That is right.

A And I would say the performance is wholly consistent with and suggests to me that there has been intensive competition among coal producers. That has come, in my view, not only from competition among themselves but from competition with alternative sources of energy.

[2146] With the sources, if you will, that have wiped them out of certain markets and threatened to cut out

their relative share of the electric utility market, but they have held a good portion of that market, I would think, by their success in keeping their price relatively stable.

Q In your opinion is this intensive competition or the level of competition which you have described as intensive in the past decade likely to continue?

A Yes, I think that the decade ahead has somewhat different factors than the decade past.

I think it seems quite clear that while it was the rumble of nuclear energy in the last decade it's going to be the fact of nuclear installations in this decade that is visible.

If I recall those statistics of Netschert having less than 1 percent nuclear capacity in place but the levels of orders and the testimony of Commonwealth Edison, the testimony of TVA, suggests a decade from now that is going to look very different.

I think a second source of pressure on coal producers that will require them to be competitive is this very clear and very pervasive concern with the environment, with air pollution.

[2147] Now, I don't know how that problem is going to be solved, but it is going to be solved by increasing the cost of the use of coal, whether that is by the need to find lower sulphur coals or to utilize those, or the cost of removing sulphur from coals when and if that is feasible, all of these things are going to make it necessary for coal to keep its price as low as it can if it is going to effectively compete, to which I think it will not in my own guess, this is based on the record, and I am not an expert in this, and I think it will not keep pace with the growth in electric power; but whether it can keep its absolute market or even increase it somewhat will depend on the extent to which it is able to keep its price low and to respond to the changes and the demands upon us.

I guess I regard this pollution question as again providing a challenge both to the utility and the coal industry. It's the kind of external change in the demand that again puts pressure on the industry, and I

would think that the industry would be under great pressure to adapt to that, in adapting to it, to find ways of producing cheaply, and this, after all, this competition, this striving to meet these challenges is, I think, what competition is all about.

[2148] Q Are there other challenges aside from—other challenges or pressures aside from the two you mentioned in lieu of competition and environmental competition which you think will be present in the next decade that will have an effect on the intensity of competition to us?

A I think that this was implicit in what I said. I think that the rivalry among themselves of coal producers will continue. I think the pressure on coal producers from the buyers of their product, from the electrical utilities, if you think of that group, these are people who are anxious, I think, to keep the costs of their operations as low as they can.

These are large buyers who put pressure—who put pressure on them—on the railroads, and on others, to try to get coal delivered.

So that I think in this context both the intra-coal rivalry and the fact that coal contracts are bargained for across a bargaining table with large informed, capable buyers, all are additional sources of competitive pressure on the coal producer, on the individual coal producer.

I think, by the way, there will be more casualties. I think there are still a relatively large [2149] number of small coal companies. I wouldn't be at all surprised to see coal companies with production of under 100,000 tons to continue to disappear.

I think, as I say, I think that is a different breed of cat, but they are referring to dogholes, so maybe I think we should change the metaphor.

[2150] Q In that regard, Professor Steiner, do you have with you Government Exhibit 72, which is—I want to develop this point a little further—Government Exhibit 72 which is the Illinois production for 1967, and Government Exhibit 85, which is the production for the three-state area?

Do you have copies with you to give the Court?

MR. CUSACK: Do you have an extra copy, your Honor? It's in Volume 10 of the statistics.

MR. HEDLUND: Volume 10, Tab 11, your Honor, and Tab—

THE WITNESS: I have 72, but not 85, Mr. Hedlund.

MR. HEDLUND: I will give you mine. I will give you my Government Exhibit 85.

THE COURT: What tab number was that, Mr. Cusack?

MR. CUSACK: Tab 11 for the production in Illinois of 1967.

THE COURT: All right.

MR. HEDLUND: And you have a tab number for Government Exhibit 85? I assume that is 24 or 25.

MR. CUSACK: You are referring to 86, aren't you?

MR. HEDLUND: Pardon me.

MR. CUSACK: Production of coal in Illinois and [2151] western Kentucky of '66-'67?

MR. HEDLUND: I am referring to 85.

THE COURT: That is No. 25.

MR. HEDLUND: You have that, your Honor?

THE COURT: Yes.

BY MR. HEDLUND:

Q Professor Steiner, looking at Government Exhibit 72 and 85, I am going to ask if you could relate in these statistics in terms of the size of the companies, and having in mind the histories of the companies shown here, the extent to which you can relate this to the, if I may use the term, intramural pressures or challenges among coal suppliers?

A I wonder if I might have that question read back?

THE COURT: Read the question.

(Question read by reporter.)

BY MR. HEDLUND:

Q And whether those pressures are going to continue?

A Well, I think one of the things that, if I may look at the Illinois figures, that there are—if we look at the eight leading suppliers—that will be to Ayrshire—we have eight producers—substantial [2152] producers

in terms of tonnage, and if I look back to 1957, I find those eight producers also with substantial shares.

I think one of the things that—if one looks at the group and I don't know if this is what you had in mind, Mr. Hedlund—but if you look at the group from the third to the eighth of these companies, they are all substantially sized, clearly of a size that is capable, if they have reserves to back up this level of production, capable of continuing to operate in a utility market.

They have not—if I remember the statistics year by year—not found themselves losing ground over this 10-year period—that is the contrast between these large companies in this decade and the much smaller companies, the remaining companies as they are here called, has been very different.

These companies appear to have a size that has made them at the beginning of this period significant factors in that market—at the end of the period significant factors in that market—and I know of nothing in the record that suggests that situation will change.

I see no tendency, for example, in Illinois for companies with production in the neighbor- [2153] hood of two, three, four, five and six million tons no longer be strong competitors. I will put that positively. The evidence, as I see it, is that those companies are in a position to compete in this market.

Q This would, of course, would it not, Professor Steiner, depend upon the reserve base of these eight companies?

A Well, that's right. I said, and with one of the troubles with looking too long at these statistics is that they show what they show and they fail to show certain other things.

If we assume these companies have reserves—what I am saying here, I think, is, and perhaps you are saying the same thing—is in order to be an important competitor in this market one clearly needs both; production capability and the coal to produce, and thus both production capability and reserve capability are important.

I was addressing myself to the fact that while the small companies, the remaining companies which have

been disappearing and which I would expect would continue to disappear, do not seem to me to lack the production capability to deal in this market.

[2154] This other group of companies do have that capacity, and I think you see much the same thing in the three-state area table, but you have, in that case, I think, ten companies over 2 million tons, and they all look to me in the sense in which the record discloses any thing at all about what is required for viability, and I think it discloses a good deal, they all look to me to be viable competitors.

[2155] Q I would like now to go back to the subject that you mentioned, and that is the definition of the markets that have been adopted by the Government in this case.

As you know, their statistics and their contention holds that there are two relevant markets, one the State of Illinois, and the second what has become—has come to be called the Eastern Interior Coal Province sales area, which I will not even attempt to describe, but which involves some seven or eight states or portions thereof.

I believe you have testified that you are not satisfied that either of those markets were in fact economically realistic, and I would like to ask you why you feel that way?

A I think I haven't so stated with respect to the Eastern Interior Coal Province sales area but I do, I now so do.

I think the reasons are different for the two although they are part of the same basic argument. I think neither one of those two designations corresponds to the kind of homogeneous set of transactions that it makes sense to look at separately, as a whole, and to exclude other transactions.

[2156] If I might take, first, the notion of the Illinois market. I think if one looks, for example, at some group of producers—and I am now just glancing and looking at the producers in the Belleville area—having looked at their statistics with respect to where they ship their coal, I find that their customers tend to occur in several

states; that indeed if I were defining their market area, it would be defined more by the Mississippi River Valley than either the State of Illinois or a group of other states.

MR. CUSACK: Excuse me, Professor, your Honor, may I say something? May I please have a continuing objection on the record, your Honor, on testimony in regard to the relevant geographic market in the light of U. S. v. Pabst Brewing Company, 384 U.S.

THE COURT: You may have a continuing objection on that subject.

MR. CUSACK: Thank you very much.

BY THE WITNESS:

A I was talking about why I was unhappy with the Illinois market.

One reason I am unhappy is, I think a great deal of the coal that is produced in particular regions of Illinois is not in fact shipped either [2157] uniformly throughout the State of Illinois, nor indeed so limited.

To use perhaps one example, using that Belleville area. We can look at others, if you want.

The second from the point of view of customers, if I turn the thing around, if I take a group of, let us say, utilities located in a portion of Illinois, it is not true either that they buy all of their coal from Illinois or that they buy entirely throughout the state. They may, indeed, have much more narrowly defined areas.

I think that for both of those reasons, and the fact as I said earlier, that I believe one can do better on the basis of the data collected either by the Government or by the defendants, we can get a better approximation of the markets, we shouldn't use that.

I find, secondly, the notion of the Eastern Interior Coal Province sales area genuinely baffling. I spent a good deal of time trying to figure out the criteria by which the Government defined that particular area. It is perfectly clear that there are customers outside of the area who receive substantial [2158] amounts of coal produced within the State of Illinois, for example. This is true of that area that is excluded in the State of

Wisconsin, up north of Milwaukee, up toward Green Bay, Sheboygan, Manitowoc, and so on.

I also find substantial amounts of production by producers within that area that goes outside to other areas and at the same time areas within the sales area that receive none of this coal.

Looking at the Bureau of Mines statistics, for example, I looked at west Kentucky producers who are within that area. They ship virtually no coal, some I think, but virtually none to eastern Iowa or eastern Missouri. They ship a great deal of coal to Mississippi and Alabama. I do not know the logic by which that area is defined.

By the same token, there are areas within that, there are areas within some senses are much too narrow. Are you saying this is every place that coal goes that is produced within the area? The answer to that is no.

On the other hand, it's much too narrow—excuse me—much too broad in the sense that there are clearly large areas within that market that [2159] do not receive coal from other regions within it.

I think virtually none of the coal that I know of that is produced in southern Illinois; Belleville, Springfield, Fulton, Peoria, goes to Indiana, for example. Very little of the Indiana coal comes to Illinois. It does not then have the kinds of cohesiveness of a group of transactions that seems to me to make it necessary for—sensible to treat it as an economic market.

But I have, really, have the basic trouble perhaps this will be cleared up on cross examination, I do not understand how the Eastern Interior Coal Province sales area was drawn and not understanding that I cannot discuss the logic of its being drawn in that way. It seems to me not to be in accord to the facts, as I read them.

[2160] Q In summary then, if there is no such thing in terms of economics or economic analysis of an Illinois coal market, and if there is no such thing again in terms of economic analysis as the Eastern Interior Coal Province sales area, how does this affect the validity or the meaningfulness of the production shares of companies produc-

ing coal in Illinois or production shares of companies producing coal in the three-State area?

A Well, as I think I testified earlier, I do not believe production shares, market shares, concentration ratios make sense at all, or have any genuine indication of the degree of competition unless they are measured in a meaningful economic market. I think that without a market one does not have the basis of using these statistics. Within a market one has certain problems in using market shares, but I think that those are so greatly intensified when one has, one does not feel it's a sensible market because it's too broad or because it's too narrow.

I don't believe you just draw circles on a map and say that is a market. I think you can do that, but I think you lose economic insight when you define markets in that way, and you lose insight, the insight, [2161] that concentration ratios give when you define them in that way.

MR. HEDLUND: Your Honor, I am about to go into a new and rather lengthy area. Would you like to adjourn?

THE COURT: Why not go for another 10 minutes because we have a deadline that is coming up.

May I inquire how much more do you anticipate that you will take?

MR. HEDLUND: Your Honor, I would think I would have about another hour with this witness.

THE COURT: Another hour?

MR. HEDLUND: Another hour.

THE COURT: So we put it in the right posture, if we take that recess, can you proceed much more effectively or use the 10 minutes to advantage?

Do you have a comment?

MR. CUSACK: My comment was, as told by Mr. Hedlund at the last break, he would go all day with Professor Steiner. You do think you will finish in an hour?

MR. HEDLUND: Yes. I think I will finish in an hour.

* * * *

[2171] THE COURT: You are entitled to your interpretation, certainly, and I think it was not made a part of the record here. Mr. Bane should be here so he would have that opportunity. That is the only thing I have to say.

As far as the Court is concerned, if it all [2172] has to go on the record, it goes on the record. I indicate and I will make a ruling as to whether I think the offer of proof made here is an essential part of it.

The only question I had was whether or not the preliminary remarks—Mr. Cusack, I am well acquainted with the rule he cited here, and all I thought was that there was an understanding between counsel, and I look at it as officers of the court, and I say there is nothing in there to indicate that, but we have to live together and we have to work together, and I say to take that element of it in mind and, certainly, Mr. Bane should be considered on it.

We will put it over to 10:30 tomorrow morning which will be about the time we get started. All right, thank you.

Are you ready to call your witness, Mr. Cusack?

MR. CUSACK: Yes, your Honor.

MR. EISEN: I am sorry, your Honor. I didn't know we agreed to put this man on the first thing. Otherwise, he would have been here.

THE COURT: All right.

ROBERT H. QUIG,

called in rebuttal by the plaintiff herein, having been first duly sworn, was examined and testified as follows:

[2173] DIRECT EXAMINATION

BY MR. BRAUN:

Q Would you please state your name for the record?

A My name is Robert H. Quig, Q-u-i-g.

Q What is your address, Mr. Quig?

A My business address is 320 Park Avenue, New York, New York.

Q By whom are you employed?
A I am employed by Chemical Construction Corporation.
Q Is that firm sometimes known by the name Chemico?
A Yes, it is.
Q How long have you been employed by Chemico?
A I have been employed by Chemico for three and a half years?
Q Could you briefly describe for us your experience in the field of air pollution.
A Yes, for the past three and a half years I have been employed by Chemico with the title of engineer, utility operations; and in that time I have been in charge of the management, control and development of pollution, the development of pollution control [2174] systems for use on power plants and other stationary sources to control various discharges of pollutants.
[2175] Q And for how many years, if you know, has CHEMICO been engaged in the study and research on pollution?
A CHEMICO's corporate business has been for over 50 years in the chemical process industries and for approximately 25 years in the construction of pollution control systems.
Q Could you briefly describe your educational background and the extent to which you have received any degrees.
A I am a graduate mechanical engineer from college, Lafayette College, and I am a registered professional engineer.
I have a graduate degree in Business Administration.
Q Does CHEMICO have a commercially feasible process for the removal and disposal of sulphur dioxide gases which are created by the generation of electric power?
A CHEMICO—yes, CHEMICO has a process to offer for the removal and disposal of stack gases from power plants.
Q Could you explain this process and how it works.
[2176] A Yes. We would approach a pollution problem on a power plant for a disposal effort in that we

would build a scrubber system whereby the flue gases discharging from the boiler of the power plant would be diverted into the scrubber, and at that time absorption of the SO_2 would be done by the addition of alkali such as calcium oxide, and this calcium oxide can be obtained from various sources, limestones and limes in a regional area.

In the scrubber the calcium oxide reacts with the sulphur dioxide forming calcium sulphide and sulphate which, in turn, is discharged to a disposal area similar to the removal of fly ash or bottom ash from the boiler.

Q And is this process one which, in your professional judgment, could be installed on an electrical utility generating station commencing tomorrow?

A Yes, it can.

Q Does CHEMICO also have a process for the removal and recovery of sulphur dioxide stack gases?

A Yes, we have a process.

Q Would you explain how this process operates?

A Essentially using the same scrubber arrangement on the power plant we would add, instead of calcium oxides, a better absorbent material, and in this particular case with CHEMICO it is magnesium oxide.

[2177] The magnesium sulphide and some sulphate that is formed is withdrawn from the scrubber system as a dried material, and then it is transported away from the power plant where it is converted through processing techniques to release the SO_2 again, this time under a controlled environment basis.

The SO_2 can then be converted directly to sulphuric acid or through the utilization of reduction techniques, elemental sulphur can be recovered.

The magnesium oxide is regenerated and recycled back to the power plant for reuse in the scrubber system.

Q Do you have an estimate of the costs of installing your system which could be based on cost per million British thermal units?

A Which system are you referring to?

[2178] Q Do you have an estimate of the cost with respect to your disposal system based upon whatever the cost would be per million BTU's?

A Estimates of investment and operating costs are determined by several inputs, and it is hard to give a specific example.

As a general across-the-board estimate, though, we look at, say for example, a 600 megawatt power plant having an investment burden of seven to ten dollars per kilowatt, and the disposal costs, along with the capitalization costs and other utility and overhead maintenance costs, it is conceivable you can have a total operating cost of approximately a dollar per ton of coal which is three to four cents per million BTU's fired.

Q Could you similarly describe the estimated costs on your process for the removal and recovery of sulphur dioxide gases?

A The recovery process for the utility power plant site would have the same scope of investment costs. The recovery investment and operating costs we concede to be that of others, and the reason that one would go to a recovery effort is to avoid the disposal problems associated with a calcium-based scrubbing system.

[2179] Q In your professional judgment, would adding the costs of your pollution control equipment to a new coal-fired generating unit be more or less expensive than the cost of building a similar sized nuclear generating station?

MR. HAUBOLD: Your Honor, I object unless counsel lays a foundation as to this witness possessing knowledge of the nuclear industry.

THE COURT: Lay the foundation.

BY MR. BRAUN:

Q Mr. Quig, have you or any of the companies with which you are associated, manufactured or designed nuclear power plants?

A My company, Chemical Construction Corporation, does not build nuclear power plants, but in our discourse on the whole problem of environment, we have been led to believe from the many utilities and engineer organizations which we deal with that we under most conditions could build a SO_2 removal system that would be cheaper than a nuclear unit at this time.

MR. HAUBOLD: Your Honor, I object to the testimony of the witness to the extent that he has been led to believe certain facts, and I move that it be stricken as unresponsive.

[2180] THE COURT: Do you have any comment?

MR. BRAUN: He has testified that he has been led to believe that by engineering studies as well as by what would otherwise be hearsay.

THE COURT: The latter part would be stricken because it shows he has no direct acquaintance with it, that he is led to believe. There is no basis for cross examination.

MR. BRAUN: May I approach the witness?

THE COURT: You certainly may.

MR. BRAUN: I will ask the Court Reporter to mark, for identification, a Chemico brochure entitled "Removal and Recovery by the Central Process Concept" as Government Exhibit 312.

(The above-described document was thereupon marked as Government Exhibit 312 for identification.)

MR. BRAUN: May I approach the bench, your Honor?

THE COURT: You may.

* * * *

[2185] THE COURT: Well, let me state that I will admit it subject to a motion to strike if it is shown on cross examination that there is not the proper foundation for the underlying documents which is incorporated in and made a part of this speech.

MR. BRAUN: Thank you, your Honor. I have no further questions.

(Whereupon, the document previously marked as Government Exhibit 313 was received in evidence, subject to a motion to strike.)

THE COURT: All right, are you ready to cross examine?

MR. HAUBOLD: Yes, your Honor.

THE COURT: All right, you may proceed.

CROSS EXAMINATION

BY MR. HAUBOLD:

Q Mr. Quig, is it not a fact that Chemico has never operated any of its SO_2 removal or recovery processes continuously in any integrated large scale power plant?

A That is correct.

• • • •

[2191] Q Now, Chemico is currently—strike that.

Is it not a fact that Chemico, as yet, does not have a contract or firm commitment to build or construct a prototype sulphur recovery unit?

A We do not have a contract.

Q Chemico is presently attempting to secure some financing from the Federal Government to further its development of the recovery process, is it not?

A That's correct.

Q And is it a fair statement that Chemico has no present intent to finance a prototype model of the sulphur recovery process, assuming that the Federal Government is not willing to put funds into it?

A We are engineers and constructors, not investors, so we would build these systems. I doubt at the moment whether or not we would pay for the total cost of a large prototype ourselves, yes.

Q Assuming that funding is forthcoming, at some future time, for a prototype operation, would not the construction of a prototype sulphur recovery system require from 2 to 2 and 1/2 years?

A Yes, that is a fair estimate of the time.

• • • •

[2197] Q Well, are you refusing to answer on the basis that you are not able to make such a statement?

[2198] A I think on giving so-called testimony on nuclear unit operating costs, I don't think I would be an expert witness, in my opinion.

MR. HAUBOLD: Just one moment, your Honor. Just one final question.

THE COURT: All right.

BY MR. HAUBOLD:

Q I am reading from page 14 of Government Exhibit 313, and ask you if this is your opinion:

"Contact over the past two years with utility management has made us think that it would be wrong judgment by fuel suppliers to expect the utility to finance and resolve the total SO_x problem alone. If the utilities are left to develop their own response in achieving ambient air, they may very well trend towards the use of substitute fuels."

Is that your opinion, Mr. Quig?

A Yes.

MR. HAUBOLD: I have no further questions.

THE COURT: Any redirect?

MR. BRAUN: Yes, your Honor.

[2199] THE COURT: All right. You may proceed.

REDIRECT EXAMINATION

BY MR. BRAUN:

Q Mr. Quig, when Mr. Haubold asked you a moment ago whether you believe utilities were willing to finance the recovery process alone, were you referring to the third state of your recovery process as opposed to the removal of sulphur dioxide from stack gases?

A Well, I believe that the utilities would prefer to be removed from financing Chemico's recovery process operations. Whether or not they finance it or not has to be weighed in with their total viewpoint on how they are going to approach their air pollution problems.

Q Have you had over the last several years conversations with utility personnel who are interested in the Chemico process?

A Yes, we have.

Q And have a number of these utilities expended or indicated to you their willingness to expend 2.5 million to build a prototype unit?

MR. HAUBOLD: I object, your Honor, on hearsay. Counsel is asking the witness to speculate as to what the intent of these various other parties are.

THE COURT: Well, he said had they indicated their [2200] willingness.

You may answer.

BY THE WITNESS:

A Yes, we have utilities who have indicated to us their willingness to invest into a prototype SO_2 recovery operation.

BY MR. BRAUN:

Q And what amount of money have they indicated in their willingness to invest?

A It would range, depending on the scope of the work, in the range of 2.1 to 2.5 million dollars.

Q Mr. Haubold asked you earlier about the various load factors of generating stations. Were these factors taken into account in your consideration of the costs of utilizing the Chemico process?

A Yes. The purpose of recovery concept is to avoid the problem of power plant load factor.

Q Now, you indicated on direct that you agreed with the statement that recovery of sulphur would be elusive. Are you prepared to build your disposal unit into a generating station at the present time?

A Yes, we are prepared to bid on that type of a system.

Q Do you believe that your recovery system will [2201] be commercially feasible and operable, based on your professional judgment within the next five years?

A I am sorry, you said recovery?

Q Yes, your recovery system.

A Yes, we believe that.

MR. BRAUN: I have no further questions, your Honor.

THE COURT: Any recross?

MR. HAUBOLD: No recross, your Honor.

THE COURT: All right. Thank you, sir. You are excused.

THE WITNESS: Thank you.

(Witness excused.)

MR. EISEN: Your Honor, I just was going to make a statement and I know the Court admonished us not to quibble about documents. I didn't want to raise it before, but maybe I am quibbling now. Neither one of these gentlemen had these documents before the witness came to town, neither side. I just want the Court to know that.

MR. HEDLUND: I don't want to quibble, but let's get the record straight that this is a Government witness and a man identified him some three weeks ago, and I don't think it excuses them, but I don't want to take the Court's time, but I think the record should be clear.

THE COURT: The documents are in, let's not quibble.

• • • •

[2203] THE CLERK: Case on trial.

THE COURT: Are you ready to proceed?

MR. HEDLUND: We are, your Honor.

THE COURT: Will the witness take the stand.

PETER O. STEINER,

called as a witness by the defendants having been previously duly sworn, resumed the stand and was examined and testified further as follows:

DIRECT EXAMINATION

(continued)

BY MR. HEDLUND:

Q Professor Steiner, as part of your time or responsibility in connection with this litigation, did you yourself or have any of your colleagues attempt to prepare a statistical analysis looking toward the identification of economic, realistically economic markets within the Midwest?

A No, I did not.

Q Did you give defense counsel any suggestions along those lines?

A Yes, I did, a great many.

Q Could you tell me, sir, exactly what you suggested might be done in that respect?

A What I suggested after reading some of the [2204] depositions and hearing some of the testimony, was that it sounded to me as if it would be possible to find identified groups of purchasers who were purchasing coal from identified groups of suppliers, and that there would be perhaps also a situation in which those same customers were among the major group of customers of that same set of suppliers.

I think I am not being entirely clear, but it is suggested to me there might be buyer-seller constellations which could account for a large percentage of the coal consumption of the buyers and, at the same time, a large percentage of the coal sales of the selling groups.

I urged that we look on the basis of the evidence I knew was being collected, that we look and try and identify such groups of buyers and sellers who might appear to be closely related to one another in an economic market.

Q Let me ask you before going into detail, if it were possible to collect such constellations, what, in your opinion, would that indicate?

A Well, if I found a group of customers, let's say, who were buying 80 percent or 90 percent of their coal from one group of buyers, from one group of [2205] sellers, and at the same time those sellers were located in an area and were providing 80 percent or 90 percent of their output to those groups of customers, it would suggest very strongly that there was a strong set of economic factors that linked those buyers with those sellers, and it would make sense to take that group of transactions and treat them as if they were a sensible grouping for economic analysis.

It would be precisely the sort of relevant collection of transactions to treat as a unified whole rather than separately.

[2206] Q Do you have with you, Professor Steiner, what has been received in evidence as Defendants' Exhibit No. 55?

A Yes, I do.

MR. HEDLUND: So that the record is clear, this consists of a series of tables designated as D-1-F to D-3-F, D-1-S to D-3-S, D-1-B to D-3-B, D-1-SO to D-3-SO, D-P and D-X.

BY MR. HEDLUND:

Q Have you made yourself familiar with the contents of this exhibit?

A Yes, I have.

Q By way of example, and without going through the entire document, I would like to direct your attention to Tables D-1-F, D-2-F and D-3-F, and I would ask you to explain what you believe those tables show and what the purport of the information is demonstrated thereon.

A Well, I believe these three tables show that it is possible to define a sales area surrounding the Fulton-Peoria freight rate district, that quite accurately defines a market for Fulton-Peoria coal, the market in the dual sense that I described a minute ago.

Not only did most of the coal go to an iden- [2207] tified group of customers, but those customers also relied very heavily on the Fulton-Peoria producers to supply their needs. The tables are divided as between utility customers and non-utility customers; and the first page relates to the utility facilities utilizing this coal; the second page to non-utility facilities. The third page is a combined summary.

I should say that in analyzing these data, and particularly important with respect to this example, is that it seemed to me and also I think to defense counsel appropriate for reasons we can go into later, if you like, to consider Commonwealth Edison as a separate buying market and to treat it separately for reasons, as I say, that we can go into.

Do you want me then to discuss briefly what I think the table shows?

Q If you would.

A If one looks at the first page of Table D-1-F, we have identified three companies with a variety of facilities there in the Fulton-Peoria sales area which,

if one looks, and this is shown under No. 2 on the first page of this table, that these facilities, when one looks at their total consumption of coal, 87 percent of the consumption of coal of that group of utility facilities [2208] comes from producers in the Fulton-Peoria district.

13 percent comes from producers in other districts as is shown, 13 percent; 12 percent from Belleville and 1 percent from Mineral Atkinson.

It is true for this group of companies they consume a substantial fraction of their coal from a single producing area and virtually all the rest of it from a second area.

Turning it around under No. 3, we see the Fulton-Peoria producers sell all of their coal that goes to utilities in either this consuming area or to Commonwealth Edison.

It is, I think, these particular customers then account—these three utilities plus Commonwealth Edison account for all the utility coal produced in the Fulton-Peoria district and, at the same time, the Fulton-Peoria district accounts for 87 percent of the coal consumed by customers in that area.

Moreover, these customers are geographically related to one another in a definable way. They all have plants along the Illinois River and thus this seems to define both in customer and seller relationships a geographic market area that is determined very largely by this river coal, this barge coal, which much of the [2209] Fulton-Peoria coal is, and that seems to account for it and it seems that Fulton-Peoria utility coal, insofar as it goes to the utility market, is very much less than the state-wide market in a sense.

[2210] The second page attempts in a similar way to treat the non-utility facilities that consume Fulton-Peoria coal and analyze them in much the same way.

No. 1 on page—on table D-2f identifies the specific installations, the number.

The No. 2 on the second page of this exhibit shows that this group of customers are getting 85 percent of their coal requirements supplied to them by Fulton-Peoria producers, and flipping the page, on the third

page, which is table D-2f continued, you see that these utilities—excuse me, these customers defined get 70 percent of the non-utility coal produced by producers in the Fulton-Peoria district. 24 percent is sold to customers in the Chicago air quality control area, a region we have also segregated for what I think are valid reasons, I suspect you will want to go into later, thus leaving out those sales. If one leaves out the Chicago market, 70 out of the 76 percent out of that table goes to this group of buyers.

They, thus, are principal customers of the Fulton-Peoria producers and turning it around, those customers get most of this coal from the Fulton-Peoria [2211] district.

Page D-3f combines them, the utility and the non-utility market, and that shows in summary fashion under No. 1 that taking this group of customers as a whole, of their total coal consumption 86 percent of it comes from the Fulton-Peoria area, 14 percent as there described comes from other areas.

Looked at from the point of view of the producers, 46 percent comes to the identified facilities in that area. Another 45 percent to Commonwealth Edison, which, of course, also is very largely river stations in that area, and another 7 percent is the Chicago air quality control region, thus accounting for the great bulk of the production and thus in this sense, it seems to be an economically sensible matching of a group of customers with a group of producers.

Q There are similar tables, are there not, in Defendants' Exhibit 55 relating to sales and consumption of coal produced in the Springfield Freight Rate District and in the southern or in the Belleville Freight Rate District and in the Southern Illinois Freight Rate District?

A Yes, there are. The next three sections of [2212] this table take the other three districts in which defendants have mines and make similar analyses for each such district.

Q If we were to go through each of those three, I gather your explanation of this would be the same?

A Their structures are precisely the same. The areas are different. The identities of the customers are different, of course.

MR. HEDLUND: In an attempt, your Honor, to make this a little more understandable, we have prepared but will not offer into evidence a map of the general area in which we have been dealing. The cross-hatched on this map represents the Federal air quality control region which is defined in the Code of Federal Regulations as the counties surrounding Cook County and, of course, Cook County itself.

We have also indicated but with only rough geographic proximation, the facilities, generating facilities, coal generating facilities of Commonwealth Edison which are basically Chicago, which include the river stations, Joliet, over in Hammond and Rockford and Dixon and Pekin and Kincaid and up in Waukegan.

I would like Mr. Kempf, if you will, to place on that map the overlay depicting roughly— [2213] well, the overlay with respect to the Fulton-Peoria utilities sales area.

MR. CUSACK: May I look, your Honor? It is the first time I have seen this.

THE COURT: You certainly may.

[2214] BY MR. HEDLUND:

Q Can you see that, Professor Steiner?

A Yes, I can.

Q Does that correspond to what you believe to be a rough geographical representation of the facilities located, that is the generating, utility generating facilities located in the Fulton-Peoria sales area?

A That band, which I remember, goes down the Illinois River and is somewhat wider, of course, than the river itself, but I think that picks up these stations that we identified here as the utility facilities located in the Fulton-Peoria sales area, yes.

MR. HEDLUND: Mr. Kempf, would you remove that and place on the overlay, the Fulton-Peoria non-utility sales area?

BY MR. HEDLUND:

Q Professor Steiner, does this correspond with your understanding of the geographical representation of the facilities in the Fulton-Peoria non-utility sales area?

A Yes. I do not vouch for the exact accuracy of the lines, but stretching in that case west and north from the Illinois River is the area in which each of these facilities that were identified on Table D-2-F is located.

[2215] MR. HEDLUND: Mr. Kempf, would you remove that, please, and put on the overlay with respect to the Belleville utility sales area.

BY MR. HEDLUND:

Q Having done so, now, Professor Steiner, does this overlay correspond to your understanding of the geographical location of the utilities in the Belleville utility sales area?

A Yes, these are the utilities identified by name on Table D-1-B.

They fall in two groups. There are those in the St. Louis area, and the facilities in the St. Louis metropolitan area, and then the Mississippi River stations in Illinois, Iowa, Wisconsin and Minnesota.

MR. HEDLUND: May we have the Belleville non-utility sales area, please.

BY MR. HEDLUND:

Q Again, Professor Steiner, does this overlay correspond to your understanding of the geographical location of the facilities in the Belleville non-utility sales area?

A Yes, the facilities listed in Table D-2-B all fall or at least approximately fall within that area around and south of St. Louis.

[2216] MR. HEDLUND: May we have the Springfield area, please.

MR. CUSACK: I think you should point out for the record that is with the exception of the coal sold to the Greater Chicago Air Quality Control Region.

MR. HEDLUND: Yes, as we define it. That is understood throughout.

THE WITNESS: My understanding is we are excluding the sales to Commonwealth Edison and to the Chicago Air Quality Control Region in every case, your Honor.

THE COURT: That conforms with your understanding?

MR. CUSACK: Yes, your Honor. I just wanted to make it clear.

THE COURT: Yes.

BY MR. HEDLUND:

Q You have now placed on the map the overlay for the Springfield utility sales area, and does this correspond with your understanding of the geographical location of the utilities in that sales area?

[2217] A Yes, it does. These are on table D-1s of the exhibit. They are in that rather narrow band around Springfield itself.

MR. HEDLUND: May we have the overlay for the Springfield non-utility sales area.

BY MR. HEDLUND:

Q Again does this overlay correspond to your understanding of the approximate geographical locations of the non-utilities in the Springfield sales area?

A Yes, it does, a slightly largely perimeter but in the same general area as the utility sales area.

MR. HEDLUND: And the overlay for the Southern utilities, please.

BY MR. HEDLUND:

Q Again, Professor Steiner, does this correspond to your understanding of the approximate geographical location of utilities in the southern utility sales area?

A Yes, it does. This divides into three distinct groups. The group in the northeast of Wisconsin—by the way, some of that is outside—this goes, a good bit of it, to places like Green Bay and Sheboygan, and so forth, and I believe that goes to Chicago by rail and rail to ship and then to the lake [2218] ports.

The second large area west of the Mississippi is, I think, rail coal from the Southern Illinois Freight Dis-

trict, and then there is some in the southern portion of Illinois that is again distinct.

It is possible to identify these clusters of customers for which there was this reciprocal type of relationship.

MR. HEDLUND: And, finally, may we have the overlay for the southern non-utility sales area.

BY MR. HEDLUND:

Q Again, does this correspond to your understanding of the geographical location of the non-utility facilities in the southern sales area?

A Yes, it does, and these areas are very similar, somewhat broader, again, than they—they are the same three basic areas as up here on the utility sales area for Southern Illinois Freight Rate District producers.

Q Now, while I ask Mr. Kempf to replace all of the overlays, I would like to ask you two questions. In the analysis that we have just looked at contained in Defendants' Exhibit 55, do you believe that it was valid or meaningful to separate or hold apart the [2219] shipments with respect to Commonwealth Edison?

A Yes, I do.

Q Would you explain why?

A The dominant reason, but it is only one of two major reasons, is the quantity of coal purchased by Commonwealth Edison for its stations which are shown by the black dots, although there are more stations than there are dots.

If I remember the testimony and the record in this case, Commonwealth Edison purchases between 17 and 19 million tons of coal a year, approximately a quarter of the total coal produced in the State of Illinois. It purchases more than it could purchase from any single district and, thus, its purchases are necessarily spread throughout several, though I think not all, producing districts, if I remember Mr. Corey's testimony.

For that reason, because simply the volume of its purchases and the fact that it of necessity was purchasing in many areas simultaneously, and because it was such a large purchaser, it seemed best to recognize it as an important purchaser but, nevertheless, to treat it separately.

Without it we would have failed to see, [2220] I think, the clear pattern that affects the rest of the purchase of utility and non-utility purchases alike.

The second reason which perhaps justified treating it separately, and even if the other had not been present, is the fact that it is in particular—it appears to be in particular concern of the air pollution regulations in and around the Chicago area, and because it has already made such a heavy commitment to nuclear and to the substitution in a substantial sense of nuclear for coal, particularly in this case for the relatively high sulphur Illinois coal that it has been buying in large quantities, it seems for that reason as well that if we deal with the Commonwealth Edison purchases of coal, it is well to keep them separate to recognize this as a distinct problem as an identifiable sub-market that is worth looking at as a sub-market.

[2221] Q In your opinion, is it valid or was it valid and meaningful to separate the shipments into the Chicago Air Quality Control Region or what is also referred to as the Federal Interstate Greater Chicago Air Quality Control Region?

A I think again for two reasons, perhaps not the same two, but one is similar, these facilities in aggregate are all in this area where air pollution requirements are going to impinge upon them and may impinge quickly.

Many of them, I understand, either have or are considering the use of alternative fuels. In any case, many are concerned with this problem.

It seems well to recognize they had a common set of problems with respect to supply, and while it was necessary to look at their purchases, it is helpful, I think, to look at their purchases, because of their common problems, separately.

Second, in aggregate these are, in the main but not entirely, I believe non-utility users. I think there is one exception. There is one utility company in that area, Commonwealth Edison having been separated, and I think it is Northern Indiana Public Service Company? Other than that, they are industrial users.

[2222] They, in aggregate, have a volume of demand which again requires them to utilize coal from many areas. Because Chicago is the kind of a rail hub that it has been traditionally, the plants in this area are served by rail from virtually all of the producing areas in the state.

I think for that reason, too, it is helpful to regard it as a definable separate sub-market. I think there is insight in that separation.

Q Now, having placed—well, with that background and having looked at these statistics in Defendants' Exhibit 55, and with reference to the combination of all the overlays on the demonstration map there, what have you concluded or what do you believe this analysis shows with specific reference to Freeman and United Electric and with specific reference to the merger here under discussion?

A Well, the choice of these four producing areas is clearly intended to reflect the areas where these two companies have their producing facilities.

The blue color has been used for the southern Illinois and the Springfield area where the mines of Freeman are located.

The red for the Fulton-Peoria and the Belleville area where the mines of United Electric are located.

[2223] Let me start with a couple of negative conclusions. It seems quite clear looking at that graph as well as the data that underlies it, that the talk of Illinois as a relevant market in which to appraise that merger makes very little sense, just in terms of where the coal from the areas in which those companies produce is.

Second, it seems to make relatively little sense to talk of the area that was defined as the Eastern Interior Coal Province Sales Area. It is, I think, interesting, in fact perhaps very interesting, that none of the coal from those four producing districts goes into the state of Indiana.

The reason, I think, is that I think there are substantial coal reserves in Indiana, and we have testimony to the effect that Indiana utilities tend to purchase

coal not from these areas, but from the mines that are closer to them.

The third conclusion is that it seems appropriate to visualize a series of sub-markets that cross state boundaries, none of which, however, are as extensive as the state, which can best be defined in terms of things like river transportation that accounts for, in that case, the Belleville area and the Fulton-Peoria sales [2224] or the particular kind of railroad facilities that may account for much of the shipment of the southern Illinois coal.

Southern Illinois coal, as I read the record, tends to be high BTU coal located on rail facilities. Those things seem to support longer rail shipments than would be supported by the lower BTU coal from the other areas.

In any case, one does have the distinct impression and, as we saw in the statistics, we pick up a great volume of the transactions, but one has the distinct impression of definable sub-markets.

These are not blurred but distinct sub-areas. The overlaps between utility and non-utility suggests that although that distinction may be important in other purposes, it is not strictly important in the geographical delineation.

The blue areas and the red areas very largely do not overlap.

[2225] This again, I think, confirms data that is in the record that very largely the Freeman—that coal from the Freeman mines and coal from the United Electric mines were largely directed to stations that were in different areas, that they were not in close competition with one another.

Your Honor, I recognize—

MR. CUSACK: The Government objects to it on the basis you are misstating the facts and the evidence in the case, just for the record, your Honor.

THE COURT: All right, the objection may be noted.

MR. CUSACK: Thank you.

BY MR. HEDLUND:

Q Would you like to have the last part of your answer?

A I am not sure what I was saying.

MR. HEDLUND: Could you read back the past portion of the witness' answer.

A (Read by the Reporter.)

THE WITNESS: I think I was finished.

THE COURT: You were finished; all right.

BY MR. HEDLUND:

Q Do you recall exactly what evidence in the record you were specifically referring to in talking [2226] about Freeman and the United Electric?

A I think a large number of the customers testified that they considered coal from the Belleville area, that they did not in fact consider coal from other areas and vice-versa.

There was a great deal of this testimony to the effect of users of coal, what they considered to be the relevant sources of supply and the kind of non-overlap that we seem to have identified statistically appears to be confirmed.

There was also a good bit of testimony, I think, to the effect that where there were common shipments to common facilities—

Q You are speaking here of Freeman and United Electric?

A Yes—that some of these could be understood in terms of somewhat different product than was involved.

I am thinking here of the fact that certain stations received coal from the Belleville District and dust from the Southern Illinois District, and the testimony, as I understood Mr. Nugent to talk of it and perhaps some of the other people as well, suggests there were special reasons which would account for that kind of overlap.

[2227] Q You are referring, just for purposes of the record, to Government's Exhibits 88 through 90, that is the list of common customers or of known common customers?

A I was referring generally, but I have in mind that list of common customers which as I recall it, purported to identify the common customers.

When I looked over that list, outside of Commonwealth Edison which was an important customer of both companies, a company which the record clearly shows purchases heavily in the Fulton-Peoria area, in the Belleville and Southern Illinois—

Q Southern Illinois?

A Excuse me, in the Springfield District in those three areas.

Outside of that many—although I would have to go through the list to detail it—of the apparent customers reflected a somewhat different product in this use of dust—are reflected in some cases, as I recall, clearly complementary shipments; shipments for example, I believe on a Freeman contract by United to TVA that was discussed at some length in the record and appeared to be clearly a shipment that was made on the Freeman [2228] contract at the time when the river was closed, so that the coal could not go up and it was done to keep the United mines operating. Clearly, it's the common customers that received a good deal of attention in the record and I have read that record with some interest.

Q Based on all of that then, Dr. Steiner, what is your opinion in terms of the existing mines of United Electric and the reserves of those mines, and assuming that they are all free, and not already committed, what is your opinion with respect to the competition, actual or potential or lack thereof, between Freeman and United Electric?

A To be sure I understand, you are asking me to what extent do I think that the coal in the Freeman area, the coal in the United area, the area of the United mines are—if we assume it is available—are available to the same customers?

Q Yes.

A And I would say on the basis of this evidence, and if the structure of transportation rates and quality of coal continues in the future as it has in the data we have, they appear largely to be non-overlapping for this group of customers.

[2229] Commonwealth Edison clearly is taking coal, to some extent, from both companies by virtue of its pur-

chases in both the Springfield area, from the Crown Mine, and also from both Fulton-Peoria and Belleville. [2230] Q Do you have, Professor Steiner, with you a copy of Defendants' Exhibit 287?

A Yes, I do.

Q For purposes of the record, this is an exhibit of four pages containing four tables, the first of which is entitled "Fraction of Total Illinois Production of Leading Companies other than Peabody;" the second of which is entitled "Average Production per Company, Illinois Production of Illinois Producers;" the third is entitled "Changes in Concentration in Illinois Coal Production since 1959, two measures"; and, the fourth and final is entitled "Changes in Concentration in Illinois, Indiana and Western Kentucky since 1959, two measures."

Did you prepare these tables, Professor Steiner?

A Yes, I did.

Q And on what are these based?

A They are based entirely on the Government exhibits as they are listed and my puzzling through those exhibits although as I indicated earlier, I didn't find the Government exhibits answered all my questions, I thought they might answer some of my questions or some questions and in particular I had some reservations about the definition of product and the inclusion of both [2231] metallurgical and other coal, and so on.

It seemed to me that they might reflect something of the changes over this period from '57 to '67, and particularly they might reflect something to me about the behavior since 1959 in terms of whether the control by Freeman of United Electric, which I date to have taken place in 1959, to see what effect if any, one could see in the concentration as measured by this set of indices, what change had occurred over the 10-year period. Thus what I am saying here is I was trying to take not as indications of the level of concentration for reasons I have indicated earlier, but as some clue to the trend in concentration and see what, in fact, had happened.

[2232] Q Directing your attention to page 1—

A Yes.

Q —I wonder if you would explain, please, what that table shows in your opinion?

A Well, as I said, I think earlier I was struck when I began to look at the list of mergers that were prepared, how importantly Peabody had figured in those mergers.

Q May I interrupt just a moment?

A Surely.

Q When you are referring to the data prepared with respect to mergers, are you referring to anything other than the Government's information and exhibits with respect to coal mergers, which I believe is Government Exhibit 87? Are you referring to the evidence?

A I don't know the exhibit number, but it's the Government exhibit listing the mergers and the acquisitions by companies, showing the acquiring and acquired companies, number of tons and coal and the date that I was concerned with.

In any case, my first intention was concerned with the importance of Peabody in those mergers; and my second, as I looked at that series of exhibits dealing here with Illinois, Exhibits 62 through 72, was the fact [2233] that in the Government statistics the merger between United and Freeman was effectuated in the statistics as of 1967, and this gave a substantial increase in the apparent concentration figures as of that date.

What I first did was to recompute the figures effecting that merger, that is, combining the production—these are production figures—of United and Freeman as of 1959.

Q These are production figures again from the Government's exhibits, is that correct?

A These data are all taken directly from the Government exhibits.

In some cases the percentages may not be the sum of the percentages because I added the actual tonnages, and divided, and I may have made an error.

The computations were made by me. I have checked them. I believe them to be accurate, but although I have here a record, these percentages are in each case computed by taking the aggregate production and dividing it by the total.

In any case, this first table attempts to look at the fraction of total Illinois production by what would be the two largest, the four largest, the six largest and the eight

largest producers then substraticng [2234] out the largest, which was Peabody, so that we could look at the merger trend, Peabody's acquisition, and by this horizontal line drawn between '58 and '59 effectuating that merger in the statistics, for statistical purposes in 1959, what it shows, I think, if you look at it.

Q May I ask this one introductory question before you state that?

A Surely.

Q The title, Freeman, on the second column from the left, that is just so that we are clear, this includes United Electric after 1959?

A That is correct, and Freeman is merged in my statistics here in the 1959 statistics, arguably that perhaps should have been done in 1960 if October '59 was the date, and in any case—

Q Please continue.

A Excuse me.

Q Please continue. I am sorry.

A What that appears to me to show is how remarkedly little, if you like, the market share of these groupings have increased over that 10-year period.

We can see that again in more detail on the third page of this, by just running through it, Freeman, in fact, if you take this definition, has a smaller share [2235] of the market in 1967 than it had in 1959.

The second, third and fourth producers went from 42 percent to 44 percent, over that period.

The top six producers—the second through sixth—missing Peabody, went from 54.7 to 57.8, and so it goes. In other words, remarkably stable percentage shares of Illinois production.

Now, again reserving that I do not really think these are concentration ratios, because I do not think they are in a well defined market for reasons perhaps that show on those maps as well as anything else. That is what this, I think, this table shows.

It also shows between 1958 and 1959 what is the statistical affect of the United-Freeman merger if one effected it as of that date.

Now, it's of course very difficult where you have that period of rise and control to date precisely when statis-

tically the merger should have been effectuated but October 1959 seemed to me the most reasonable date.

Perhaps, Mr. Hedlund, if we turned next to the third sheet, which looks really further at this experience since 1959, the third page, I will come back to the second, the Government in one of its exhibits, perhaps it was No. 70 —I don't remember the number—gave a—that showed [2236] the production of the top two, the top four, and the top ten companies—those Government statistics for these years '59 to '67 are given in the first column of each of the three banks of these three groups of this table.

[2237] I have here picked '59 to '67 because I was particularly concerned with the question, really, as to what if any triggering effect the United-Freeman merger might have had on concentration in the industry, and taking again these figures, not as absolute indications, but as indications of trend.

For example, if we look at the production of the top two, according to Government statistics, it appeared that that had risen from 36.2 percent of the market to 52.9, a total change of 16.7 points, a very substantial percentage increase of the 36.2 in 1959.

The adjustment in the next column consisted merely of effecting that merger not in 1967 for statistical purposes but in 1959. That reduces that 16.7 increase to an 8.7 point increase.

Immediately below that you see that Peabody's increase in market share was 10 points. This, in fact, largely, I think, explains, is explained by Peabody's mergers, these data, I should say, assumes still as within Peabody the tonnages that have been since ordered divested by that other case, so that this has no effect for the subsequent divestiture that might have been made. But that's with respect to the top two of what I believe to be correct, an increase of 8.6 percent—10 percent [2238] more than all of it was accounted for by growth in Peabody; a loss of minus 1.4 by the second company, which of course, was Freeman.

In the second column, the second bank there dealing with the top four, the apparent increase of 20 points in the concentration ratio from 55 to 75.2 reduces to 12

points when one make the merger effective in 1959 as distinguished from 1967, of those 12.1 points, 10 again, the same 10 again are accounted for by Peabody.

This makes the change in concentration due to the activity of the other three, up here, to be relatively modest.

With respect to the top 10, and it was the Government, I might say, who chose 2, 4 and 10 as an appropriate groupings, the changes are less dramatic, but there indeed it turns out that the second through tenth company decreased 1.3; the total increase is 8.7, being more than accounted for by the increase in Peabody's market share.

So it seems to me that those two changes, that is, one effecting the merger date, but I think more realistically, affects the change in control as an economic matter; second, removing Peabody suggests no trend in concentration in Illinois on these statistics as a result of the Freeman-United merger.

[2239] While we are, I did not—I've done on the fourth page here a similar analysis for the three-state area; Indiana, Illinois and Western Kentucky.

Once again to abbreviate this discussion, you will notice that with the production of the top two an apparent increase of 15.5, reduces to 10.7 when you adjust it for the merger. Of that, 12.2 is accounted for by Peabody. Thus, Freeman, the second largest firm and I guess it's not—I don't remember whether Freeman was in every year the second largest firm in that three-state area—that can be checked.

In any case, the top two, their per share decreased. The top four, absent Peabody, their share was roughly constant,—0.8 percent change, which is hardly significant; and the top ten did in fact increase by 5 points; but of the total increase of 17.5, the great bulk again was Peabody.

What I think this suggests to me, those three tables together, suggests that very largely the change in the concentration as measured by the Government and as included in these is partly what I regard as the statistical change, as I would see it, dating of the merger in 1967 instead of—in 1967 [2240] statistics instead of the

1959 or 1960; and second, the very large increase in market share of Peabody.

So, I turn to the second table which really looks at a rather different issue.

You recall that most of those Government statistics, year after year, defined certain leading companies, leading companies in the Illinois statistics were defined as companies with production of 300,000 tons or more in the year in question, and having run down that list there would then be a list of the remaining companies, and we saw that that number of remaining companies declined from something like a hundred-odd down to 29 or 30, as I recall, by the end of the period and I was really rather curious as to what we could find out about the size of the companies that were not specifically listed.

What I did was to compute—and this is really the right-hand column of the second page—I simply took the total tonnage attributed to these non-leading companies and divided by the number of them to find the average tonnage per company.

Now, if you realize that the tonnage that was possible was anywhere between one ton and 299,000 tons, one would expect if these companies were [2241] evenly distributed in that range to find an average somewhere in the neighborhood of 150, 100, 150, 175 thousand tons.

As you will see, those tonnages are very much smaller, which suggests and re-enforces the kind of impression I already had had, that these other than leading companies were in very large part, very small companies indeed, and they were not really in the same kind of market, in the same kind of situation as the big companies.

It is not surprising to me that they, as their market, as I would see it, their market being very largely the spot market, that with this kind of production they were not in position to deal in the utility market nor indeed to be very attractive merger bait for a larger company. There simply was not that much production at stake.

We don't have records or I don't have records of what happened to each of those companies, but I think that this re-enforces the notion that they disappeared.

[2242] One thing I think is of some interest in looking at that, the average size of those companies has increased

somewhat over the years in '57, '54, '57, up to '65, '66, '67. That suggests that even in that group of companies under the 300,000, the attrition appears to have been greater in the smaller companies within that group.

In contrast, if you look at the other side, you see the phenomenon we referred to this morning; the large companies are not only large compared to the dogholes, but they are getting larger over this period. They are getting larger in part, as we saw, because they are dealing with bigger mines, and, of course, included in these things are the facts on such mergers that have occurred and of the Peabody mergers in particular.

Again, in the statistics I have made certain assumptions that had to be made with respect to the Government statistics. I have assumed that UEC and Freeman were merged in 1959 for statistical purposes; this affects not only the tonnage, it affects the number of leading companies, so that when you compute an average you are dividing by a different number than what would otherwise be the case.

I also assume that CW&F was in fact a part of [2243] Freeman in 1957 and in each subsequent year. I think there were two versions of the table of the exhibit I had, and one could go either way as to assume that was merged or was not. It seemed to me from what I knew of it, it was best to assume the merger.

Q Now, Professor Steiner, I would like to turn to your opinion of the effect of the merger of United Electric and Freeman on competition in the markets that we have been discussing.

I want to ask you whether there are a number of factors important in your judgment in considering your decision in making such an evaluation and again with specific reference to Freeman and UEC and if you feel them to be important why.

The first factor I would like to ask your opinion as to whether it is important in making this assessment of the effect of the merger is the nature and the size of the buyers involved.

A Yes, I believe it is important.

[2244] Q Could you tell me why?

A Well, I think when you are discussing a transaction in which a large buyer is devoting his executive talent to the purchase, there is likely to be a degree of market power perhaps, and market wisdom, certainly, that clearly gives for a large buyer and an informed one some protection against being misled and being taken advantage of in any way; thus other things being equal I would think large buyers buying large quantities of coal being well-informed would increase the degree of competition in a market.

Q Secondly, I'd like to ask you what the factors relating to the way in which these purchasers buy coal is necessary to consider in evaluating the effects of this merger?

A By the way in which—do you mean the long-term contracts, the large purchase, or do you mean the fact that these are negotiated contracts for which they take bids, and so on?

Q I mean both.

A Well, I think each is important. I think it's very clear that when a company is making a purchase of coal, let's say for a million tons a year for 20 years, committing themselves to a very substantial [2245] expenditure of funds and indeed often building a boiler to utilize this coal, it suggest that this company will search among its alternatives fully, will explore the possibilities fully, that these things, other things being equal, will tend to give a degree of competitive rigor to the buying side of this market that will put great pressure for conforming with its promises on the seller.

I think secondly the fact from what I understand about it, the procedure of seeking bids, of specifying quantities, of really discussing, not only this fuel of this coal producer as against that coal of that coal producer, but considering as well alternative sources of energy, if one is talking about utility purchases.

Each of these things adds to the degree of pressure on the buying side of the market, and thus other things being equal, adds to the competitiveness of the market.

Q Then taking the next one, do you believe that in evaluating the merger before us that it is necessary to

evaluate the degrees of actual and potential uses of other forms of energy?

A Yes, I do. It seems to me, given the facts [2246] in this case and the testimony of various people, particularly the evidence with respect to TVA and Commonwealth Edison, the fact of nuclear as a substitute for coal in the future, seems established. At what rate that will occur, clearly is a function of relative costs, and of air quality control things. But it seems to me that one must take those into account. It seems to me one must take into account at the present the influence of other forms of fuel, such as gas, and oil.

As I recall, Mr. Corey who testified that approximately a third of their power at certain stations was now being supplied by gas.

In any case, we have had testimony from a number of users that gas is currently playing a significant role.

I take it that residual fuel oil may in the future play this role. To the extent it does, it clearly, it exerts competitive pressure on the market in which coal producers sell their source of energy.

[2247] Q Do you believe, again, in attempting to make an assessment of the effect of this merger, do you believe it necessary to consider the characteristics of the coal producers other than Freeman and United Electric, and, if so, why, and which characteristic?

A Yes, I do. I think that we have here, and it's important that we have here eight or nine substantial companies, or ten, I don't remember the number, producing coal for this market, some of whom are—the number varying—are in a position to bid for demands for coal, requests for bids for coal, for these things.

We have a situation where there are a—I think one witness—I don't remember who it was—spoke of an ample number of companies producing coal, a substantial number of sellers here, is clearly of some interest, is of some interest to me and I would say that other things being equal, having this record of a substantial number of strong companies is a pro-competitive factor in this market.

Q What about reserves of those companies?

A Well, I think that—something that I have been implicit in all my thinking—perhaps I haven't said it as explicitly—we are talking here not about—if we are talking about competition, not about produc- [2248] tion on past contracts, but about the negotiation of future contracts, of contracts for a new production. It is clear that a company, what it has to sell is reserves not previously committed and thus if it is, as the evidence in the case suggests, it suggests to me that United has a very small quantity of uncommitted reserves, then in that case it has a small effect on the market with respect to the use of those reserves, and thus the reserve position is important in the sense that a company, in order to be an effective force, must have sufficient reserves to credibly bid on contracts demanding large quantities of coal.

Q Again, with reference to the evaluation of the merger of Freeman and United Electric before us, is it necessary in your judgment to consider the characteristics of the coal that they sell or each of them sells, or indeed as well the characteristics of the coal sold by other producers?

A Well, yes, I think it is. I think that if one is talking about the sales of coal to an existing facility, the evidence suggests that those facilities, the boilers are designed to utilize coal with certain specifications and within certain limits.

It is quite clear from some of the evidence [2249] that the northern Wisconsin utilities that use high BTU coal were not in a position to use low BTU coal, and so on.

It is clear looking at the statistics that we have that the characteristics of the different coals, different regions, vary substantially, vary in BTU content, in moisture content and in other ways, in sulphur content. I expect the sulphur content may turn out to be a very important consideration and an increasingly important consideration in the future.

[2250] Q You have touched on this briefly with reference to the actual or potential uses of other forms of energy, but I ask you whether again in evaluating the impact of the merger you believe it is necessary to consider the environmental considerations or the air pollu-

tion problems about which there has been such a great deal of evidence?

A Yes, I think I have spoken to this, but let me briefly summarize it.

I think that air pollution considerations are going to make more difficult coal's role in the future. It seems perfectly clear that we are suddenly taking very seriously the matter of air pollution, and that air pollution control regulations will be enforced and that the coal users will either have to find substitutes for coal, find ways of finding a low sulphur coal or will have to introduce techniques for eliminating the sulphur dioxide and other pollutants that come out. None of these, as I suggested earlier, is going to be costless, and by virtue of being costly they are going to make the marginal consideration, let us say, between nuclear and coal closer; for a facility that is not close today, it will be closer tomorrow in my view because of this factor.

[2251] It is a disadvantage under which producers who have high sulphur coal reserves are going to overcome, if they want to sell their coal.

Q With reference to your evaluation, again, as an economist of the impact of the merger between Freeman and United, do you believe that it is necessary to consider the location and the quality of United Electric's reserves?

A Well, I think it's necessary to consider all three: the location, the quantity and the quality.

It is perfectly clear, we have talked about quality, and we have talked about quantity, and that the maps have indicated, the statistics indicate that transportation is a very important cost of the delivering of coal and that, therefore, location is a very important part, and I wouldn't say the most important but a very important aspect of that along with the quality of the control—excuse me,—the quality of the coal.

Q Do you believe it's necessary to consider in your evaluation as an economist the degree of or a lack of United Electric's capability to become a deep coal miner?

A Well, I think that—yes, I do—and I think that is because it relates directly to the reserve issue.

If United does not have sufficient reserves [2252] to be a competitive factor in these markets, one way in which it might be a competitive factor would be to acquire such reserves.

If it lacks underground mining capability, that way is closed to it, and, therefore, it is an important factor in the evaluation.

Q Finally, Dr. Steiner, in your evaluation do you believe it is necessary to consider United Electric's likely success in attempting to acquire additional economically mineable strip reserves in locations meaningful to the market that we have discussed?

A Oh, yes, I do. Obviously, once again, a way for it to overcome its lack of reserves would be to find more reserves, if there are such reserves to be found. If they are not to be found, that is an important factor in evaluating its competitive position.

MR. HEDLUND: Your Honor, I believe I can finish in about 15 minutes if you can go a little bit late.

THE COURT: All right. You may proceed.

[2253] BY MR. HEDLUND:

Q Professor Steiner, considering all of these factors that I have mentioned and even if you will, factors that perhaps I have not mentioned, what opinion, as an economist, have you reached with respect to the effect on competition in the markets we have discussed of the common ownership of Freeman and United in the past?

A Well, as I think I suggested to you for the purpose of this question at least, in my own view, that this merger has been in effect now for a decade.

Looking at the statistics of this from '59 to '67, and the statistics of the industry over this period, it seems to me to have been a highly competitive industry in its preformance and its ability to achieve low prices to respond quickly to a massive set of challenges on it.

It seems to me that the health of this industry is very good in this period, and I would say there has been —that I can find no adverse effect on competition of this merger over this period.

MR. CUSACK: Your Honor, for the purposes of the record, I would like to move to strike the last answer on

the grounds of the Supreme Court decision in the Von's [2254] Grocery case, just for purposes of the record.

THE COURT: All right. The record may so show.

MR. CUSACK: And Pabst and others.

THE COURT: All right.

BY MR. HEDLUND:

Q Considering the factors again that we have been discussing, Professor Steiner, I would ask your opinion as an economist as to the likely future effect on competition in the markets that we have discussed of the continuation of the common ownership of United Electric and Freeman.

A Well, in answering that question, let me make clear that I am assuming, as I believe that United currently has all but a very small portion of its reserves committed to existing contracts, that it is unlikely to acquire large quantities of mineable strip reserves.

Under the circumstances, I believe the continued joint operation is likely to enhance competition in the coal industry because I think it will make for an efficient utilization of the remaining reserves of United in conjunction with the back-ups of Freeman and potentially in terms of utilization of joint efforts of the two companies, so that I think without additional reserves that it can mine it would not be a competitive factor at all, [2255] I think that its reserves, its existing reserves, will likely be effectively utilized under the continued joint ownership. I see no adverse competitive effect.

Q Finally, Professor Steiner, what opinion have you reached as an economist with respect to the likely effect on competition in the markets that we have discussed that would follow from a divestiture from Freeman-General Dynamics of the coal properties and of the company itself, United Electric Company?

A May I ask you in that question, do you assume that where this company has current contracts that include a back-up guarantee by Freeman that that back-up guarantee would continue or would that be removed?

If it were removed, I think there would be some question as to whether it could fulfill even its present contracts, but I can discuss that either way.

[2256] Q I would like you to do that. Would you discuss it both ways?

A I think without such back-up it might well be in serious trouble even in meeting its current commitments.

I am not a lawyer, I don't know the consequences that would follow, what would happen with respect to these existing contracts.

It would clearly, if I understand the record, not be in a position to bid in a substantial way on even one more, if I understand, the nature of its mineable reserves, on one more utility contract because it simply could not give the kind of guarantee of performance, does not have the reserves, and it would not appear to be a credible supplier, on even one more contract.

It would therefore seem to me at best to be a company that was attempting to do its best to liquidate it existing commitments, it would not be a pro-competitive force.

If it had sufficient reserves, let us say, due to back-up guarantees, to commit to its existing contracts, the situation would only be changed in the sense that it would have perhaps no difficulty in [2257] meeting those commitments but still would not be able to enter into additional contracts unless it were in a position to find additional mineable reserves which it had the capabilities of mining. I don't know.

There is one other factor in this that I do not know about. As I recall all of United's coal or virtually all of its coal is high sulphur coal. What will be the status of its contracts, long-term contracts, if sulphur control legislation comes in, I do not know. I do not know. Is this the responsibility of the utility or of the coal company, whether this will void its contracts, and so on?

But it seems to me that is an aspect of the problem that I should think would be unpleasant for The United Electric Coal Companies in the future.

It will be in any case, but it will particularly so standing alone.

MR. HEDLUND: May I just have a moment, your Honor?

THE COURT: You may.

MR. HEDLUND: Your Honor, that is all I have.

THE COURT: All right. We won't start you on cross examination, Mr. Cusack, unless you are in such a hurry to start.

[2260]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF
vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS

Before HON. EDWIN A. ROBSON, Chief Judge,

Tuesday, April 21, 1970,

10:40 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN,
MR. HUGO SIMS, and
MR. RICHARD J. BRAUN,

appeared for the Plaintiff;

MR. HAMMOND E. CHAFFETZ,
MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

MR. CHARLES BANE,
MR. JOHN SARBAUGH,
MR. JAMES M. FOLSOM.

• • • •

[2272] MR. CUSACK: Your Honor, at this time the Governments moves for the admission into evidence of the deposition of Dr. Steiner, which I took last October, together with the deposition exhibits in that deposition.

THE COURT: Any objection?

MR. HEDLUND: No, your Honor. I believe it is already in.

MR. CUSACK: It isn't.

THE COURT: It may be admitted.

(The deposition and deposition exhibits of Dr. Peter Steiner were received in evidence.)

PETER STEINER,

called as a witness by the defendants, having been previously duly sworn, was examined and testified further as follows:

CROSS EXAMINATION

BY MR. CUSACK:

Q Dr. Steiner, you have testified in regard to some national statistics prepared by Bruce Netschert, is that correct, in regard to the coal industry?

A That is correct.

Q Is it your opinion, Doctor, that there is such a thing as a national coal market?

[2273] A No. I believe there is a national coal industry.

Q There is an industry?

A There is a producing industry, and statistics are published by the Bureau of Mines with respect to all American coal producers.

Q In regard to the industry, this is a recognizable industry, with its own trade associations, and so forth?

A Yes, there is.

Q Getting back, sir, to the national coal market—perhaps it would be easier for everyone if we could use Defendants' Exhibit 144—glancing at that, sir, if I can assume that there is no national coal market, which is your testimony—is that correct?

A Would you complete the question?

Q There is no national coal market, correct?

A I think not, but, as I said yesterday, I believe that markets are defined in the context of some question. There may be a national market for coal mining equipment, for example, which is sold to coal mines, something of this kind.

* * * *

[2275] Q Directing your attention to the map of the United States as set out in DX-144, could you tell us, if you know, whether there are any regional markets contained in the nation for the production of coal?

A I think that map reflects the service areas of certain coal consumers and also consumers of other fuels. I don't think that map goes to the question of what is a coal market. I think we have testified, I have testified, to the fact that looking at some of the consumers of coal in this Midwestern area, I think it is possible to define markets for them.

Q What I am asking you to do is to look at the map as an outline of the United States, the Continental United States. You can either ignore or mention the various colors on this map which are the service areas of the public-owned electric utilities. But just having general regard to the map of the United States, could you tell us if you have reached any conclusions in regard to regional markets for the production and sale of coal throughout the country?

A I have not come to conclusions about regional markets. If you look at the map immediately behind you, I have there talked and did talk yesterday about what seemed to me to be definable markets for the sale [2276] of coal.

Q Other than your definable markets based on the freight rate districts in Illinois, which is what this map is talking about, is that correct, sir?

A Could I have that question?

THE COURT: Read the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A I think that is not correct. I think those are based on the analysis of data with respect to both consumption and production of coal, so I paid attention to the identity not only of the location of producers, but also to the location and purchasing habits of customers.

Q All right. Other than that map which you discussed yesterday, the overlay map, having reference to the map of the United States, have you reached any conclusions in regard to any other areas in the country which could be considered proper economic markets for the production and sale of coal?

A I have not analyzed any other markets, Mr. Cusack.

Q Thank you. Would you assume that there are other markets, other economic markets.

[2277] A Yes, indeed.

Q For the production and sale of coal?

A Yes, indeed.

Q It would be something less than the United States, would it not?

A I would be very surprised if for any purpose whatever it made sense to talk about the United States as a whole as being a sensible economic market with respect to coal.

[2287] Q From the period of 1959 to '69, would you have considered United Electric, or do you consider United Electric to have been a substantial coal producer?

A A substantial coal producer, yes.

I do not, if I may just—I do not, over that period, consider it to have been an independent substantial producer, because it is my view, as I expressed it yesterday, that from October of 1959, on, it does not make sense to treat it as if it is an independent coal producer, but that it was effectively under the same control as that of the Freeman Coal Company, so that from my point of view it seems to me that its operations should be looked at in the constraint of which I think was the effective control of its operations.

Q In regard to that, sir, is it your reading of the record that the Directors of United Electric, from 1959

to 1966, when United Electric was merged into General Dynamics and became a wholly-owned subsidiary of General Dynamics, is it your reading of the record that the Directors ran United Electric for the benefit of Freeman and General Dynamics?

A No, sir.

Q Professor, would the future viability of [2288] United Electric in your opinion depend decisively on its coal reserves?

A It would depend—perhaps I can have that question read back.

THE COURT: Read the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A If by "viability" you mean its ability to continue selling coal to customers on contracts, it would depend decisively either on its uncommitted reserves or on its ability to acquire mineable additional reserves.

That is perhaps a definitional answer. I would define "viability" in the market sense as its ability to engage in market transactions. And in that sense clearly what it has to sell, in my view, is reserves, which it either might have or might potentially acquire.

Q Your answer then to my question is "yes"?

A Perhaps if I am to give a one word answer I could have the question re-read.

THE COURT: Read the question.

MR. HEDLUND: Your Honor, I'm going to object. I think the witness has answered the question.

* * * *

[2304] Q And may that also be available to consumers within the Springfield District?

A I think if you are telling me that there is coal of the same general location as the Crown Mine, let's say, in the Springfield District—

Q No, sir. The Crown Mine is at Farmington, which is here (indicating). The Menard, Cass, Morgan, and Sangamon areas is here (indicating). Springfield is there, really between them.

A I am sure there are some, if there were this coal—I am sure there were some consumers of coal to the east of that whole area that you described who would find it possible to utilize that coal. When I say I am sure of that, I would suspect that would be the case. Where they are located or which facilities you are talking about, whether you are talking about utility coal—I think one of the major utilities in that area has a minemouth plant, if I recall. Presumably that coal would still not be competitive with the minemouth plant.

But again I think I need more information, and even with more information I perhaps need more expertise to decide who would be the potential customers of that mine.

[2305] As I think we know, finding which contracts a coal company can bid on requires a good deal of sophistication on the part of the coal mining company, and knowing which coals it can use requires a good deal of sophistication on the part of the purchasing company. I have neither of those sets of sophistication, so I feel at a great disadvantage.

Let me say this: that the statements I have made about markets and market areas have been based not on my knowledge of the inherent logic of certain transactions, but on the basis of the analysis of data that has been made that shows which coal actually goes to which locations. Therefore, it is revealed marketability as distinct from theoretical marketability.

You are now asking me where coals might go, and I don't really know that of my own expertise.

Q Yes. And your overlay chart, then, is it fair to say, is based on 1967 statistics, is that correct?

A Was that the year of the statistics? Whatever the year of those subpoenaed statistics was. Was that 1967?

MR. HEDLUND: We will stipulate that refers to [2306] 1967.

THE WITNESS: Yes.

MR. CUSACK: Thank you.

BY MR. CUSACK:

Q So that would not, sir, account for any shipments from the Carlinville Mine of Humble Oil, the Crater Coal Company to the Powerton Plant at North Pekin, is that correct, sir?

MR. HEDLUND: May I have the question, your Honor?

THE COURT: Read the question.

Q (Read by the Reporter.)

MR. HEDLUND: Your Honor, I don't understand what Mr. Cusack is referring to when he says, "Well, that would not account for—".

THE COURT: Are you objecting?

MR. HEDLUND: I am objecting.

THE COURT: Clarify your question.

MR. CUSACK: Yes, your Honor.

BY MR. CUSACK:

Q The overlay map which we have been discussing, sir, which Mr. Hedlund has testified is based on 1967 production, and the markets set up in the overlay map as well as in the DX-55—is it true that that information would not take into account shipments from [2307] the Carter Coal Company mine at Carlinville, Illinois, in Macoupin County, to the Powerton Plant of Commonwealth Edison at North Pekin?

A I do not recall that there were any such shipments in 1967.

[2308] BY MR. CUSACK:

Q There were none.

A None that I know of.

Q But you do know there was a contract, do you not, for coal to come from Macoupin County to the Powerton plant of North Pekin?

A Yes. I think I remember reading about an agreement, but whether the contract—I haven't read the contract.

Q The evidence in this cause shows that not only Humble Oil, Carter Coal Company, but Freeman owned substantial reserves in Macoupin County. The evidence

also shows that the Macoupin County reserves of Humble, at least some of them, will be sold to the Powerton plant of Commonwealth Edison at North Pekin.

Where would you estimate or would you believe the Macoupin County reserves of Freeman to be developed in the future would be destined?

A I don't believe I can answer that.

Q It is unknown, isn't it?

A It is unknown to me.

Q And you wouldn't know, sir, either, would you where the coal which underlies Cumberland, Coles, Clark and Edgar Counties will go when it is mined, if [2309] it is mined?

A I don't remember in the record sufficient discussion of those coals for me to know enough about their quality or quantity, nor do I know enough about the transportation to make a sensible statement as to where I predict they would go if and when mined.

Q There is evidence in the record, sir, that the Freeman Coal Mining Company is developing at this time its Orient No. 6 mine in the Southern Illinois freight rate district.

A Yes. I am aware of it.

Q Is there any evidence, sir, where the coal mined from the Orient No. 6 mine will be sold?

A Well, it would be my expectation, since, if my recollection is correct, the Orient No. 6 mine is very much like the Orient 3 and 4 mines in its low sulphur properties, and so on, that it would have very much the same potential markets that Orient 3 and 4 mines have, but I could be mistaken on that. My recollection on that testimony is that this is high BTU, low sulphur coal, that it has available to it the same kind of transportation facilities that the Orient 3 and 4 mines have, and therefore I would think without really remembering that it would have very similar conditions of marketability. [2310] Q I would like to now go through with you, if I may, with the leave of the Court, DX-55.

May I have a copy for the Court?

A I will need a copy as well.

MR. CUSACK: Just a minute, please.

May I approach the witness, your Honor?
THE COURT: You may.
THE WITNESS: Thank you for the copy.
MR. CUSACK: Yes, sir.
MR. HEDLUND: Your Honor, can we have just a moment while we get our third copy?
THE COURT: Yes.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

BY MR. CUSACK:

Q I would like to go over the DX-55 first with you, Mr. Steiner, Professor Steiner.

First of all, I would like to just establish that the overlay maps that you have been discussing here yesterday with the Court, these maps are based solely on DX-55; is that correct?

BY THE WITNESS:

A That's correct.

[2311] Q And these figures are for 1967?

A Yes.

Q Directing your attention, sir, to Table D-1F, which is the first page here, the utility facilities as located at the Fulton-Peoria sales area, the eight facilities set out under Arabic figure 1 on the first page, this area is not the same, is that correct, as the next page that is Table D-2F, under Arabic 1, the Commonwealth facilities in the Fulton-Peoria sales area; is that correct?

A The areas are not exactly the same I think that is shown on the maps. That's correct.

Q It is fair to say, isn't it, that the known utility facilities in the Fulton-Peoria sales area are much broader than the area encompassing the utility facilities located in the Fulton-Peoria sales area?

A More widely dispersed. I think the utilities are all river stations.

The non-utilities, which involved this list of companies that are there listed, were not all river stations, and

therefore the area that encompassed that volume of sales was a larger area physically, that's correct.

Q And is it true, sir, that in the non-utility [2312] facilities, the sales area as set out at Table D-2F starts with Clinton, Iowa, and ends up with Dixon, Illinois, and isn't it true that there are utility stations located in these very cities?

A There may be. I simply do not know the location of utility stations in Illinois that well, or in these other cities.

Q Well you do know that the Powerton Station of Commonwealth Edison is at Pekin? You know that, don't you?

A Yes, I remember that now.

Is Pekin in this?

Yes, I see it is.

Q And you know that there is a utility station at Clinton, Iowa, don't you? You recall the testimony of the man from the Iowa utility?

A What was his name? Excuse me.

Q Mr. Steele.

A Mr. Steele? If he so testified there is, I'm sure there is a station at Clinton, Iowa.

Q Directing your attention to the first page of this exhibit, Table D-1F, sir, how do you account for the fact that 316,000 tons of coal produced in the Belleville District were consumed by utility facilities [2313] located in the Fulton-Peoria sales area, that is, the facilities of the three companies under the first paragraph, first numbered paragraph?

A Well, I think that—I don't know, without looking at the underlying data, precisely which facility was receiving that shipment of coal.

It would not surprise me in general if I defined two market areas. And if you will visualize those as circles on the map, there might be some station that was in a position to receive from either of those two areas.

I think Belleville coal is, in general, river coal, the coal that can come up the Mississippi River, can fork and go up the Illinois River. And it is possible, though I don't know, that this is the station where coal has

come down river from the Fulton-Peoria mines, and up river from the Belleville mine. And this could well account for it.

I assume that is one possible explanation.

Another is that these may be shipments or contracts signed at different times, and that the particular economics of purchasing coal for a particular station could account for it.

Without going back to the underlying data, [2314] I don't think I can discuss it, discuss it in more detail than that.

[2315] Q Dr. Steiner, Nugent Deposition Exhibit No. 38 shows that the Peabody Coal Company operates the Mecco mine, Mine No. 28 in Knox County.

In which of your districts is the production of the Mecco mine assigned, having reference to your overlay map?

A I think the overlay map did not attempt, Mr. Cusack, to analyze the sales areas for each of the producing mines, or each of the producing districts in Illinois.

It attempted to look at the four producing districts that included the mines of United and Freeman.

Q The Elm Mine of Peabody, is that located in your Fulton-Peoria district?

A If it is in the Fulton-Peoria district, its tonnage is included.

Q Did you take into account the deposition testimony of Mr. Morrison of the Wisconsin utility headquartered at Green Bay in regard to the unit freight rate from the Elm mine, and the shipments of coal from the Elm mine to the Sheboygan, Wisconsin,—

A When you say did I take into account, are you asking me do I remember that testimony?

Q Do you recall that?

[2316] A I'm sure I read it, but I don't recall it at this moment.

Q Having reference to your overlay map and your Fulton-Peoria sales area, if over a million tons of coal a year were moved from the Elm mine of the Midland Division of Peabody Coal by rail on the Chicago North Western to Sheboygan facilities of the Wisconsin Public

Light Company or the Wisconsin Power & Light—I don't remember which—would this somehow affect—would you consider it would be the geographic market for your Fulton-Peoria area?

A Well, there are two things I want to say.

One, in the defining of these market areas it was too much to hope, too much in general to expect that one could account for every ton of coal going out of a particular area to every producer.

On the other hand, in this Fulton-Peoria utilities statistics, as here shown in this exhibit, I do not see any tonnage that is sold out of the Fulton-Peoria area that is going to a facility or utility facility in Wisconsin.

If what you say to me is correct, then there appears to be some kind of a discrepancy between your fact and this exhibit.

[2317] As I think I said to you, I did not, myself, prepare these exhibits. I discussed at some length the theory under which they are prepared. And I think I have every reason to believe that they are accurate.

And I'm puzzled by your example.

Q You did read the deposition of Mr. Morrison, though, did you not?

A Yes, I did. I read all of the depositions, but I simply don't have all of them at my fingertips.

Q And directing your attention, sir, to Table D-1F, is it a fair statement to say that 63 percent of the total coal production in the Fulton-Peoria freight rate district is sold to Commonwealth Edison Company?

A Well, with a couple of minor deviations I think that is what this table shows.

I think that the statistics here, as they were collected, didn't report actually on every ton of coal produced, but only shipments of 20,000 tons or more from specific mines.

These data, as I recall, were developed from the customer reporting questionnaire.

There is a similar table based on the Government's producer shipments. I also looked at those tables. They show very similar, though not identical numbers.

[2318] But with that qualification of the definitions of the coal that is here reported, this appears to say that

63 percent, 3,855,000 tons, was sold to facilities of Commonwealth Edison in 1967.

[2319] Q Based on Table D-2F, sir, in regard to the shipments of the Medusa-Portland Cement Company at Dixon, it is true, is it not, that Freeman ships coal to that facility at Dixon, Illinois, from its southern Illinois mines?

A I simply don't recall, sir.

If so, I assume that will show up on the common customer table which is your own exhibit.

I simply don't recall whether this was one of those—one of those shipments.

Q Directing your attention, sir, to Table D-3F, which is the recapitulation of sales of coal produced in the Fulton-Peoria Freight Rate District—

A Yes?

Q The fourth page of the exhibit, your Honor.

Is it a fair statement to say, Professor Steiner, that a coal consuming facility would attempt to purchase coal as near to its—produced as near to itself as possible?

A I think we have seen a great deal that the purchase of coal is not simply a function of one factor such as distance, that it is a matter of cost per BTU, a matter of sulphur content, of ash properties and so on.

I think that other things being equal, a [2320] mine that is closer tends to have lower transportation costs.

But there is no single metric of distance on this. And we have lots of evidence in the record that shows that some coal travels long distances, coal that goes from southern Illinois up into northern Wisconsin travels a long way. That is not the closest coal. That may be the best coal in an economic sense for those stations to buy.

Q And it may, may it not, also be the only coal available?

A I'm not sure I understand that.

In general as I have understood the record when people have purchased coal they have had several alternative sources of supply when they have purchased coal, had bids from several places.

I think—I can conceive situations in short term, shortages where a company has had to buy all of the coal it could get.

I guess I recall something that Mr. Corey said, that they were buying all of the low sulphur coal they could get. I don't know if he really meant that. I'm sure that had some kind of cost constraints.

I think your original question was did [2321] I think that, without regard to other factors, people always bought the closest coal.

My answer to that would be no.

Q I understand. There are other factors involved, aren't there?

A There are not only other factors involved, but mere distance does not seem to me to be the factor.

Q Right. And in regard to coal availability, there has been some evidence in the case that the reserves of the United Electric Coal Companies have all been sold, which reserves are located in Fulton-Peoria and the Belleville District.

Where are the customers presently served by United Electric, who are unable to get coal from United Electric, where are they going to turn for coal?

MR. HEDLUND: I'm sorry, your Honor. May I have the question back?

THE COURT: Read the question.

Q (Read by the Reporter.)

BY THE WITNESS:

A Well, I think perhaps there are lots of answers to that question for each customer.

I think that if I recall the United Electric contract with Commonwealth Edison has expired, or is to expire [2322] soon. I think we heard evidence that it was not being renewed.

Where Commonwealth Edison is going to replace that fuel, whether it does it by coal, it does by coal from which districts, whether it does it by gas, whether it does by atomic energy, I don't know.

I suppose facility by facility, as any coal contract runs out that utility, that facility has to seek an alternative source of supply. I do not think that the particular plight of United Electric with respect to its uncommitted reserves is mirrored by all other coal companies in Illinois.

So merely speaking about coal, it is not, I think, the question of the general exhaustion of Illinois coal reserves. I think there are lots of companies that have coal reserves; I think there are lots of coal reserves, though my recollection of this is not as clear, there are perhaps a lot of coal reserves in Fulton-Peoria, in Belleville, that are not yet committed, even though United does not happen to own those.

But again it seems to me that the question of where it turns for supply is the central problem facing any customer.

[2323] What we have looked at here is the pattern of where, as of 1967, they had turned for supply, what that seemed to show, which was that there were clear patterns of economically attractive regions of supply, and that these, if one assumed that what people did was because it made economic sense, then one could tell something about the structure of coal markets.

[2324] Q Well, there has been testimony, has there not, Dr. Steiner, that Freeman will back up some of the contracts of United Electric. If that is a fact, isn't it true, then, that the Freeman mines in Springfield, the Springfield district, and in the Southern Illinois freight rate district will serve these customers?

A Well, it shows that it is possible to serve those customers. It may well that if one wants to sell an 18-year supply of coal to someone who needs a 20-year supply, it makes sense to offer to transport up to two years of supply, and this was, after all, back-up guarantee—I take it one is never sure until the last 100,000 tons how many tons one will get from a given mine until one mines it—that even if they have to deliver on that, it may well be that the extra transportation costs on a two-year supply will make attractive a 20-year contract.

So I think it is one thing to talk about a back-up supply, a guaranteed supply, a complementary or supplementary shipment, and another to talk about offering to supply that facility for the whole 20 years, let's say, from the Springfield district or from another district.

Those are in simple economic terms very different matters.

[2325] Q Directing your attention, Professor, to Table D-3F, the recap of the Fulton-Peoria freight rate district, in regard to the total production of coal from the Fulton-Peoria district, 45 percent of the production goes to Commonwealth Edison Company, is that correct, sir?

A If that is what the table shows, and with the same qualifications as before, that is correct.

Q I am not arguing with the numbers. And 7 percent is sold to the Chicago Air Quality Control Region.

A It is sold to facilities within that region.

Q Yes, sir. Therefore, 52 percent of the total coal production of the Fulton-Peoria freight rate district is not contained in what you consider to be the geographic market for that district, is that correct?

A I think I tried to suggest, or these tables have tried to suggest, our concepts have tried to suggest, that there may be several markets, that there is a Commonwealth Edison market, that there is a market defined by non-Commonwealth Edison facilities in the Chicago Air Control Region, and that there is in addition that area on and around the Illinois River which is described in words some place and on the map in the overlay chart.

That coal going to those three regions, as [2326] distinct from other regions, adds up to in that case 98 percent of the production of the Fulton-Peoria coal covered in this exhibit.

Q I would like to try again, if I may. Based on Table D-3F, is it a fair statement to say that 52 percent of the coal produced in the Fulton-Peoria freight rate district is sold to Commonwealth Edison Company or to consumers located in the Chicago Air Quality Control Region and that 46 percent of the production is sold to facilities in what you consider to be the proper sales area for Fulton-Peoria coal production?

A I am with you until we get to the phrase "proper sales area for the Fulton-Peoria region." There is a defined area here, an area defined in terms of a set of customers of the Fulton-Peoria sales area. I am not saying there is anything proper about that concept, anything moral or otherwise proper about it. That is a defined area. It is an area that gets—these facilities get the

great bulk, 86 percent, of their coal from the Fulton-Peoria district. It sells an identifiable set of customers to whom Fulton-Peoria shipped.

[2327] I have no quarrel with the statistics. 46 percent of the coal from Fulton-Peoria goes to that group of customers. As you point out, 45 percent of the coal from that area goes to Commonwealth Edison, 7 percent goes to other Chicago area purchasers.

So if what you are saying is more coal from Fulton-Peoria goes to the Chicago area than goes to these group of customers, the answer to that question is yes. If you are saying something more than that, I don't quite understand what the statement is.

Q Professor, you are not saying, are you, that coal produced in the Fulton-Peoria Freight Rate District that is sold to Commonwealth Edison Company ends up in the Chicago area or that all of it ends up in the Chicago area?

A No. I misspoke, then. Thank you. It goes to stations of Commonwealth Edison. I think many of those are river stations that are in this geographic area.

Q It is a fact, is it not, that coal produced in the Fulton-Peoria Freight Rate District goes to Dixon, Illinois, to the plant of Commonwealth Edison Company?

A I simply do not remember. If that is a fact, [2328] I am sure the record will so show. We have here lumped, and I think of the Commonwealth Edison stations, for reasons I testified to yesterday—I think there are reasons for treating Commonwealth Edison separately. There are enormous demands, among others, which gives them a shipping problem and a scheduling problem as to where to send particular coals.

Q Coal from the Fulton-Peoria Freight Rate District goes to the Rockford public utility, does it not, which is now a part of Commonwealth Edison?

A Yes. I think that Rockford—again I don't remember the details, as to which coal from which area goes to which facility of Commonweath Edison. That can be looked up, and I am sure it is in the record.

Q I notice on page 1 of your exhibit on the Fulton-Peoria District Table D-1F you have excluded 92,000 tons of dust from the Crown Mine.

A Is that a question?
Q Yes, sir.
A It is not my exhibit. I have not excluded, just for the record. This is defendants' exhibit, and they have excluded. I was aware of their decision to treat separately. I think this could have been done two ways. It could have been included in the statistics [2329] and footnoted, or it could have been excluded and footnoted. There is, I think, here complete disclosure of what the facts are. There is from what I understand of the dust situation a distinct difference between dust and other coal; just as it makes sense to segregate different kinds of coal if they are in fact different, it seems sensible to segregate these dust shipments for which we have had testimony that they tended to be used in limited quantities and had special problems with respect to their handling.
[2330] The footnote on page 1, which you have reported, is in fact correct. Those 92,000 tons of dust go from Crown Mine to the Meredosia plants, as I recall, of Central Illinois Public Service.
Q Which is also served by United Electric?
A That's right. This was one of the apparent common shipments that, when I looked at it, turned out to be coal from the Fulton-Peoria district—I forget which mine; perhaps the Banner Mine, but I am not sure which one—of United Electric, and dust from the Crown Mine to this Meredosia plant, which is south on the Illinois River.
Q You would not contest the fact, would you, that dust is coal, would you?
A Dust is a form of coal. That is coal dust is a form of coal.
Q And screenings is a form of coal, is it not?
A Yes.
Q In regard to Table D-1S, which is the analysis of sales to electric utilities of coal produced in the Springfield freight rate district, my understanding is, sir, that for your Springfield freight rate district—and I have reference to your overlay map—you have only two utility facilities, is that correct, sir?

[2331] A I believe that is correct. There were these two utilities which constituted the great bulk of the sale by the Springfield producing mines to utilities other than Commonwealth Edison. These two picked up, as I recall, as the figures suggest here, 16/18ths of the total amount of 1,489,000 tons, with only 206,000 tons going to other utilities.

Q Excluding Commonwealth Edison?

A Excluding Commonwealth Edison, which is here shown as receiving—Commonwealth Edison is clearly the largest customer of the Springfield district.

Q Which is the largest public utility facility, sir, located in the Springfield district?

A Which is the largest public utility facility?

Q Yes, sir.

A I believe that is the Coffeen facility. Is that what it is called? The mine-mouth facility of Central Illinois Public Service.

Q Would it be the Kincaid plant of Commonwealth Edison Company, to refresh your recollection?

A Yes. I think that is correct. I think there is a plant—I think that is correct.

* * * *

[2336]

AFTERNOON SESSION 2:15 P.M.

* * * *

CROSS EXAMINATION

(continued)

BY MR. CUSACK:

Q Dr. Steiner, would you please again refer to Table D-3F? Continuing our discussion on Defendants' Exhibit 55—

A Excuse me. I don't seem to have this at the moment.

Q I'm sorry, sir.

A Just a minute. Yes, I do. I'm sorry.

Q Thank you. In regard to Table D—excuse me—D-1F, which is the chart entitled "Analysis of Sales to Electric Utility of Coal Produced in the Springfield

Freight Rate District," now it is my understanding that the—there are just two utilities, two utility facilities located in what you consider to be the sales area for Springfield, and that is the Coffeen Plant of CIPS, and the Springfield Plant of the Springfield Water Light & Power facility; is that correct?

A Yes, excluding the Commonwealth Edison station that you called to my attention, the Kincaid Station.

[2337] Q Yes, we discussed that already.

Now under column 3, sir, on that page "Springfield Production Sold to Utilities," the column on the right reads "percentage of total production." This is percentage of total production just sold to utilities, isn't it?

Q Yes, sir?

A And it so states.

[2338]Q Now, then, of all the production sold to utilities, 82 percent of it is sold to Commonwealth Edison, is that correct, sir?

A That's correct.

Q Are you familiar with the sales to Commonwealth Edison in 1967 from the Springfield Freight Rate District?

A I am not sure of the sense in which you mean that. I know there were 7.5 million tons.

Q Well, is it fair to say that you know that approximately 5.5 million of those tons were consumed at the Kincaid power station of Commonwealth Edison?

A A very large quantity was. I don't remember the precise percentage.

Q And the Kincaid station is located, is it not, approximately 30 miles south of Springfield?

A I don't know the precise location. It is very close to Springfield.

Q You recall the testimony of Mr. Corey, do you not, sir, in regard to when the Kincaid station was built?

A Perhaps you would remind me.

Q I believe he testified that it was completed, I think, in 1963 or 1964.

MR. CUSACK: Correct me if I am wrong, but I believe it was in the 1960's.

[2339] MR. HEDLUND: I believe the record will

show what it shows. I do not recall. If you want me to take the time to go into Mr. Corey's testimony, I will be happy to.

BY MR. CUSACK:

Q Let us asume, Dr. Steiner, that the Kincaid station was built between 1960 and 1965. Evidence in the record shows that the Mine No. 10 of Peabody Coal Company was built in the early 1950's.

Do you know where the production of Mine No. 10 went prior to the construction of the Kincaid plant in the 1960's?

[2340] A No, I do not.

Q You do not know, do you, that the coal moved on the Chicago and Illinois Midland through Springfield, through Menard County, up to Havana and then by barge to the stations of Commonwealth Edison on the river?

A No. I do not know that. It does not surprise me. I know that Springfield coal has gone to the river and has gone up the river.

Q For many years it is not true that Commonwealth Edison stations in the Chicago area purchased coal produced in the Springfield Freight Rate District?

A I believe Commonwealth has purchased coal in the Springfield District and that this has gone to numbers of their stations.

Q Has this been moved by rail or by barge through Havana, do you know?

A If I recall the testimony, there is at least some place in the record some discussion of some of this going by rail to the river, and I think that must have been at the Havana dock, and sent up the river. There may have been some that went directly by rail as well.

Q You do know, too, do you not, that the Kincaid power station of Commonwealth Edison, located below [2341] Springfield, sends its electricity over high tension wires to the Chicago area?

A I don't know exactly where it sells its electricity. That would not amaze me.

Q You would expect that?

A I didn't say I would expect it. If you say it is so, I would have no reason to contradict your statement that it was so.

Q Your Table D-18 shows that the Commonwealth Edison Company consumed 7,584,000 tons of coal produced in the Springfield Freight Rate District. This would be based, in 1967, from three mines, is that correct, sir?

A I am not in position to tell you how many mines that was from.

Q Do you know of any other mines in the Springfield Freight Rate District, other than the Crown Mine at Farmington and the Peabody Mine at Kincaid, and Peabody No. 10, which is at Pawnee, but is the Kincaid Station?

A Those are the only three that I recall.

[2342] Q And there is another mine on GX Nugent Deposition Exhibit 38 in the Springfield district. It is the Little Dog Mine at Gillespie. You do know, do you not, that that mine is closed?

A I think it was closed in 1967 because of a fire. It is not permanently closed, I think the record shows.

Q Yes, sir. Now, the difference between the coal consumed at the Kincaid plant by Comonwealth Edison and the total Commonwealth Edison production from the Springfield district is shipped, is it not, to Commonwealth Edison's plants in the Chicago area and down the river?

MR. HEDLUND: May I have the question, please?

THE COURT: Read the question.

(Question read by the reporter.)

MR. HEDLUND: I am going to object. I don't believe that question makes sense. I dont' understand it.

THE COURT: I think Commonwealth Edison—you have mixed it up.

MR. CUSACK: All right.

BY MR. CUSACK:

We have established that the Kincaid station of Commonwealth Edison consumes between 5 and 6 million tons of coal. Is that fair to say?

[2343] Or let us assume that it consumes 5 to 6 million tons of coal.

A That is a fair assumption.

Q Very good. Thank you.

Now, then, the remainder of the coal sold to Commonwealth Edison which is produced in the Springfield district moves, does it not, to the other Commonwealth Edison stations?

A It moves to some other Commonwealth Edison stations, yes.

Q Does it move up to Havana? Is this coal shipped to the Havana dock and loaded on barges ?

A I think I testified that I did not know exactly how and where it was shipped. It would not in any way surprise me if it were sent to the Havana station and by barge to a river station of Commonwealth Edison. It would not surprise me either if it turned out it was shipped to some other station. There is a rather complex set of stations, all of whom that burn coal get coal from somewhere. I do not know which station got coal from which mine.

Q What I am trying to elicit is whether or not you recall, and perhaps it would refresh your recollection if I recall to you in the Nugent Deposition testimony that [2344] the Crown mine coal sold to Commonwealth Edison moved on the Chicago & Illinois Midland through Springfield up through Menard County to the dock at Havana, where it was loaded on barges.

Does that refresh your recollection?

A Yes. I remember that. I do not remember whether there was any testimony that other coal from that area moved by another route either to those or to other stations of Commonwealth Edison.

[2345] Q I understand. Thank you.

And we have established, have we not, that the Havana dock is across the river and slightly below it from the Liverpool dock of United Electric, have we not?

A I don't know what you mean by "we have established."

I think it is so located.

Q Well, that is fine. And, of course, you are aware of the fact, are you not, that coal from the—shipped from the Liverpool dock of United Electric, coal produced at the Cuba and Buckhearts Mines does move up the river to the river stations of Commonwealth Edison?

A Yes.

Q Directing your attention, sir, to Table D-28, which is the analysis of sales to non-utility facilities of coal produced in the Springfield Freight Rate District, this exhibit shows, does it not, that there were two industrial accounts which are in the non-utility sales area for the Springfield Freight Rate District; is that true?

[2346] A That's correct.

Q Now perhaps if you could explain this to me, sir, on the overlay chart you have the blue lines for the Springfield District, is that correct, at the center of the map?

A That's correct.

Q And this is a circle, is it not, running from Sangamon County down through Macoupin County, encompassing all of Montgomery County at the eastern part of Shelby County the southeastern part of Macon County, and the southern part of Logan County, doesn't it?

MR. HEDLUND: Your Honor, I'm going to object to this characterization by Mr. Cusack of this, or indeed of that map.

As part of the pre-trial proposed findings of fact we gave a precise geographical location or definition, if you will, of the Springfied non-utility sales area. That was admitted by the Government that this is how we defined it in terms of geography.

The representation here on the map as I understand it, only purports to be a rough general outline of the description that is already in the record as admitted to by the Government.

MR. COURT: Mr. Cusack?

[2347] MR. CUSACK: Well, I want to hurry this up, so I'm not going to look at the finding. I don't even have it handy.

What I'm trying to establish is the general area for the Springfield industrial market.

THE COURT: For the purpose of the record will you accept the areas as defined by the defendants here, with this being a rough approximation?

MR. CUSACK: Yes, as what they purport to be their area, yes.

THE COURT: Yes?
MR. CUSACK: Yes, I will, sure.
THE COURT: Proceed.

BY MR. CUSACK:

Q Based on the Springfield industrial market, have I given a rough approximation in reference to your overlay map?

BY THE WITNESS:

A Well, I have not prepared the maps, nor have I checked them that closely.

I believe that that area includes both of the facilities that are here listed, and that that area as drawn approximates the area as more precisely described in the definitions.

[2348] Q Doctor, my point is this: How can this include an area surrounding the City of Springfield, encompassing large portions of Sangamon, Macoupin, and Montgomery, Christian, Macon, and Logan Counties, and Shelby County, when in fact Table D-2S sets forth only two industrial plants, both of which are located in Decatur?

A Well, I don't know the precise locations of these facilities.

If you want to say to me that there are other facilities in that enclosed area that we have neglected to include, that would seem to me to be a serious deficiency.

When we drew the strip up and down the river, we drew a strip of some thickness, instead of just a line reflecting the river stations.

I think that if what you are saying to me is that the diameter of that circle is too wide then the person that prepared the chart, you know, may be called to be asked why he did that.

I think that what was of concern and of interest there was those industrial facilities which we see here accounted for 93 percent of these non-utility sales from that area, and which accounted [2349] for 83 percent of the purchases of those units. The kind of overlap I spoke of is suggesting a market that they are contained in an area,

rather narrowly circumscribed around the City of Springfield, and that is what this chart says to me. And I believe that is substantially correct.

I believe you are now suggesting that perhaps that area should have been drawn as a smaller circle. And that may well be the case. I do not defend the drafting. I defend the general impression of that as a distinct area that does not overlap with these others.

[2350] Q What I am suggesting, Professor, and I would like to ask you, is it fair to set up a non-utility sales area when it involves sales to two industrial companies, the A. E. Staley Company and Caterpillar Tractor Company, both having facilities located at Decatur in Macon County, Illinois?

A Let me again describe the criterion which were used to try and establish these markets.

The notion was that we would take, try and find, if we could, customers who together consumed a large fraction of the coal produced in that area.

Now, here, taking in this entire Springfield production of all the coal that was sold to non-utilities, 93 percent of that coal went to these two companies, to A. E. Staley and Caterpillar Tractor.

Q Do you mean 83 percent?

A I believe the figure I have says that of the Springfield production—I'm looking at now part 3—of the Springfield production, 93 percent of the non-utility production was sold to the non-utilities in this area, only 7 percent was sold to other non-utilities, and that was in the Greater Chicago Air Control Quality District, Control Region.

At the same time not only did these two [2351] facilities, these two facilities of Staley and Caterpillar account for the great bulk of the non-utility production, but at the same time those facilities got the overwhelming majority of their coal needs supplied by that area.

So it was this 2-way relationship, reciprocal relationship that helped us to define the market in general.

That was the strategy. It was not saying, "Where does the coal go?" It was saying, "Can we find people who buy the coal and take a large part of the coal from that

area, and also account for a large part of their purchases from that area?"

Q Dr. Steiner—

A Thus it might indeed be—I can visualize the situation from where you would have one facility that was buying most of the coal produced in an area, and that was getting all of its coal for that area.

It is not the number of companies that are necessary; it is the fraction of the total coal bought and sold that is at issue.

Q The fraction of the total coal produced is important, is it not?

A I think I just said that I thought it was.

[2352] Q All right, Professor Steiner, look at Table D-1S. This states that the Ceneral Illinois Public Service Company plant at Coffeen and the Springfield Water, Light & Power plant at Springfield consumed in 1967, 1,489,000 tons of coal; is that correct, sir?

A That's correct.

Q And Table D-2S states that the A. E. Staley Company of Decatur, and Caterpillar Tractor at Decatur consumed 344,000 tons of coal in 1967 produced in the Springfield freight rate district; is that correct?

A I believe that is correct, yes.

Q The next table, Table D-3S, shows that the—adding together these two previous figures, which is under the title "Springfield Production Consumed by All Facilities in Sales Area" amounted to 1,833,000 Tons of Coal; is that correct?

A Are you asking me to check the arithmetic?

Q Is that what this purports to show?

A I believe that is what it says.

[2353] Q And isn't it a fact, sir, that this 1,833,000 tons of coal is only 19 percent of the total coal production in 1967 of the Springfield Freight Rate District, which according to Table D-3S amounted to 9,649,000 tons of coal?

A Yes, that is so. And that is shown precisely on that same page. That is at the bottom, under part 2 of the page, we show both that total production and that percentage distribution.

Of that production 19 percent went to these facilities, utility and non-utility.

Another 79 percent went to Commonwealth Edison, of which, as you pointed out to me, over 5 million, 5½ million was also in that geographic area.

The other was to other stations.

And 2 percent represents 232,000 tons, which was sold to all other facilities.

Q Wherever located?

A Wherever they may be. I think we can identify those, if—

Q Professor, on that last page, Table D-8S, the recapitulation of the Springfield sales, you have 70,000 tons coming into your area from Mineral-Atkinson; [2354] is that correct, sir?

A That's correct.

Q Do you know where that is located?

A I believe that is north of Fulton-Peoria, and northeast, I believe—no, I believe it is—my general impression is that Mineral—it is in the north part of the state. I don't remember its precise—

Q Atkinson is in Henry County?

A Yes.

Q Which is north of Fulton-Peoria?

A That's correct.

Q Directing your attention, sir, to Table D-1B, the chart entitled "Analysis of Sales to Electric Utilities of Coal Produced in the Belleville Freight Rate District," under numbered paragraph 2, sir, coal consumption by utility facilities located in the Belleville sales area shows, does it not, sir, that in the area designated by the defendants as the Belleville sales area for utility facilities, 918,000 tons of coal moves into this area, which coal is produced in the Southern Illinois Freight Rate District; is that correct?

A That's correct.

Q And 436,000 tons of coal consumed in your [2355] area moves from mines produced in the western Kentucky field; is that correct?

A That's correct.

Q And 429,000 tons of coal is from the Mineral-Atkinson area; is that correct?

A That's correct.

[2356] Q And 62,000 tons are from the Springfield district, is that correct, sir?

A That's correct.

Q In other words, 21 percent of the coal consumed in what the defendants have designated as their Belleville sales area for utility facilities is produced in other freight rate districts?

A That is precisely, it seems to me, what the table, Table D-1B, says. It says approximately 80 percent is produced in the Belleville area and 21 percent is produced in these other areas.

Q Again, sir, discussing Commonwealth Edison Company, are you aware of the coal produced by the Captain Mine of Southwestern Illinois Coal Corporation?

A Yes, I am.

Q Which coal moves on the Gulf, Mobile & Ohio Railroad Company, through Springfield, Illinois, to the Will County station of Commonwealth Edison Company?

A Yes. Would you like me to speak generally on the problem of Commonwealth Edison and its coal purchases?

Q No. I will go into that later, if I may, with leave of the Court.

THE COURT: You may.

BY THE WITNESS:

A Well, I think—

[2357] THE COURT: Answer the question. Is there a question?

THE WITNESS: Am I aware of it? Is that the question?

BY MR. CUSACK:

Q Yes.

A Yes, I am aware.

Q You are also aware that it moves through Springfield, Illinois, on the GM&O and then north to Will County?

A I was not aware of the precise routing of that coal.

MR. CUSACK: Will counsel so stipulate, that the coal on the Gulf, Mobile & Ohio Railroad moving from the Captain Mine of Southwestern Illinois Coal Corporation moves on the Gulf, Mobile & Ohio through Springfield and north to Will County?

MR. HEDLUND: Yes, if counsel will stipulate that this is a unit train movement in a train that never stops.

MR. CUSACK: I will stipulate it is a unit train movement. I don't know whether the train stops.

THE COURT: I think that is a fair assumption. Will you accept that condition?

MR. HEDLUND: I need not mean to say that it didn't stop to unload. What I meant to say was that that was [2358] the only reason that it stopped. It is a continual movement, your Honor.

THE COURT: All right.

[2359] BY MR. CUSACK:

Q I have forgotten one thing, Professor. The first page of Table D-1B—we were discussing your Belleville District, consuming district, and we found out that 918,000 tons sold in this district comes from the Southern Illinois District. This excludes, does it not, 970,000 tons of dust produced by coal mines in the Southern Illinois District, does it not?

A Again, if I may disclaim it being my exhibit, the footnote says it excludes that dust. I have no reason to think the footnote and therefore the exhibit is wrong.

Q I understand. Thank you.

Now directing your attention to Table D-1B, continuing on the second page of that, sir, it is fair to say, then, that 6,526,000 tons of coal produced in the Belleville Freight Rate District in 1967 was sold to Commonwealth Edison Company, is that correct?

A That is what the table says, yes.

Q Which is 40 percent of the total production sold to utilities, is that correct?

A That's correct.

Q And this coal is not consumed at the Powertown [2360] Station of Commonwealth or at the Kincaid Station, but is consumed at the river stations of Commonwealth Edison Company, isn't it?

A I do not have at my fingertips the precise destination of that coal. I think that must be the same coal you were talking about a moment ago that went on this unit train, the train shipment; which facility or facilities consumes that I do not remember.

MR. HEDLUND: I might add, your Honor, this is all in the record.

BY MR. CUSACK:

Q Directing your attention to Table D-B2, is it a fair statement that 24 percent of the coal produced in the Belleville District sold to the non-utilities is sold in the Greater Chicago Air Control Region?

A That is what this table shows, yes.

Q So that coal moves from the Belleville District, which is directly to the west and slightly to the north of the Southern Illinois District, to the Chicago area?

A That's correct.

[2361] Q Looking at Table D-3B, the recapitulation, it is a fact, is it not, that 46 percent of the coal produced in the Belleville freight rate district in 1967 was sold either to Commonwealth Edison Company or to facilities located in the Greater Chicago Air Quality Control Region?

A Yes.

Q In regard to Table D-1SO, which is entitled "Analysis of sales to electric utilities of coal produced in the Southern Illinois Freight Rate District," there is a listing, is there not, here, sir, of the utility facilities located in your southern sales area?

A In the southern sales area.

Q This is based on 1967 coal production, sir, is it?

A That is my understanding throughout this whole exhibit.

Q None of the coal in this area, as far as this exhibit shows, moved to any of the facilities of the Union Electric Company, is that correct, sir?

A No. I believe Union Electric Company is listed in the facilities.

Q Excuse me. Yes. Well, then, would Union Electric service area be part of your southern Illinois district? [2362] A I think that the Union Electric facility, the Sioux facility at West Alton and St. Charles, if I read this correctly, in Missouri, is included in that district, yes.

I think there are a number of facilities of Union Electric, and it is that facility—again, I don't have a terribly good memory, but it seems to me that is a rail facility that sends coal by rail from southern Illinois to that facility as distinct from other facilities of Union Electric which receives barge coal from the Belleville area.

Q And the Belleville area traditionally, does it not, serves the mines of the Union Electric Company—excuse me,—serves the generating stations of Union Electric?

A Some of them.

Q You know, do you not, that the Orient mines of Freeman in the Southern Illinois Freight Rate District now have a contract to supply the Sioux plant at Alton, isn't that correct?

A I am not sure if that is correct or not. There are so many sales data I have forgotten, and I am embarrased to say that is one of them.

Q I believe Mr. Nugent testified in his deposi- [2363] tion on it—

A If he so testified, I am sure that is correct.

Q The Table D-1SO is continued on the second page, and on the second page you have sales to utilities in your sales area amounting to 7,987,000 tons, and then sold to Commonwealth Edison, 137,000 tons, and you have sold to other utilities 1,714,000 tons.

Do you know, sir, which other utilities this would be referring to?

A I think I have a list of them, if I may look at it. [2364] MR. HEDLUND: Your Honor, in the interest of time, we would be more than happy to put into the record that list.

THE WITNESS: There are large lists of these.

BY MR. CUSACK:

Q Would you please read them off? It might expedite this, your Honor. I wouldn't have to go into it any further.

THE COURT: Mr. Hedlund agrees to stipulate that whatever is on the list, showing whom they are sold to, will be incorporated in and will be made a part of the record, unless you want to have it read off.

MR. CUSACK: There are about ten names, your Honor.

THE COURT: All right.

BY MR. CUSACK:

Q Would you answer?

A I think one of the problems is that that 1,714,000 tons of coal will divide into two parts. The list I have here is 946,000 tons of coal that are sold to facilities which I will be glad to read, if you like, that are in none of the four sales districts. There are other facilities—this coal has appeared elsewhere. You will recall there is some Southern [2365] Illinois coal that went to some customers who were in other districts.

Q Yes.

A I do not have that specific list, but I can give you the list of about 946,000 of those tons.

Q Fine.

A If I can read you this, I think some of those sales went to American Electric Power in Mishawaka, Indiana; some to Central Illinois Public Service Company in Huntsville, Illinois.

Q Do you know where Huntsville is located?

A Well—

Q Never mind.

A No, I don't.

Q Go on.

A Some of that coal—this is utility coal.

Q Yes, sir.

A Some went to Illinois Power at Vermillion-Oakwood, Illinois. A substantial amount went to the Clifty

Creek facility. That was that Ohio—Mr. Ward, was it, who testified to that facility that provided power to the Atomic Energy Commission. Clifty Creek, Indiana.

Q Is that in southern Indiana?

[2366] A I believe it is in southern Indiana or conceivably in Kentucky. I think it is on the Ohio River. Some of that went to Rochester Public Utility, in Rochester, Minnesota; some went to something which I don't know, called the Rochelle Light & Power in Rochelle, Illinois, which is perhaps a municipal plant.

A substantial amount—well, not substantial—some amount went TVA in Johnsonville, Tennessee.

Q How much would that be?

A In this list that is 68,000 tons. Some went to Wisconsin Power & Light in Beloit, Wisconsin.

Q How many tons was that?

A That is a small shipment, 22,000 tons.

But these details are available in the printouts. This is a hand tabulation of some of that tonnage, because I was curious to see where in fact it did go. It goes to a variety of the locations.

[2367] Q In Indiana, Wisconsin, Illinois and Minnesota, right?

A Tennessee, Kentucky. Kentucky, I think, is to something called Louisville Gas Company. A variety of locations. This southern Illinois coal goes to a lot of places.

Q Just for purposes of the record, the Clify Creek facility in Indiana gets 207,000 tons, is that correct?

A That is what this says.

Q And the Huntsville plant gets 253,000 tons, is that correct?

A That is what this says.

Q And the Mishawaka, Indiana, facility of American Electric Power gets 69,000 tons, is that correct?

A That's correct.

I think Clifty is called the Ohio Valley Electric Association. That is, the operator of the Clifty Creek plant.

Q In regard to the recapitulation, Table D-3SO, this shows, does it not, that all the coal consumed by all

facilities in what is purported to be the southern sales area—of that 42 percent of this coal is produced in west Kentucky, Mineral Atkinson, Belleville, Indiana, [2368] Murdock, Springfield, and Fulton-Peoria, in total?

A I think a negligible amount in Springfield and Fulton-Peoria. Most of that, 34 percent, is from west Kentucky.

May I say that from all of these areas, the one that was least satisfactory, in a kind of reciprocal analysis that I wanted, was the Southern Illinois area. It is clear there is a great deal of overlap between southern Illinois and west Kentucky. A lot of that coal goes into west Kentucky, partly because it goes to TVA stations in the west Kentucky area.

So I am not sure, if I were drawing it, that I wouldn't think of a market area that merged some west Kentucky with some southern Illinois. The west Kentucky fields seem to have a substantial overlap.

Q You have testified that the west Kentucky field, the west Kentucky sales area, I mean, is in Wisconsin, is that correct?

A No, sir.

Q Excuse me. Strike that. You testified that the southern Illinois sales area is in this eastern portion of Wisconsin, is that correct?

A Southern Illinois coal is heavily concentrated in three areas. One area is that northeastern section of [2369] Wisconsin, the blue wedge. Another section is west of the Mississippi River, that large blue balloon. A third area is down in that tri-state area, TVA, which includes Cape Girardeau. We can look at the facilities by name. Particularly in that area, as you can see, which involves Missouri, Indiana, Illinois, in that corner, that four-state area, west Kentucky coal goes into many of those same facilities.

It is that fact, I think, which results in all of these areas we have looked at, where the southern production consumed by the southern area, in the sales areas only, accounts for 56 percent, as you have pointed out—I thought perhaps it was 58, but I am not sure—I think it is 56 percent of the consumption of the facilities in

this sales area comes from there. The rest come in great bulk from west Kentucky.

I believe there is just a mistake in addition on that table.

Q Which one is that?

A I believe where it says 42 percent, it should be 44 percent.

[2370] Q On Table D-3SO?

A That's correct. I think the 56 percent is correct. I think the sub-totals are correct—34, 8, 3 and 1. But I think that adds up to 44 percent.

MR. CUSACK: Will counsel stipulate to that correction?

MR. HEDLUND: We certainly will.

THE COURT: All right.

MR. CUSACK: And may the chart so show?

BY MR. CUSACK:

Q In other words, you have 44 percent from the other producing districts and 56 percent from southern Illinois?

A That is correct. But I think that unless one recognizes that 34 of the 44 is from west Kentucky, one—the real question, and the question I confess I had and still have, is whether one should have defined instead a combined southern Illinois—west Kentucky area for this utility, for the purpose of these utilities.

Q Would you have defined a combined southern Illinois and Fulton-Peoria district?

A Southern Illinois and Fulton-Peoria?

Q Yes, sir.

A No, I would not.

• • • •

[2376] Q And Commonwealth Edison Company, does it not, sir, have coal-fired generating stations located south of Springfield, south of Peoria, at Dixon, Rockford, Will County, near Joliet, Waukegan, Chicago, and on the Illinois-Indiana border at State Line; is that correct?

A They have a number of facilities. I think the record will show where they are.

Those dots on the map purport to indicate the major collections of them.

Q So it is your view then that Commonwealth Edison Company no matter where its stations are located, is the separate geographic market; is that correct?

A I think you are trying to put words in my mouth.

I think that the Commonwealth Edison Company, by virtue of the quantity of coal it purchases for its power stations and the particular problem it has, and the problem it has of getting enough coal for each of its coal-fired stations is better considered as a separate market than being lumped in with some of these other markets.

[2377] Q And is it a separate market, sir, because of its size?

A Well, I think that size is one of the things that makes it sensible to treat it separately.

I suggested that its heavy involvement in nuclear energy was the second reason perhaps why it might make sense to treat it separately.

Q Based on your professional experience—

MR. HEDLUND: Just a moment. I'm not certain that the witness was finished with his answer.

THE COURT: Did you finish your answer?

THE WITNESS: Not quite.

THE COURT: All right, continue.

MR. CUSACK: Excuse me.

BY THE WITNESS:

A I think I was saying that it's particular concern with nuclear energy, and its particular sensitivity to the air pollution pressures that at least are partly responsible for its interest in sources of energy other than coal, all of these things make it a rather distinctive case, and one that it seems to me sensible to treat as a separate economic market.

* * * *

[2380] A I think one can think of numbers of situations [2381] in which the presence of a dominant firm so affects the whole picture of the way in which an industry behaves that it may be sensible to treat it separately.

Again I want to talk as an economist, and not as what I am not, not a lawyer. I'm trying to remember—

I have just the faintest glimmer that in one of the California bank cases there was some discussion of treating the market absent Bank of America on the grounds that Bank America with its multiple branches was so large a factor that to include it would distort the picture.

[2382] Q Do you—

A But there are various situations, cases in which—the Shoe Machinery is one in which a single firm was held so to dominate an industry that to treat it as if it were a separate force seemed appropriate. I think there is no rule here as to what makes better sense. One asks, really, whether separating or combining a particular dominant firm—in this case a dominant coal purchaser with others—but in a situation where the combining the firm with others provides more insight than keeping it separate.

Here it seems to me that keeping Commonwealth Edison Company as a purchaser of fuel separate from the other utilities in this area makes more sense than to combine it.

Q Well, Professor, the Shoe Machinery case was Section 2, Sherman Act monopoly case, wasn't it?

MR. HEDLUND: I object.

BY THE WITNESS:

A I was not talking—I'm sorry.

I was not talking to the legal aspects. You asked me as an economist did I think it made sense.

There are people who manufacture these machines.

* * * *

[2384] I think that this kind of area of division which I have testified to, which seems to me a sensible solution, that their mines are in largely non-closely competitive producting districts. I think in one sense, [2385] of course, all producers of energy are in an energy market. Both of these coal companies, along with other companies, are concerned with supplying energy.

I think that in terms of the question that I believe is of central concern, these companies are very largely not in close and direct competition for particular customers with a significant exception of Commonwealth Edison.

Q Concluding with some questions—concluding my questions on DX-55, I just have a few more to ask you.

DX-55 is just for 1967; that is correct, isn't it?

A That is my understanding.

Q Dr. Steiner, is it fair to construct any sort of a geographic market or markets based on data for only one year?

A It is better than data for no years.

I think what you—

Q I believe you have answered the question. Thank you.

You have ignored, have you not, in DX-55—your Honor, may I confer with my counsel on the Elm mine situation?

THE COURT: You may. You may.

* * * *

[2387] THE CLERK: Case on trial.

THE COURT: Are you ready to proceed?

MR. CUSACK: Yes.

Your Honor, we have a stipulation based upon examination of the Morrison and Abrahamson deposition. Based upon those, we stipulate that the new unit at the Edgewater Utility at Sheboygan, Wisconsin, the largest coal-fired unit in the State of Wisconsin, owned by Wisconsin Power & Light and Wisconsin Public Service Company, will receive by unit train in utility-owned cars costing $16,000 each up to one million tons per year for 15 years with a ten-year option, with Peabody Coal Company, for coal to come originally from Fulton County, Illinois.

THE COURT: Is it so stipulated?

MR. HEDLUND: We so stipulate that that is what the record shows.

THE COURT: All right.

BY MR. CUSACK:

Q Now, Professor, based on that stipulation and based on your prior discussion of DX-55 and your construction of markets on that basis, you have, have you not, not taken into consideration that stipulation which we have just stated?

[2388] A Obviously—

MR. HEDLUND: I'm going to object to the phrasing of that question on this basis: This data was 1967; this refers to something following that period. With that

understanding, I would not object to the question.

THE COURT: Is that agreeable?

MR. CUSACK: Yes, your Honor.

BY THE WITNESS:

A This sounds to me, Mr. Cusack, like one of those things that the record suggests is possible, where a facility is geared to a mine and a rail shipment. If I understand that stipulation, and I heard it just once, one has here a facility that is built—

[2389] MR. CUSACK: Your Honor, I request that the witness answer the question.

BY MR. CUSACK:

Q My question, and I will rephrase it if you want me to, and with the permission of the Court—

THE COURT: You may.

BY MR. CUSACK:

Q Your DX-55, sir, does not take into account any shipments after 1967.

A That is correct.

Q And your DX-55, sir, does not take into account any shipments prior to 1967, isn't that correct?

A DX-55 is based on 1967 data.

Q And you also have ignored, even in 1967, sir, the production of the Mecco mine of Peabody, which in that year produced 1,248,000 tons of coal; isn't that correct?

A I don't know that that is correct.

Q As shown by Kolbe Deposition Exhibit 19.

MR. CUSACK: Will counsel so stipulate, that DX-55 does not take into account the production of the Mecco mine of Peabody?

• • • •

[2396] Q Is it possible, sir, to define any geographic market for the sale and distribution of any product, or even need for the production of any product with much exactitude?

A I have heard your question, but I don't believe I understand it.

I think there is some approximations to markets, some estimates attempted to delineate them that seem to me more sensible, more accurate than others.

I do not think, except in very rare cases, one would be able to define a perfect market definition that meets everyone's criterion of what was desired. But I think there are reasonable approximations, and one does the best one can.

Q Is it possible, sir, that by limiting data selection to a single year to arrive at a distorted picture of the market?

A Are you asking me if it is possible to deliberately distort a market by limiting attention to a single year?

Q No, sir, not "deliberately" at all.

A Are you asking me if the data for a particular year might possibly be quite different in another year?

The answer, of course, is that they might be.

[2397] I have no reason to think that these data are particularly a biased selection of year.

I think, as an economist, I would have been very pleased to see the same data collected year by year for 40 years, and we could have traced the way in which the markets change.

I do not, within the context of what you would call reasonable estimations, whether taken from the customers' statistics or producer statistics, which I understand were collected in the same discovery procedure, I don't think that either one of those sets are inherently suspect because they are of a single year. I think there is a great deal of information in the testimony that we have heard in this case, there seems to be substantial stability in coal buying partly because of long-term contracts, in part because of repetitive attempts to get coal from particular areas by particular utilities.

MR. CUSACK: May I have a conference with the witness on Defendants' Deposition Exhibit No. 36?

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

• • • •

[2411] For me to go further and to say that these [2412] mines are with respect to most of their customers or with respect to a substantial number of customers, a very substantial fraction of all customers, in the same market is a very different question.

I have in mind here that I could visualize two quite separate markets that had an area of overlap. In that area of overlap a customer located in that area of overlap might well be reached from either one of the separate markets. That would not, by virtue of finding that overlap, suggest that there was a total identity of the two markets.

Q Is it true that a coal consumer might negotiate with a number of coal producers before locating a coal consuming facility?

A I think it is not only possible; I think the record shows that this has happened.

Q In such a case, then, the location of this facility would not reflect the actual competition between coal suppliers that occurred before that facility was located there, isn't that true?

A May I have that question?

THE COURT: Read the question.

(Question read by the reporter.)

[2413] BY THE WITNESS:

A No. I think it would reflect it. I think that a customer attempting to locate a facility, considering several possibilities in terms of different coals or several possibilities including different fuels, would consider the site of what it considered the possible and relevant suppliers, and I think, having once chosen one, that what that would suggest is that he found that particular supplier in that particular location to be the economically best solution for him as of the moment of that decision.

In that sense, it seems to me it does not, and perhaps this is what you had in mind, show by itself which alternatives he considered; but it shows which alternatives he selected.

MR. CUSACK: May I confer with my colleagues for a moment?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

* * * *

[2423] REDIRECT EXAMINATION

BY MR. HEDLUND:

Q There was reference in your cross examination both with respect to—well, particularly with respect to Commonwealth Edison.

I would like to ask you to assume that the coal at a mine in Fulton County has a higher BTU than coal from the Springfield Freight Rate District, and I would like to ask you—I would ask you to assume that this coal from Fulton County to a dock opposite Havana costs about 10 cents or so per ton to deliver it to that dock; and I would like you to assume that the freight rate from the mine in the Springfield District was 85 cents or thereabouts to the Havana dock, and that beyond the Havana dock to the river stations of Commonwealth Edison the barge rate is the same.

Then I would like you to assume that Commonwealth Edison has purchased coal from both such mines to burn in the same stations.

First of all I would like to ask you if you can conclude why they do that, and if you would have an explanation for it?

A If I understand the figures you gave me the coal from Springfield is 75 cents more expensive in terms of shipment, and is, at the same time, a somewhat low BTU per ton. That suggests—is that correct?

[2424] Q That's correct. And I believe—well, yes, that is correct.

Just for purposes of reference, I believe Mr. Nugent said that 100 BTU differences is worth about a nickel a ton.

A Clearly in that case, if that station of Commonwealth Edison were in a position to acquire all of its

supplies—I also assume that there are no other differences in the coals that we haven't specified?

Q That's right.

A I would assume that if they are in a position to acquire of its coal from that facility, from the Peoria-Fulton District, it would have done so; it would have saved transportation costs, and gotten more energy per ton as well.

I would conclude, I think, that it went to the more expensive source of coal because it simply could not satisfy all of its requirements at the lower price from the Fulton-Peoria area, that because of its total demands it needed more coal than it could get in one area, and therefore that it had been pushed into acquiring a secondary source of coal for that plant.

Q Mr. Cusack inquired about everything else being equal would not a coal customer prefer to [2425] purchase coal from a mine closer to it than one farther away.

Is it always true as a principle of economic theory that what one might intuitively expect to be the most economic purchase in a situation where proximity is important, that one would expect to go to the closest facility rather than the fartherest facility, that intuitively you would expect that, but when you analyze it that the opposite is true from an economic standpoint?

A That is a well-known theorem. It is called the transportation problem in economic theory, a problem that is—perhaps I can illustrate it this way:

If a company has, let us say, three producing locations and ten selling locations, its problem is to decide which plant in each case ships to which selling location, so as to get the right quantity of output at each selling location in such a way as to minimize its total freight rate.

Now that turns out to be an involved program in something called linear programming. It is a problem that has been solved as a practical matter for large companies in part because of the [2426] introduction of computers.

Kimberly-Clark is one example that I know of that utilizes now this kind of analytical scheme to figure out

what is the best way in which the supply from the various factories goes to various distribution points.

In this connection, for example, it is quite possible that if, let us say, Commonwealth Edison has one station near Chicago and another near Springfield, and it needs coal both from the Springfield area and from the southern Illinois area, or from the Belleville area, let's say, it might be efficient in terms of minimizing its total coal bill to ship coal from right next to the Springfield plant to the Chicago area, and coal from Belleville to the Springfield plant.

I take that as a purely hypothetical thing.

What one is concerned with in this case is allocating a number of shipments from a number of sources of supply to a number of facilities in such a way as to minimize the aggregate transportation costs. And that turns out, by the way, to be a tremendously difficult problem to set up and solve analytically, even with the aid of modern mathematical models and [2427] moderate size computers. This is done quite routinely for a number of different enterprises. I have no idea if Commonwealth Edison uses that sort of technique in analyzing its fuel costs, but it wouldn't surprise me if it did.

* * * *

[2428] Q Mr. Cusack asked you, or made reference to your discussion of the coal industry in your textbook. [2429] Is there a difference between an industry and a market?

A It is a distinction that is usually made to refer to an industry as a—some description of a set of producers, and thus the standard industrial classification involves a great many—either in terms of a set of producers, or in terms of a specified product, a product like coal.

There is a coal industry in the statistical sense. There are a set of producers who produce coal who have, as Mr. Cusack reminded me, publications and trade associations and that sort of thing.

Having said that, we have not yet come to the question which I talked about at some length—was it yesterday—as to the definition of a market for the purpose of

analyzing a particular question that occurred in a market.

Competition occurs in a market.

Production occurs in an industry.

MR. HEDLUND: May I have just one moment, your Honor?

THE COURT: You may.

(There was a short interruption, after which the following further proceedings were had herein, to-wit:)

* * * *

[2437] THE COURT: Now, in your analysis of the coal industry as we find it here in illinois and as posed by all of the facts that have come in in this case, is there anything about it that does not make it susceptible to the same criteria in judging the competitiveness of the market as it does in industry in general, that is, the industries that you have studied?

THE WITNESS: I think the same kinds of considerations pertain. I think there are some specific differences. I think in this case what seems to me the importance of reserves as distinct from production is an index of strength. I think that the great importance of physically very different competitive products, like nuclear energy, is somewhat a special feature. But not in principle different.

I think that the fact that the coal industry in some senses is fighting for its life with this air pollution thing gives some different overtones to the general problem of the set of pressures that faces them.

I think the fact that this is an industry that sells almost all of its products to very large, [2438] very well informed buyers, importantly conditions the way in which this competition occurs.

I think all of those things also are present in more or less degree in other industries. I think here again something that is important just because it plays such a large role in this case is the tremendous importance of transportation costs. The greater the transportation costs as a function of total delivered price, the more important it is to look at location and transportation routes in determining which sellers are generally in competition

with others, so that I suppose my general answer is you always, when you get down to the nitty-gritty of it, have to look at the details of the particular situation, and I must say in this case my opinions about the coal industry have been changed very much by looking at the data in the record.

[2439] I started out thinking that coal was an industry of lots of small producers and that it was a dying industry. I have changed that view very substantially in the course of this. I don't know if that answers your question.

THE COURT: That answers the question. Are there any questions as a result of mine? Mr. Hedlund?

MR. HEDLUND: Yes, your Honor. Just one.

BY MR. HEDLUND:

Q Are there many industries with which you are familiar, Professor Steiner, where the type of buying in terms of long-term contracts is as prevalent as it is in the coal industry?

A Not many. I think when electric utilities, to take another situation, buy steam turbine generators, they are buying in effect long-term delivery of services. Heavy equipment, and this sort of thing is of course buying a stream of services over many years.

But I think any place where you have purchasing of very expensive either supplies in terms of this kind of long-term supply contract or in terms of equipment, which after all is providing services over a long period, has this kind of importance to buying. I think it is no coincidence in electric power that the [2440] same executives frequently—Philip Sporn, for example, who has testified, does the coal buying and also, I understand, does most of the heavy equipment buying, or he did when he was president of AEP.

THE COURT: Any questions, Mr. Cusack, as a result of mine?

MR. CUSACK: Perhaps one.

RECROSS EXAMINATION

BY MR. CUSACK:

Q Would you analogize the steel industry with the coal industry?

A In what dimensions, Mr. Cusack? Surely there are some similarities. There are some tremendous differences.

Q In regard to freight rates and freight costs.

A I think steel is a purchaser and requires large quantities of both coal and iron ore. It is therefore heavily influenced by that. It is different in that complicated steel products and steel products unfabricated carry a much heavier, higher, unit value than coal.

When you are talking about a ton of steel, you are talking about well over a hundred dollars a ton as the value of that shipment. You can support [2441] a good deal more freight rate with that than you are talking about when you talk about a commodity that bears a value of five or six or even in the case of metallurgical at ten or twelve dollars a ton.

So they are similar in some respects and different in others.

* * * *

[2445]

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

UNITED STATES OF AMERICA, PLAINTIFF

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, DEFENDANTS.

Before the HON. EDWIN A. ROBSON, Chief Judge

Wednesday, April 22, 1970

12:20 o'clock a.m.

PRESENT:

MR. JOHN THOMAS CUSACK,
MR. ROBERT L. EISEN,
MR. RONALD L. FUTTERMAN, and
MR. RICHARD J. BRAUN,

appeared for Plaintiff;

MR. REUBEN L. HEDLUND,
MR. DONALD G. KEMPF, JR., and
MR. RICHARD H. IRVING, III,

appeared for Defendants.

ALSO PRESENT:

DR. PETER STEINER.

[2446] THE CLERK: Case on trial.

THE COURT: Good morning, counsel. Are both sides ready to proceed?

MR. CUSACK: Yes, your Honor.

MR. HEDLUND: Yes, your Honor. I have a preliminary matter.

At this time, your Honor, to the extent I have not done so before, we wish to offer into evidence Defendants' Exhibits 227 through 239, and I will not take the trouble of reading—I have a list that I propose to give to the Court Reporter, if that would be satisfactory.

THE COURT: Any objection?

MR. CUSACK: We have no objection to any of the exhibits except in DX-239. Mr. Futterman has some expertise on that. May we delay our comment on that until I have a chance to confer with him? He is the "239 man."

THE COURT: All right. All exhibits may be admitted into evidence except 239.

(Defendants' Exhibits 227 through 238, previously marked, were received in evidence, a description thereof incorporated in the record herein following, to-wit:)

UNITED STATES v. *GENERAL DYNAMICS, et al.*

67 C 1632

DEFENDANTS' EXHIBITS

(Continued)

DX NO.

227 November 1, 1963 Memorandum from R. H. Inman to R. J. Hepburn re Freeman analysis of Kerr Mine.

228 Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies for September, 1966, pages 4386-4389.

229 Form 250 Response to the Court-Ordered Subpoena Questionnaire for the Freeman Coal Mining Corporation.

230 April 13, 1970 letter from Mr. Allen Van Wyck, Chairman of the Board of Illinois Power Company to Donald G. Kempf, Jr.

231 April 14, 1970 letter from K. E. Bowen, President of Central Illinois Public Service Company, to Donald G. Kempf, Jr.

232 Brochure entitled "Low Cost Electric Power and Dependability . . . Through MAPP".

233 Brochure entitled "Mid-America Interpool Network —MAIN".

234 1969 Annual Report of Illinois Power Company.

235 Article entitled "Shortage of Low-Sulphur Coal Hampers Electric Utilities in Antipollution Efforts," *The Wall Street Journal*, April 6, 1970.

236 April 1, 1970 letter from Marvin O. Young, Vice President and General Counsel for Peabody Coal Company, to Reuben L. Hedlund re coal reserves in McDonough, Schuyler, Adams, Brown and Hancock Counties (Illinois).

237 Series of four tables: (1) "Fraction of Total Illinois Production of Leading Companies Other Than Peabody"; (2) "Average Production Per Company"; (3) "Changes in Concentration in Illinois Coal Production Since 1959"; (4) "Changes in Concentration in Illinois, Indiana, and Western Kentucky Since 1959".

238 Telegram of March 5, 1970 from Stephen F. Dunn, President of the National Coal Association, to the President of the United States re foreign oil imports to Midwestern utilities.

• • • •

[2450] JAMES M. FOLSOM,

called as a witness in rebuttal by the plaintiff herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CUSACK:

Q Please state your full name.

[2451] A James M. Folsom, F-o-l-s-o-m.

Q And what is your home address?

A 2704 Clagary Road, Kingston, Maryland.

Q And what is your position, sir?

A I am an economist of the Federal Trade Commission.

MR. CUSACK: I ask the Court Reporter to mark for identification as Government's Exhibit 140 the vitae on Mr. Folsom, a two-page document.

(The above document was thereupon marked as Government's Exhibit 140 for identification.)

MR. CUSACK: Your Honor, the Government moves the admission in evidence of GX-140.

MR. HEDLUND: We have no objection, your Honor.

THE COURT: It may be admitted.

BY MR. CUSACK:

Q Mr. Folsom, the vitae does not indicate what cases in which you have testified on in regard to your duties at the Federal Trade Commission as an economist. Could you please tell us which cases you have testified on?

BY THE WITNESS:

A Federal Trade Commission v. Sperry & [2452] Hutchinson Corporation.

Federal Trade Commission v. Kennecott Copper Corporation.

Federal Trade Commission v. Allied Chemical Corporation.

Federal Trade Commission v. Papercraft Corporation.

Q Thank you. In regard to this lawsuit, Mr. Folsom, have you been present during this trial?

A Except for one or two hours of one afternoon, I was present during the giving of the evidence.

Q And did you read the transcript of that portion of the trial in which you were not present?

A Yes, I did.

Q And did you read the depositions in this trial?

A Yes, I did.

Q And did you read the deposition exhibits?

A Yes.

Q And did you—

A Excuse me. I did not read completely all of the deposition exhibits; I skimmed the deposition exhibits.

Q Are you familiar with the Government and the defense statistical exhibits in this lawsuit?

[2453] A Yes, I am.

Q Professor Folsom—excuse me. Mr. Folsom, approximately when did you start work on this case?

A I believe it is about two months ago, when I first came to Chicago.

Q Can you give the Court an estimate of the amount of time that you have spent on this case?

A Approximately 300 hours.

Q Sir, based on your examination of the evidence in this caes have you come to any conclusion in regard to competition, if any, between United Electric and Freeman?

A Yes, I have.

[2454] Q And what are those conclusions, sir?

A I conclude that Freeman and UEC were competitors.

Q And can you tell us on what you base that opinion?

A Mr. Camacia, in his deposition, indicated that UEC and Freeman were competitors.

Mr. Nugent, in his deposition, indicated that they were competitors by laying out the areas.

And the statistical exhibits of the Government indicate sales to common facilities, as well as common customers.

Beyond that, one of the defendants' exhibits shows

that Freeman was selling steam coal to Inland Steel in substantial quantities, 90,000 plus tons in 1964, and that UEC was selling steam coal in excess of 30,000 tons to the same customer.

Q And that would be in addition to the information set forth on the common customer charts which is for 1965, 1966, and 1967; is that correct?

A Yes.

Q Based on the evidence in this case, sir, have you come to any conclusions in regard to whether or not coal is, from an economic sense, a separate market?

[2455] A Yes.

Q And what are those conclusions, sir?

A I conclude that coal can appropriately be treated as a sub-market or separate market within the energy field.

Q And on what do you base that opinion, sir?

A A number of things. One, if I may first look at the fossil fuel market—let me begin by saying that there is certainly an energy market. One of the defendants exhibits in this case indicates that there is considerable inter-fuel competition, but that inter-fuel competition is greatest in areas where there are no native fuel resources, such as in New England. There is a specific example that it gives.

Within the midwestern region there are native fuel resources, namely coal in substantial quantities.

Professor Steiner indicated that oil was not a factor in the midwestern markets, during his deposition.

I believe the Steam Electric Plant Factors bears him out in this respect. It shows fossil fuels consumed in Illinois, of which 93 percent was coal by electric generating facilities. In Indiana 97 percent was coal. In west Kentucky 100 percent—excuse me. In Kentucky—west Kentucky is not broken down—in [2456] Kentucky, 100 percent was coal.

One of the Government exhibits indicates that in the—what they call the Eastern Interior Sales Province, I believe 97 percent of the fossil fuels were coal.

This is all for the year 1967.

Further, the evidence in this case indicates that there

is a substantial price differential between coal and gas and fuel—excuse me—residual fuel oil in much of that area.

As you began to get to the fringes of the area, the differential decreases.

The evidence in this case, I believe, indicates that the competition of gas, which is essentially making up the other 7 percent in Illinois, the other 3 percent in Indiana, is of a seasonal nature.

I think, given the seasonal nature of the gas competition that it is appropriate not to include it in a complete analysis of the coal competition.

Witnesses have indicated that the primary competition is the head-to-head competition between coal companies.

If I may address myself to the nuclear question, with the exception of Commonwealth Edison, and of [2457] companies in Minnesota, the far out portions of the Eastern Interior Sales Province, the companies indicated that nuclear was more expensive than was coal.

Further, the evidence in this case indicates that coal—excuse me—that nuclear is not competitive with coal. If the size of the generating unit is 500 megawatts or less, it is not competitive. There is one example of a plant of smaller than that capacity, a 60 megawatt plant which was to have come on line in 1965, but which, according to the deposition testimony is—I believe that is Mr. Abrahamson—is still not on line at the time of his deposition.

[2458] Q Do you recall any comment that Mr. Abrahamson made in regard to his utility's experience with regard to nuclear?

A He was unhappy; I believe, to be exact, he said that they had had a belly-full of the nuclear experience. That is, I think, understandable, given the size of the unit and the delay involved.

Another reason, and my final reason, for considering the coal as a separate line of commerce is that if we look at existing plants, it does not seem feasible from the evidence in this record to convert an existing plant to nuclear. There are some plants which might be converted to other fuels, but nuclear is certainly out in terms of a conversion.

Q Are there any indications to you, other than economic factors, that you have indicated in regard to looking at coal as a separate market? For example, Professor Steiner testified that—

MR. HEDLUND: Your Honor, I am going to object. I think this is getting into an unnecessary leading question.

THE COURT: He has not completed the question. Complete your question.

BY MR. CUSACK:

[2459] Q Professor Steiner indicated that the coal producers had trade associations and had certain publications, and so forth. Is this of any significant factor to you in the recognition of coal as a separate economic product?

A There are a number of organizations which deal with coal as an industry. I do not consider these as important as the price differential from an economic point about which I spoke. As Professor Steiner indicated, either in his deposition or in his testimony before this Court, one of the reasons for segregating a particular commodity and calling that commodity a market by itself would be based on a price differential, and I did see that price differential within the market.

[2460] Q In regard to the feasibility of the cost of nuclear energy, is there anything in the record in that regard from which you could make an estimate of the future extent of the nuclear commitment by the public utilities?

A I don't believe that I can make a good estimate of the future extent of the commitment of public utilities to nuclear beyond what is shown in the record, where you have projections of nuclear orders through 1975 or 1976.

I would say in that regard that this record is fairly clear that any nuclear plant which is going to be in operation before 1976 must have been ordered by this time.

Q Mr. Folsom, Mr. Corey of Commonwealth Edison testified that four of the Commonwealth Edison nuclear

stations were turn-key plants. Does this have any effect, do you think, on the nuclear commitment in particular of Commonwealth Edison, and may it change in the future?

A I don't believe that is in Mr. Corey's testimony. I believe that is in one of the defense exhibits, where they talk about the six—excuse me: seven—nuclear plants. Dresden No. 1, which Mr. Corey referred to in his testimony as a "Model T plant" and then there were four additional nuclear plants. One of the defendants' [2461] exhibits shows that those were ordered at a capital cost of approximately $118 per kilowatt.

Mr. Corey indicated in his testimony that the current capital costs of nuclear are running about $300 per kilowatt.

At the time that those four turn key plants were ordered, the cost of a coal plant was estimated at about $120 per kilowatt. Today, Mr. Corey testified, the cost of a coal plant is in the neighborhood of $220 per kilowatt.

Q When, in your opinion, from an economic standpoint, was there a merger of Freeman and United Electric? Do you have any views on that?

A The question of when there is a merger is, I believe, a legal one. I have an opinion on control and when that occurred. But when the merger occurred, I believe that is a legal question.

[2462] Q When in your opinion, from an economic standpoint, was control achieved over United Electric by the defendants?

A In late 1959.

Q Based on your examination of the record, what in your opinion were the anti-competitive effects, if any, of the control of United Electric by General Dynamics and Freeman.

A One is the structural effect. Both of these firms, the record shows, had been substantial competitors within the coal industry. The record gives a reason for believing that UEC would have continued as a substantial competitor within the coal industry. It might not have done as much strip mining in the future. The record gives some reason for believing that UEC would have gone into underground mining.

There are three things I note prior to 1959 in this respect. One is Mr. Kolbe, in letters written in response to people who inquired as to the interest of UEC in underground reserves—in his first two letters prior to 1966, he stated—

Q Excuse me. That is 1956, isn't it?

* * * *

[2463] Q Is there any other testimony that you recall in the record in regard to the possibility of United Electric going underground if it were not affiliated [2464] with Freeman?

MR. HEDLUND: Your Honor, I did not hear the last part of that question.

THE COURT: Read the last part of that question.

(Record read by the Reporter.)

BY THE WITNESS:

A I recall Mr. Dorrance, I believe is the proper name, in his deposition indicating that Mr. Utterback had told him that UEC was going underground. I do not recall the date of this, hence I hesitate to say this occurred prior to 1959.

Q Mr. Folsom, the defendants contend that the Greater Chicago Air Quality Control Region, which the evidence shows receives coal from Fulton-Peoria, Springfield, Belleville, Southern Illinois, West Kentucky, and Indiana—they contend that the Greater Chicago Air Quality Control Region is, from an economic standpoint, a separate market.

In your view do you believe this is correct?

A No, I do not believe that is correct.

[2465] Q What is the reason for that, sir?

A One, other areas than Chicago are going to have air pollution controls, according to the information in this record. Separating out one market on the basis of air pollution controls does not seem to me to be appropriate.

Q The defendants also contend, Mr. Folsom, that Commonwealth Edison Company at its plants, wherever located, and the record shows that it has major coal-fired

stations at Kincaid, south of Springfield, near Pekin, Dixon, Rockford, Waukegan, State Line, Chicago, and in Will County—that Commonwealth Edison Company is a separate geographic market. Do you have any comments on that?

A Yes. Three reasons are given by the defendants for treating Commonwealth Edison as a separate market. One, the size of Commonwealth Edison; two, the fact that Commonwealth Edison will be affected by air pollution control; and, three, Commonwealth Edison's commitment to nuclear.

I do not believe that it is appropriate from an economic standpoint to separate out a customer on the basis of its size. An analogy: it makes sense in talking, economic sense in talking, about the automotive parts [2466] industry, to talk about the original equipment industry and the replacement equipment industry. To treat General Motors as a separate customer, I do not believe makes economic sense.

Q You mean as a separate customer being a separate market?

A A separate market. It does not make economic sense. Two, in terms of the commitment to nuclear, virtually every utility official who testified either through deposition or from the stand, during the hearings on this matter indicated that they have considered all fuels in making a decision as to which one was the most appropriate. I think they would be derelict in their duty if they did not and that the public service commissions might well call them to task. All except Commonwealth Edison within the Indiana-Illinois area, I believe, indicated they found it much too costly.

Thirdly, in reference to air pollution control, virtually every utility official indicated their concern with air pollution.

Now, if we go to the location of specific plants, many of Commonwealth Edison's plants are located outside of the city limits of Chicago. The newspaper clippings, et cetera, which were put in by the defendants [2467] indicate that Commonwealth Edison's greatest concern is within the city limits of Chicago.

Q As you will recall, Mr. Folsom, the defendants have attempted to set up various geographic markets. They have a geographic market after excluding Commonwealth Edison Company and shipments to the Chicago Air Quality Control Region; they have a geographic market for the Springfield area, for the Belleville area, for the southern Illinois freight rate district, and for the Fulton-Peoria freight rate district.

Based on that, do you have any opinion on whether or not these geographic markets which they have argued for make economic sense?

A Yes, I have an opinion.

[2468] Q And what is that, sir?

A Since I reject the separation of the Chicago Air Control Area and of Commonwealth Edison, these markets do not make any economic sense unless one does completely separate out those areas.

The testimony in this case, as well as the statistical evidence, indicates that a very large quantity of coal, relatively, moves out of each of these districts to other areas primarily to Commonwealth Edison sometimes within the area, or to the Chicago Air Control Region.

Mr. Camicia testified that the majority—usually the majority of the coal is sold outside of the freight rate district in which the mine is located.

Q The Government contends that one of the relevant geographic markets in this lawsuit is what is referred to as the Eastern Interior Coal Province, which is mining districts 9, 10 and 11, what we consider to be a producing area. This is made up of the coal mines located in Illinois, Indiana, and west Kentucky.

Is there any evidence in the record which would indicate to you that the Eastern Interior Coal Province is a proper economic—is a separate economic producing area?

A A separate economic producing area. There [2469] is physical information which indicates that it is a separate producing area. The location of the coal field, and the separation between the coal field in this area and other coal fields indicates that.

There is evidence in the record that this is geologically a coal field.

Q The Government also contends that one of the geographic markets, relevant geographic markets in this case is an area designated as the Eastern Interior Coal Province Sales Area.

What are your views in regard to the validity of the Eastern Interior Coal Province Sales Area as being a proper economic market?

A I did not participate in the drawing up of any of the markets alleged by either the Government or the defendants in this case.

My job was to analyze the markets as contended by the defendants, and by the Government, and from that to decide which was the most appropriate market.

On that basis, I concluded that the State of Illinois was the most appropriate market.

The Eastern Interial Coal Province does seem to be an appropriate market. I, however, have some problems with the Eastern Interior Coal Province, namely, [2470] that coal is expensive to transport.

However, the evidence in this case shows that coal was transported for quite long distances. Mr. Abrahamson of the power company in Wisconsin, I believe, indicated that they have bought coal all over the midwest during the recent shortage.

Mr. Tarzy, who was once in the sales operation of UEC supported the midwest area as a market concept.

Q Would the fact that a high percentage of the coal consumed in the Eastern Interior Coal Province Sales Area was produced in the Eastern Interior Coal Province, that is, Illinois, Indiana and west Kentucky, have a bearing on whether the Eastern Interior Coal Province Sales Area is a proper geographic market?

A It would have a bearing, but it would not be a controlling factor.

The record shows more than 80 percent of the coal produced in the area is consumed in the area, and more than 80 percent of the consumption within the area comes from producers within the area.

Q In regard to the State of Indiana, sir, is there evidence that coal produced in Indiana is sold in Illinois, and coal produced in Illinois is sold in Indiana?

[2471] A I recall evidence that coal produced in Illinois is sold in Indiana.

I draw a blank as to whether there is evidence on coal being sold from Indiana into Illinois.

Q Assume, sir, that the Illinois coal producers collusively or otherwise raised their prices, while the Indiana producers' prices remained at a pre-collusive raising level.

Where then would the consumers of Illinois coal be most likely to turn, under those circumstances?

A If the price were raised enough to make it above the cost of transportation, there is a possibility of them turning to Indiana or west Kentucky.

There are problems in turning to Indiana in that, if there is collusion in Illinois, since you have the same mines operating in Indiana, the same companies, you are not likely to get a competitive price in Indiana.

To some extent, the same is true of west Kentucky, although there are companies, I believe, which operate in west Kentucky which do not operate in either Illinois or Indiana.

[2472] Q Does the record indicate, sir, that there are any trade associations limited to the producers located in Illinois, Indiana, and west Kentucky?

A The record indicates there is at least one trade association, the Midwest Coal Producers Institute, I believe.

Q And is that limited to producers operating in Illinois, Indiana and west Kentucky?

A I believe that is limited to producers in mining districts 9, 10, and 11, of which would be Illinois, Indiana and west Kentucky.

Q Mr. Folsom, the defendants contend that a number of shipments by Freeman and United Electric to the same customers, as well as to the same identical facility of a number of customers, are not in competition because Freeman shipped to these destinations and/or customers what is called "coal dust."

Do you have any comment on the economic validity of that argument?

A Yes.

Q And what is that, sir?

A I believe that the coal dust is certainly competitive with coal.

The record shows that these facilities [2473] buying coal dust cannot consume coal dust alone, but the record certainly indicates that each time they buy a ton of coal dust, in terms of equivalent BTU's, they are not buying a ton of coal sizes, screenings, if you will.

Now the proportion, or the displacement possible varies according to the utilities who testified here. Union Electric testified that they could take up to 60 percent dust, rather than screenings at one of their plants. One other facility indicated they could only take up to 10 percent dust. One other company—excuse me, not facility.

Q Is it of any significance to you in regard to this dust-screening coal argument in regard to the pulverization of coal as it is used in a number of the electrical generating plants?

A Well, the testimony indicated that the dust could not be used unless there was a coal pulverizer attached to the plant.

In that sense, unless the coal is being pulverized, the company could not buy dust as a substitute for screenings. But they are substitutes to the extent that the company buys dust, and hence are in competition to the extent that they can use dust.

[2474] Q Do you find it anomalous that the defendants argument that so far as the fuel requirements of a number of generating stations, oil, natural gas, and coal are competitive fuels, while they appear to contend that coal dust and other coal sizes are not competitive fuels?

MR. HEDLUND: I will object as to whether or not this witness thinks it is anomalous.

I think that question can be asked without going into that.

THE COURT: Do you have any comment?

MR. CUSACK: I will rephrase it, if you want me to.

THE COURT: Revise the question.

BY MR. CUSACK:

Q Mr. Folsom, the defendants contend that for the energy fuel requirements of a number of electrical gen-

erating stations coal, natural gas, and oil are in competition.

Do you find that argument, from an economic standpoint, inconsistent with their argument that coal dust and other coal sizes are then not in competition?

A Yes. I consider this, from an economic standpoint, trying to go in both directions, one to [2475] expand the market, and the other to restrict the market.

Q Based on the record in this lawsuit, sir, and based on your economic opinion, do you have any views in regard to what United Electric might have done but for its control by Freeman?

A Yes.

Q And what are these views, sir?

A Absent a merger, I see three alternatives facing the United Electric Coal Company.

One, they—

MR. HEDLUND: May I hear—well, your Honor, I'm sorry.

[2476] THE COURT: Proceed, Mr. Folsom.

BY THE WITNESS:

A One, they could mine themselves out of business. I do not believe this is an attractive alternative to the company, based on the testimony of Mr. Kolbe and others. It does not seem to be the type of approach that a company with UEC's assets would take, giving that the customers are very valuable, or are a valuable asset.

Two, that UEC would make an intensive search for strip reserves.

I do believe that this record indicates that high quality strip reserves are relatively scarce in Illinois.

Mr. Kolbe, in his deposition, indicated that they might well turn to strip—might well have turned to strip reserves of a less desirable nature in their search for strip reserves.

Three, there is the possibility that the company would have gone into deep mining. We had the beginning of this approach prior to 1959.

* * * *

[2483] BY MR. CUSACK:

Q Mr. Folsom, Dr. Steiner indicates that the three indicia of competition are structure, conduct and per-

formance. Of those three indicia of competition what would you consider to be the most important?

A I consider structure the most important of those three indicia of competition.

MR. CUSACK: Your Honor, may I make a comment in regard to the question with regard to the concentration nationally and the concentration in the area? There is evidence in the record in this regard.

THE COURT: There is. I have not read it.

MR. CUSACK: It is the Netschert documents versus ours.

THE COURT: All right.

BY MR. CUSACK:

Q Why do you consider structure to be the most important indicia of competition?

A Because for short periods of time you might have collusive behavior, that is, bad conduct, even in an unconcentrated industry. Or you might have good [2484] performance within a highly concentrated industry. But if you have a concentrated industry, you have the potential of bad performance.

An example: the rubber tire industry was studied by Mr. Wilcox during the Temporary National Economic Committee's studies, and he stated that this was a highly concentrated industry which he found at that time to have good performance, because of an individual who acted as a maverick, Harvey Firestone. But Harvey Firestone and others die and you do have the potential of bad performance from the structure, and we have to be concerned about these potentials.

[2485] Q Going back to competition between Freeman and United Electric, there is a good deal of testimony in the evidence that the shipments from the Fidelity Mine in the Belleville District to the Shawnee Plant of the Tennessee Valley Authority were not in competition with the shipments from one of the Orient Mines of Freeman to this plant.

Based on the evidence in the record, what is your opinion as to whether or not the coal shipments from these two mines to this plant of TVA were in competition?

A The evidence in the record indicates that the two companies were under common control at the time of the shipments, and that it was shipped under a Freeman contract.

You might have a different situation if the two companies were not under common control.

The way the thing occurred in the record, I would not say that that particular shipment represented competition. It does show, however, that a coal company will often absorb freight, if you will, or take a lower price, whichever way you wish to look at it, in order to move into a more distant market or to a more distant customer, which is a better description, in order to [2486] keep his mine operating at something near capacity.

* * * *

[2493] CROSS EXAMINATION

* * * *

BY MR. HEDLUND:

Q It also, does it not, provides a framework for potential competition among and between all three of those fuels.

A It does provide a framework for potential competition.

Q You are familiar with the two statements I just read you, are you not?

A No, I am not.

Q Would it refresh your recollection if I were to indicate to you that those two statements I just read you were from the Economic Report on Corporate Mergers of the Federal Trade Commission?

A Not really. That is a very thick report, as you know, Mr. Hedlund. There are so many statements in there, some of which I reviewed, some of which I did not, that I cannot remember every statement that is in there.

Q I understand, Mr. Folsom. You did indicate to me, Mr. Folsom, when we were provided this volume a couple of days ago, that you, in terms of, as it is referred to in the preface, a major contribution to this re-

port, were involved in the matters set forth in Chapter 5 and Chapter 8. You recall that, do you not?

A Yes, I do.

[2494] Q Then, directing your attention to Chapter 5 of that report on page 310, I would like to read to you the following:

> "The impact of these mergers (referring to mergers involving coal companies and oil companies) on competition may be considered from a number of viewpoints. There is a high elasticity of substitution among coal, fuel oil and natural gas as raw materials from which energy is produced. This is particularly marked in the case of electric utilities which have constructed generating stations so they can ultimately consume any of the three principal fuels.
>
> "Before expanding into coal, the petroleum industry occupied a dominant position as a supplier of natural gas as well as fuel oil. The merger trend that Continental-Consolidation set in motion could over time extend that dominance to coal."

Do you recall that appearing in Chapter 5 of the report by the FTC entitled "Economic Report on Corporate Mergers"?

A It sounds familiar.

* * * *

[2499] Q In other words, before you try to define the region in terms of the geographical sense, you try to determine where the competition takes place, or what the competition is, and then you decide or determine what geographical area that takes place in; is that not correct?

A Well, the first statement was as a theoretical statement.

Q Yes.

A Now, you are getting down to a practical application.

As a matter of practical application, you often wind up using areas in asking your questions simply because that is the way the data is often kept by the companies. But from a theoretical standpoint, the geographic area does not determine the market.

Q Thank you.

A The market is determined, then the geographic area.

Q Isn't it true, Mr. Folsom, that state boundaries are generally of little or no significance in determining relevant market?

And I'm talking economically.

[2500] A With exceptions.

In general, political boundaries of any type, state or otherwise, are not a good determinant of a market.

As I indicated earlier, the market is determined, then the boundary.

As a matter of practicality, you often wind up using a political boundary as your best approximation of the market.

Q Are you familiar with any laws of the State of Illinois that have any effect on a determination of a meaningful and relevant market for coal?

A No, I am not. I must admit I am not familiar with the laws of the State of Illinois at all.

There may be mine safety laws and things of this type; I just don't know.

[2501] Q Well, passing the laws that you say you don't know about, is there any other factor that you can name in Illinois that makes the political boundaries of the State a meaningful measure of the relevant geographic market for coal?

A No.

Q Then it would be your view, would it not, Mr. Folsom, that the opinion of the Hearing Examiner in the Kennecott case was correct when he stated, commenting on your testimony in that case—

MR. CUSACK: On what page is that, please?

MR. HEDLUND: It is page 193.

MR. CUSACK: I wish counsel would—

MR. HEDLUND: Page 172 of the original transcript.

MR. CUSACK: I would like to point out for the record that I would appreciate it, Mr. Hedlund, if you would let us know what documents you are going to use with Mr. Folsom on cross examination; then I could go a little faster.

MR. HEDLUND: I'm sorry.
May I have the beginning of my question?
THE COURT: Yes, read it.
MR. CUSACK: May I read along?
THE COURT: Is there any objection?

• • • •

[2505] Q And you testified you had spent about 300 hours [2506] so far in this case, prior to—or did that include the trial time?

A That included the trial time.

Q You came to Chicago a month before the trial started; is that correct?

A Approximately. I don't remember—wait a minute. I believe it was more than two months before the trial started, because there was a delay. I had thought I would be coming up about a month earlier, or two weeks earlier, or something, than I did. I don't remember the specific date.

Q Do you recall in Kennecott, do you not, that counsel for the Federal Trade Commission stated that you were not an expert in coal usage? You recall that, do you not?

A I don't recall it. If you say he stated it, I have no reason to question it.

[2507] Q He did so state it at pages 782 of the transcript, Mr. Kadish saying:

> "Again I state that Mr. Folsom is not an expert in coal usage."

Was that true at the time?

A Yes.

Q Prior to that case, do you recall, page 772 of the transcript, being asked this question:

> "Q How many weeks did you spend reading up on coal?
>
> "A Weeks.
>
> "Q Or days?
>
> "A Approximately three months."

Do you recall being asked that and giving those answers?

A That in general accords with my recollection. Remember, this was a year ago, and I don't recall the specific

answers. That time would have been fresh in my mind at that time.

Q I understand.

* * * *

[2516] Q You would also agree that a man should study the market for a very long period of time before trying [2517] to say that this is the market. Would you agree with that, too?

A Define "a long period of time." In general a man should make an intensive study if he is going to define the market.

Q Numbers alone do not define the market, do they?

A No, they do not.

Q And you have to know the buy-sell relationship, and you have to consider a number of other factors other than just numbers in defining a market, don't you?

A Yes, you do.

* * * *

[2519] Q It is your understanding, is it not, Mr. Folsom, that metallurgical coal and steam coal are not competitive, at least for metallurgical coal uses, is that correct?

A Yes.

Q Of course, the Government statistics, none of them, separate that, do they?

A In the midwest area I did not see any Government statistics separating metallurgical coal.

Q So that in effect these statistics, if there is no separation, and if the statistics include both steam and metallurgical coal, they are combining within those statistics two entirely different and non-competitive products, isn't that correct?

A No. I don't believe that is correct. In this area, if I may comment, the Orient No. 3 Mine, for example, sells metallurgical or coal for metallurgical purposes. It also sells some coal for steam purposes. So it seems that within that particular mine—and I don't know whether that is typical of mines in the midwest—the coal which could be for use for metallurgical purposes also can be used for steam purposes. One of your exhibits also states this.

[2520] I don't know what the price differential is, et cetera. It is obvious that there is some coal that can be used for steam purposes that cannot be used for metallurgical purposes. It is not obvious the other way around.

Q What about with respect to United Electric? You know if it has any coal that can be used for metallurgical purposes?

A From what I saw of the data on coal characteristics at UEC, it does not have any coal that could be used for metallurgical purposes that it is currently mining. I did not see data on coal analysis of any possible reserves they might have.

[2521] Q With respect to coal produced in the State of Illinois, do you have any knowledge of what percent of that coal is sold for metallurgical purposes?

A No, I don't have a knowledge of the percent sold for metallurgical purposes.

Q What about the State of Indiana?

A No.

Q What about west Kentucky?

A No.

Q But it would be your conclusion, would it not, that metallurgical coal and steam coal are not part of the same relevant market?

A It would be my conclusion that metallurgical coal cannot be substituted for by steam coal. If, in fact, a substantial quantity of that which could be used for metallurgical purposes is being sold as steam coal, then it seems to me appropriate to combine the two in looking at the market.

Q The market for what?

A For coal.

Q For all coal, or for steam coal?

A For all coal.

Q If you were to look at the market for metallurgical coal, would you include steam coal in that?

[2522] A The market for metallurgical would be, I think, a sub-market, and you would not consider—it becomes so inter-related, I'm not certain that you wouldn't have to consider the steam market there, because the

utility, if this metallurgical coal is selling for about the same price on a BTU basis as the steam coal, the utility is competitive, in a shortage, even with the—in its purchase, even with the companies who are buying coal for metallurgical purposes.

Q Do you know what, if any, price differential there is between steam coal and metallurgical coal?

A No, I don't.

Q Do you recall being asked the question, and giving the following answer in the Kennecott case, at page 760, where you were asked as follows:

"Q Would it follow that they are not"—

MR. CUSACK: Just a moment, please.

MR. HEDLUND: I'm sorry. I will start again. Page 759 of your testimony.

* * * *

[2536] AFTERNOON SESSION

2:00 p.m.

* * * *

Q Well, then—all right, let me ask you, do you believe that the Eastern Interior Coal Province Sales Area constitutes a reasonable determination of an economic market?

A Looking at the various markets, I was not as happy with the Eastern Interior Coal Province, in spite of the high percentages, as I was—not as satisfied with the definition as I was with the State of Illinois. I think I indicated to you some of the problems I had with the Eastern Interior Sales Area, namely, the State of Indiana being a big problem.

[2537] Q I understand that. But my question is, do you think the Eastern Interior Coal Province Sales Area represents a reasonably good approximation of an economic market?

A Yes, I think it is a reasonable approximation, with some reservations.

Q You stated this morning, Mr. Folsom, I believe, that in defining markets you always have imprecisions?

A Yes.

Q I believe on Monday Professor Steiner also said that market definitions is not a council of perfection

and that his criticism of the Government's markets was not that they were less than fully perfect, but that they were less good than they should be.

Now, isn't it true, Mr. Folsom, as far as economists are concerned, that given two conflicting market definitions, both with approximations, that the task then for the economist is to determine which of the two makes the most economic sense?

A Yes.

Q You would agree with that?

A Yes.

Q Are you familiar with the concept of a unified market?

A Roughly.

* * * *

[2556] Q You have referred to the competition in the east between all of the various forms of energy, because that is not a native fuel area. Wasn't that the concept or is that the phrase you used?

A Yes, that is the phrase which is in the exhibit DX-102.

Q And I believe you testified that the midwest, or, let's say, Illinois is a native fuel area; is that correct?

A Yes.

Q And it was your testimony that, based on costs in Illinois, that nuclear energy does not compete with coal; is that the thrust of your testimony?

A I think my testimony was that the utility people had indicated a substantial cost differential between nuclear and coal, particularly those located in the State of Illinois, with the exception of Commonwealth Edison, and that based on that price differential, and the fact that you could not use nuclear for less than a 500 megawatt efficiency, that I would separate them.

But at the same time I indicated that I did recognize that there was such a thing as an energy market.

* * * *

[2563] Q I believe, Mr. Folsom, you stated that the evidence in this record from customers indicated that as far as they were concerned, the primary competition for their business was that provided by coal suppliers?

A If the record shows that, I misspoke; or else the record is incorrect.

I believe that what I saw in the record when the coal people were asked about their primary competition [2564] they mentioned first other coal companies, and that some of the exhibits, the publications which you have put into the record, speak of head-to-head competition and the most immediate competition being the head-to-head competition between fuel companies within the same line of operation, or with the same product.

Q This is what the coal producers said?

A The coal producers, and some of the publications.

Q Yes. What do the customers in this case say?

A The customers in this case all—all the utility customers have indicated that they consider all sources of fuel in making the decision.

Q There was nothing then that they considered their—the primary competition for their business was coal?

A They did not say that they considered the primary competition coal with reference to future facilities, certainly.

[2565] Q In fact, many of them said just the opposite, didn't they?

A They also said they would consider all things, and then make a decision. Many of them stated about price and what they assumed their facilities would be.

Q I would like to ask your opinion on what Mr. Corey said at page 1612 and 1613. I'm not going to read the entire answer. If Mr. Cusack wants to, he can get it on redirect.

I asked Mr. Corey the following:

> "In your opinion, Mr. Corey, what is Commonwealth Edison's major concern with respect to competition among its fuel or energy suppliers?"
>
> "A I guess it is to have adequate competition. And as the energy field gets more diverse, it is hopefully to continue to have effective competition between coal and oil, and nuclear. I believe that is one way of putting it."

Then he said:

> "I really would hate very much to see that we had to turn to coal, oil, and uranium to just two or three major oil companies. We might then find that we did have a very distinct lack of competition."

[2566] MR. CUSACK: The word is "for coal," not "to coal."

BY THE WITNESS:

A I recall the context in which he said that, yes. And I would agree with him, that I would hate to see only two or three companies selling oil, nuclear, and coal, that it would be of big concern, and not only from the standpoint of competition, but from the standpoint of the individual customers.

* * * *

[2572] BY MR. HEDLUND:

Q I gather, Mr. Folsom, it is your position as an economist, that from an economic standpoint, this merger took place in 1959?

A From an economic standpoint, I think control occurred in 1959.

Q And would you equate as an economist control with merger, or wouldn't you? I don't want to be playing games. I just want to find out where you come out on it.

A I do have a problem in equating that with a merger, and that problem is the minutes from General Dynamics in the early 1960's, where they were in the tight cash situation and were considering selling. So, mergers are not that easily revocable in general. That almost sounded at that time like General Dynamics looked at this as an investment, not complete control of the company.

Q You are basing that on the minutes?

A Yes.

Q You are disregarding the testimony of Mr. Nugent?

MR. CUSACK: I think that is an unfair characterization of Mr. Nugent's testimony, and on that basis I object.

MR. HEDLUND: I am asking.

THE COURT: He may answer. Objection is overruled.

BY THE WITNESS:

A My understanding is Mr. Nugent testified that [2573] it was his intention throughout that they merge. I may be wrong. If I am, I would be happy to be corrected.

Q In any event, I gather, Mr. Folsom, in terms of the structure aspect of this merger, you feel the structure within the industry as a result of this merger changed in 1959, not 1967?

A Yes, I do.

Q That, as you say, is the prime element of determination of the anti-competitive effect of the merger?

A The change in structure is a prime indicator. If there was not a change in structure, if you don't consider it as a change in structure in 1959, then I think what you wind up with is having a situation where from 1955 to 1966 you had almost a collusive action between two coal companies, because you had essentially the same board of management directing two coal companies, and I prefer to think that was not a collusion after 1959, that it was a more legitimate form of control.

* * * *

[2578] Q Even a year after Mr. Kolbe is saying "underground mining is not our business," isn't that correct?

A Oh, yes. That is correct.

Q Is it your view of the record that Mr. Kolbe acquired these reserves for Amalgamated because he wanted to go into the deep mining business?

A You are talking about the reserves required specifically for Amalgamated?

Q Correct.

A I don't think there is sufficient information to indicate one way or the other whether he planned to go into the underground mining business, because he was buying those reserves for Amalgamated.

Q Do you recall Mr. Kolbe testifying as follows, at page 189 of his testimony:

"The Beaucoup field. We said we did not care to tie up money that would not be—for coal fields that might never be mined and certainly would not be mined for a long time in the future. But they said they would. Their position, of course, was different."

Do you recall that testimony of Mr. Kolbe?

A Very generally. There are 900 plus pages of Mr. Kolbe's deposition, Mr. Hedlund. I read each and [2579] every one of them, but that doesn't—would you read that again so I will have it in mind if you wish to ask a question about it?

* * * *

[2581] Q Because if it had occurred after 1959, it is natural that it might occur because of the presence of Freeman, isn't that correct?

A There I have my interpretation of the record, namely that there was control and that it was being operated essentially as one company. Mr. Thorson disagreed with my characterization of the testimony. He was the director of UEC who did not feel it was being operated in that manner.

Q I gather, Mr. Folsom, that with regard to the disappearance of all these companies between 1957 and 1967, referred to as "other companies," the remaining companies in Government Exhibits—I assume that you agree that mergers by no means explain even a substantial portion of those disappearances.

A Yes, I do. You are talking about the smaller companies when you say "other companies."

Q Yes. With respect to Professor Steiner's testimony on that score, the two of you are in agreement, is that right?

A I think so.

* * * *

[2582] Q Let me rephrase the question: If we assume that United Electric would not have acquired additional economically mineable strip reserves, or had not been able to acquire additional economically mineable strip reserves between 1959 and 1967, if they had been inde-

pendent and if we assume that if they had been independent they would not have gone into deep mining, I gather your testimony is that except for this change in structure in market shares, this common ownership did not have an adverse effect on competition?

[2583] A The change in structure which reflects the loss of competition between the two companies during that period and beyond, yes. Nothing beyond that.

Q With my two assumptions?

A With your two assumptions, of course.

Q Of course, you don't agree with those two assumptions, is that correct?

A No, I don't.

Q So you don't agree with the testimony that indicates that they could not during that period, would not have, even absent Freeman, that they would not have gone into deep mining, absent Freeman?

A No, I don't.

Q You do not agree with the testimony of Mr. Camicia?

A Did Mr. Camicia testify that absent Freeman they wouldn't have done either of those? I don't recall you asking him, nor do I recall the Government asking him that question. If he so testified, then I would state that I don't agree.

Q As far as Illinois is concerned, or the EICP Sales Area, assuming the Government's definition for the moment, I gather it would be your testimony that if United Electric could not in the future acquire additional [2584] economically mineable strip reserves to serve those markets and either could not or would not undertake deep mining successfully, that the common ownership of these two companies would have no future adverse effects on competition in those markets. Is that your testimony?

A I haven't been asked that question, but I will say that if you start from today and if you make those two assumptions, assuming that they don't open any more mines, most of the coal in their current mines are committed, et cetera, that UEC is not going to be in that situation a viable competitive force in this market, even if it is divested from General Dynamics.

Does that answer it?

MR. HEDLUND: Your Honor, might this be a good time to take a short recess?

THE COURT: A five-minute recess.

(There was a short recess, after which the following further proceedings were had herein, to-wit:)

* * * *

[2589] Q I would like to ask you another question based on these assumptions.

Assume that two other coal producers, two coal producers other than UEC and Freeman, who are within this leading company list for 1967 proposed to merge and assume that UEC and Freeman are independent, unaffiliated companies.

Now, assume that one of these companies—one of these companies that proposes to merge has an annual production of approximately 6 million tons and the other approximately 4 million tons.

I would like you to assume further that the combined company, thus, with approximately 10 million tons of coal production would range behind Peabody as the second largest producer in the Illinois and the Eastern Interior Coal Province, with more than 13.5 percent of Illinois production, and 7.5 percent of the EIPC.

I will also ask you to assume that this combined company had coal reserves exceeding those of the combined UEC and Freeman operations by approximately 70 million tons.

And, finally, I want you to assume that the combined company would operate 8 coal mines located in [2590] Fulton-Peoria, Mineral-Atkinson, Murdock, Belleville, southern Illinois, and the west Kentucky freight rate district.

On the basis of those assumptions, Mr. Folsom, I would assume that you would agree, or that you would believe that the merger of the two companies in question would lead to the structural changes which you have referred to as essentially similar to those of UEC and Freeman combination, and would pose a similar threat to competition.

A I would be bothered by that acquisition, and would want to investigate that particular merger, if I were in a position to make the policy decision. I would want to investigate a merger between any of the top nine companies in the Illinois—State of Illinois at this particular time. We had 17 of those companies in 1957; we are down to about 9,000, about 300,000 tons annually. We are beginning to get too small in number to depend upon a structure to give good competitive performance, given the differential in size, and the presence of the Peabody, and a 13.5 percent combined second company.

Q So I gather then that just on the facts that I have given you, you would not conclude that that proposed merger posed a threat to competition?

[2591] A I would conclude that it proposed sufficient threat to look at it.

Q And you would—

A I don't recall—

Q You would have to look further, would you not?

A I think that would be true of any acquisition, Mr. Hedlund. I would not jump at one fact, and say, on the basis of one fact, "I'm going to draw a conclusion about competition."

Q Even if that one fact was simply market share?

A If—will you add that both companies were viable competitors?

Q Yes, in the same market.

A If they both were viable competitors and if we talk about the same market and the same level of concentration, top four approximately 75 percent today, I think that I will change and say, "Yes, I would, on that one fact alone, that would be almost presumptive evidence of an anti-competitive merger."

I would still want more information. I would still want to look further.

• • • •

[2595] Q Do you recall the deposition of Mr. Nicosin of Indianapolis—Indianapolis Service?

A I recall having read Mr. Nicosin deposition, yes.

Q Do you recall that he was asked this question and gave this answer:

"Does the presence of coal deposits and mines in Illinois and Kentucky serve as a restraint on the prices that Indiana coal producers can charge you?"

That was by Government counsel.

And there was an objection by me, saying that I did not understand the question.

But the question was repeated:

"Do you understand it?"

"A I am not sure that I do. Again I think the answer would be 'no,' in that transportation is such a big chunk of it, I don't see how a mine"—

There was an interruption here.

[2596] "—I don't see how mines way over on the other side of Illinois puts any restraint on Indiana."

Do you recall that?

A I think that is in accordance with my testimony though.

He mentioned transportation, and as I said this morning in terms of the price differential that if it was as great, or greater than transportation.

* * * *

BY MR. HEDLUND:

Q Yesterday, Mr. Cusack asked Professor Steiner if he knew of examples in analyzing markets where the facts with respect to a single company had in the past been viewed apart from other companies in order to secure a more meaningful and realistic economic appraisal.

I believe you may have testified this [2597] morning that you could think of no place where that sort of thing was done.

BY THE WITNESS:

A I can think of one place where essentially the company was defined as an industry by the Court. I'm thinking of the Alcoa case. And I don't recall any others on that.

* * * *

[2598] Q Do you know—I'm sorry. I will ask one further question.

[2599] Do you know whether Dr. Muller ever used that type of analysis?

A If you say he did, I will not question you. As I said, I wasn't there; I don't know.

Q You came in 1964?

A In September.

Q I gather your ultimate conclusion, Mr. Folsom, is that this merger or combination of the common ownership of these two companies will have an adverse impact on competition?

A My ultimate conclusion is that this merger has had an adverse effect on competition.

Now, as I stated earlier, if you were talking about divesting the company with no reserve, then a continuation of the—it seems to me from the economic standpoint—and again the competition—if you are going to divest the company with no reserves, either you are not going to have a gain to competition from the divestiture, and thus the continuation of the ownership would not be in that—given those two alternatives, adverse to competition.

* * * *

REDIRECT EXAMINATION

BY MR. CUSACK:

* * * *

[2607] Q I hand you what has been received into evidence as Government's Exhibit 52, which is a chart entitled "1967 Sales of Coal in the Eastern Interior Coal Province Sales Area by Coal Producers Located in Illinois, Producing District No. 10; Indiana, Producing District No. 11; and Western Kentucky, Producing District No. 9."

I ask you to examine this exhibit, sir, and on the basis of the exhibit to tell us your opinion as to the validity of the Government's choice of the Eastern Interior Coal Province sales area as one of the relevant economic markets in this lawsuit.

[2608] A I do not believe that this exhibit will stand alone—I do not believe standing alone it will justify seeing the Eastern Interior Coal Province Sales Area as a market. It gives you some basis for this, in that the percentages of production sold within the area, production by the companies in the Eastern Interior Coal Province, is fairly substantial in terms of their sales within the area; but you have to have the testimony from the people about the fact that they buy coal all over this area, etcetera, to justify saying this is an economic market.

[2609] Q This does not show, however, does it, that 82 percent of the coal sold in 1967—correct that, 82 percent of the coal produced in 1967 was sold in the Eastern Interior Coal Province Sales Area?

A Yes, it does.

THE COURT: Let me ask this one question. Are you through with that? I would like to ask a question.

MR. CUSACK: Yes, your Honor.

THE COURT: Considering Government Exhibit 53, in that it covers the Production Districts 9, 10 and 11, is there any part or portion of that that you would consider would be, from an economist's point of view, a more relevant market?

THE WITNESS: Than the Eastern Interior Coal Province—

THE COURT: Yes.

THE WITNESS: From the economist's standpoint, I think the state of Illinois is a better definition of a relevant market than is this.

THE COURT: Thank you.

THE WITNESS: If I may add, it is because of the transportation factor.

THE COURT: Yes. Proceed.

* * * *

[2612] Q Mr. Hedlund, during your cross examination, spoke to you about a statement at page 310 of the Economic Report of the Federal Trade Commission, saying that:

"There is high elasticity of substitution among

coal, fuel oil and natural gas as raw materials from which energy is produced."

Isn't it true, sir, that this statement was referring mainly to the eastern seaboard of the country?

A I don't recall that I wrote that statement, Mr. Cusack, and I don't know what the author of that statement had in mind. I read that statement. I think that it is more applicable to the eastern seaboard.

Q Isn't it true, Mr. Folsom, that in the state of Illinois and in the Eastern Interior Coal Province Sales Area there is not a high elasticity of substitution among the coal, fuel oil and natural gas as raw materials from which energy is produced?

A Historically there has not been a high elasticity of substitution in this area.

* * * *

[2613] show it to counsel.

THE COURT: Any objection?

MR. HEDLUND: I have no objection to identifying it, but—

MR. CUSACK: I have to identify it first, your Honor.

THE COURT: I thought it was identified.

MR. CUSACK: I wanted to show it to him first.

THE COURT: I thought you meant it was identified before but that you had not offered it. Is that correct?

MR. CUSACK: I believe I talked to him about it, but I am informed by my co-counsel that I did not do it right.

THE COURT: We will accept Mr. Braun's statement. Have it marked for identification.

MR. CUSACK: I will ask the reporter to mark for identification as GX-142 a schedule entitled "Commonwealth Edison Company Cost of New Generating Units, Edison Exhibit 1.7."

(Said document was marked as GX-142 for identification.)

MR. CUSACK: The Government moves the admission in evidence of GX-142 for identification.

THE COURT: Any objection?

* * * *

[2619] Alcoa as being a situation where you had had a one company industry essentially.

Q Alcoa, then having a monopoly over the production of aluminum?

A Of primary aluminum ingots.

Q Mr. Hedlund asked you on cross examination with regard to whether or not you could group the mines in the Southern Illinois Freight Rate District with the mines in the West Kentucky Freight Rate District. The evidence in this case shows, sir, that in 1967, of the total of 46,710,000 tons of coal consumed in Illinois, 3,150,000 tons originated in West Kentucky and 1,088,000 tons originated in Indiana.

Would this indicate to you that Illinois was an economic market to the exclusion of West Kentucky and Indiana?

A That alone would not indicate that Illinois was an economic market. It would be one of the factors considered.

Q Mr. Hedlund asked you with regard to whether or not any of the generating stations of the Union Electric Company were located in Illinois. Would it refresh your recollection if I told you that the Sioux Plant of Union Electric was located at Alton, Illinois, [2620] and the Venice Plant was located in East St. Louis?

MR. HEDLUND: I am going to object. Mr. Cusack knows full well that the Sioux Plant is not located in Illinois. It is located in Missouri. There is evidence in the record—

THE COURT: Do you accept that correction?

MR. CUSACK: I was relying on Dr. Steiner when he said it was in Alton yesterday. Perhaps we are both wrong.

MR. HEDLUND: I believe Professor Steiner—well, if he did, the record will show what he said, but the facts are clear that the Sioux Plant is not in Illinois.

THE COURT: Will you accept that amendment and then let him answer the question?

MR. CUSACK: I will withdraw the question. Dr. Steiner and I are wrong.

BY MR. CUSACK:

Q You testified, Mr. Folsom, that on the basis of the fact that most of the United Electric coal has been sold at the present time, it appeared that the anti-competitive affects of merger already had occurred, is that correct?

A I don't think that is exactly what I testified to. Shall I say what I testified to? I testified that [2621] most of the loss of competition which would be in part the anti-competitive effects was that you had had a loss from 1959 to this date. I think that there is an additional loss in that you lost the potential. What I testified to was with respect to the future, that if you took a company without any reserves and made it an independent entity, it would not be a big stimulus to competition.

Q So, would one of the anti-competitive effects of this merger be that United Electric—that the owners of United Electric—had not added to its reserve base as its coal had been mined and monies had been transferred from United Electric to its owner? Would this be an anti-competitive effect of this merger?

MR. HEDLUND: Your Honor, I am going to object. Even on redirect examination I think this is an overly-leading question.

THE COURT: He may answer.

[2622] BY THE WITNESS:

A I would not look at the transfer of money, because that is a financial operation. I consider it an anti-competitive effect that UEC's position in the coal industry was not expanded, either through acquiring additional strip reserves of the quality they now have or going into deep mining. The transfer of money is incidental, insofar as I as an economist would look at this.

BY MR. CUSACK:

Q Would you concede, though, that if United Electric had remained a separate company it would have had substantially more funds available to it to go into under-

ground mining or to acquire additional strip reserves?

MR. HEDLUND: I am going to object, your Honor. I think he gave the answer to the question that Mr. Cusack asked—

THE COURT: Objection sustained.

• • • •

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

[Filed June 7, 1972]

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION ET AL., DEFENDANTS

NOTICE OF APPEAL TO THE SUPREME COURT OF THE UNITED STATES BY THE UNITED STATES OF AMERICA

Notice is hereby given that the United States of America, plaintiff herein, appeals to the Supreme Court of the United States from the judgment entered April 13, 1972, dismissing the complaint in this action. Appeal is taken pursuant to the Expediting Act of February 11, 1903, 15 U.S.C. 29.

/s/ John E. Sarbaugh
JOHN E. SARBAUGH

/s/ Howard E. Shapiro
HOWARD E. SHAPIRO
Attorneys
Department of Justice

1718

SUPREME COURT OF THE UNITED STATES

No. 72-402

UNITED STATES, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, ET AL.

APPEAL from the United States District Court for the Northern District of Illinois.

The statement of jurisdiction in this case having been submitted and considered by the Court, probable jurisdiction is noted.

December 11, 1972

☆ U. S. GOVERNMENT PRINTING OFFICE: 1973 513301 73

FILED
OCT 10 1973
MICHAEL RODAK, JR., CLERK

APPENDIX
EXHIBITS (Pages 1-480)

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,
Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

		Page
Government Exhibits:		
GX 1—	Annual Report of General Dynamics Corporation 1960	1
GX 2—	Annual Report of General Dynamics Corporation 1961	3
GX 3—	Annual Report of General Dynamics Corporation 1962	5
GX 4—	Annual Report of General Dynamics Corporation 1963	6
GX 5—	Annual Report of General Dynamics Corporation 1964	7
GX 6—	Annual Report of General Dynamics Corporation 1965	8
GX 7—	Annual Report of General Dynamics Corporation 1966	9
GX 24—	Chart entitled "The United Electric Coal Companies Fixed Assets, Long Term Indebtedness, Working Capital and Net Assets or Stockholders Equity 1940 to 1967"	10

Government Exhibits:—Continued		Page
GX 25—	Chart entitled "The United Electric Coal Companies Net Sales, Earnings Before Income Taxes, Net Earnings, and Net Earnings as a Percentage of Net Sales 1940 to 1968"	12
GX 26—	Standard & Poor's Industry Surveys—"Coal," April 28, 1966, Section 2, Basic Analysis	13
GX 27—	Letter dated March 26, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Declared and Paid by UEC during the period January 1, 1950 to December 31, 1967	29
GX 29—	Standard Industrial Classification Manual 1967	33
GX 31—	Chart entitled "The Consumption of Fuel by Steam-Electric Plants in the Eastern Interior Province Sales Area for the Years 1960-1967"	37
GX 32—	Chart entitled "Consumption of Fuel (Shown in Millions of BTU's) by Portland Cement Plants in Illinois in 1967" and Chart entitled "Consumption of Fuel by Portland Cement Plants in Eastern Interior Coal Province Sales Area in 1967"	38
GX 34—	Financial Statements: The United Electrical Coal Companies; Year Ended December 31, 1968	40
GX 35—	City, Water, Light & Power (Springfield) letter to Department of Justice dated March 21, 1968	42
GX 36—	Illinois Power Company letter to Department of Justice dated March 21, 1968	46
GX 37—	Dairyland Power Cooperative letter to Department of Justice dated April 23, 1968	53
GX 39—	Corn Products Company letter to Department of Justice dated May 24, 1968	57
GX 41—	Union Carbide Corporation letter to Department of Justice dated August 2, 1968	60
GX 43—	Dundee Smith Company letter to Department of Justice dated August 22, 1968	62
GX 49—	A Staff Report on National Gas Supply and Demand by the Federal Power Commission	65
GX 51—	Chart entitled "Coal Shipments to Illinois Destinations by District of Origin, 1965 to 1967"	67
GX 52—	Chart entitled "1967 Sales of Coal in the Eastern Interior Coal Province Sales Area by Coal Producers Located in Illinois, Indiana and Western Kentucky"	68
GX 54—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Crown Mine to Customer Destinations, 1967	73
GX 55—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 3 Mine to Customer Destinations, 1967	74

Government Exhibits:—Continued Page

GX 56— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 4 Mine to Customer Destinations, 1967 ____ 75

GX 57— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 5 Mine to Customer Destinations, 1967 ____ 76

GX 58— The United Electric Coal Companies; Shipments of Coal in Tons from the Banner Mine to Customer Destinations, 1967 ____ 77

GX 59— The United Electric Coal Companies; Shipments of Coal in Tons from the Cuba-Buckhart Mines to Customer Destinations, 1967 ____ 78

GX 60— The United Electric Coal Companies; Shipments of Coal in Tons from the Fidelity Mine to Customer Destinations, 1967 ____ 79

GX 61— Chart entitled "Total Coal Consumption in Tons in 1967 by Steam Electric Plants in the Eastern Interior Coal Province Sales Area and the Total Sales of Coal in Tons in 1967 from Mines located in the Eastern Interior Coal Province to Steam Electric Plants in the Eastern Interior Coal Province Sales Area" ____ 80

GX 62— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1957 Calendar Year" ____ 81

GX 63— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1958 Calendar Year" ____ 82

GX 64— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1959 Calendar Year" ____ 83

GX 65— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1960 Calendar Year" ____ 84

GX 66— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1961 Calendar Year" ____ 85

GX 67— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1962 Calendar Year" ____ 86

GX 68— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1963 Calendar Year" ____ 87

GX 69— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1964 Calendar Year" ____ 88

GX 70— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1965 Calendar Year" ____ 89

Government Exhibits:—Continued		Page
GX 71—	Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1966 Calendar Year"	90
GX 72—	Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1967 Calendar Year"	91
GX 73—	Chart entitled "Production of Coal in Illinois by the Top Two, the Top Four, and the Top Ten Producers, 1957-1967, and their Percentage of Total Production for These Years"	92
GX 74—	Chart entitled "Sales of Coal in Illinois by the Leading Companies and Their Subsidiaries in 1967 (From Mines Located in Eastern Interior Coal Province)"	93
GX 75—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1957"	94
GX 77—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1959"	96
GX 85—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1967"	98
GX 86—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky, 1957-1967"	100
GX 87—	Chart entitled "Acquisitions in the Eastern Interior Coal Province since 1954"	101
GX 88—	Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1965"	107
GX 89—	Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1966"	111
GX 90—	Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1967"	114
GX 91—	Chart entitled "Per Cent of Sales of Each Company to Identical Customer Facilities by The United Electric Coal Companies and Freeman Coal Mining Corporation for the Year 1965-1967"	117
GX 93—	Central Illinois Public Service Company letter to Department of Justice dated October 28, 1966	118

Government Exhibits:—Continued	Page
GX 94— Illinois Power Company letter to Department of Justice dated October 17, 1966	121
GX 104— Central Illinois Electric and Gas Company letter to Department of Justice dated October 20, 1966	124
GX 135— March 26, 1970 Petition of Commonwealth Edison to form subsidiary	126
GX 200— United Electric Coal Companies, Board of Directors Minutes—1959	132
GX 201— United Electric Coal Companies, Board of Directors Minutes—1960	133
GX 210— Testimony of Jack Simon before Illinois Commerce Commission	134
GX 219— Keystone Coal Buyers Manual 1967	137
GX 232— Article entitled "The Energy Outlook", by Gerber and Netschert, entered in the IEEE Spectrum, June 1969	144
GX 233— Speech by J. Cordell Moore entitled "The Future Role of Fossil Fuels in Electric Power Generation," at the American Power Conference luncheon in 1968	167
GX 239— Article entitled "New Horizons for Coal—the Comeback Industry", by Robert E. Lee Hall, printed in *The Commercial and Financial Chronicle*, dated March 7, 1968	176
GX 247— Article entitled "Natural Gas Fiasco", printed in *Barron's*, October 13, 1969	189
GX 253— Article entitled "Nuclear Power Economics," 1968-1969 Report by Philip Sporn to the Joint Congressional Committee on Atomic Energy, reprinted in CCH ¶ 3043	194
Defense Exhibits:	
DX 1— October 9, 1957 memorandum from Frank Kolbe to R. J. Hepburn re punch mining	197
DX 2— October 18, 1957 letter from J. M. Morris to Frank Kolbe re Northern States Power Company, Displacing gas with coal	198
DX 3— June 19, 1958 letter from A. J. Christiansen to A. H. Truax with three page attachment	199
DX 4— July 1, 1958 letter from J. M. Morris to Frank Nugent	204
DX 5— July 11, 1958 letter from R. J. Hepburn to Frank Kolbe with two page attachment	206
DX 6— August 4, 1958 letter from "President" to Mr. Justin Potter	209
DX 7— November 21, 1958 *Wall Street Journal* article "General Dynamics Seeks To Acquire Chicago Building Firm"	210

Defense Exhibits:—Continued		Page
DX 8—	December 11, 1958 letter from Geo. Robert Boller to F. F. Kolbe with one page attachment	212
DX 9—	February 5, 1959 letter from Frank Nugent to F. F. Kolbe	214
DX 11—	May 27, 1959 letter from R. J. Hepburn to F. F. Kolbe	215
DX 12—	October 2, 1959 Paul Weir Co. report to F. F. Kolbe	216
DX 13—	May 27, 1960 letter from T. H. Latimer to R. J. Hepburn	224
DX 14—	August 23, 1960 letter from J. M. Morris to C. Evans Parks, Iowa Southern Utilities Co.	226
DX 15—	September 7, 1960 letter from J. M. Morris to H. L. Mann	228
DX 16—	September 13, 1960 letter from H. L. Mann to J. M. Morris	229
DX 17—	November 15, 1961 letter from J. M. Morris to H. L. Mann	230
DX 18—	June 12, 1962 memorandum from R. J. Hepburn to J. M. Morris re Preliminary Report Sunshine Coal Property, Centerville, Iowa	231
DX 19—	November 30, 1962 letter from H. L. Mann to Robert J. Hepburn	235
DX 20—	December 10, 1962 letter from Robert J. Hepburn to H. L. Mann re Iowa Coal Field	237
DX 21—	March 8, 1963 letter from R. J. Hepburn to J. M. Aiken	238
DX 22—	May 19, 1964 letter to Frank Nugent enclosing one page draft letter to Arch Kraakevik of Illinois Power Co.	239
DX 23—	June 16, 1964 memorandum from Irving Crown to Frank Nugent with four page attachment	241
DX 24—	June 29, 1965 memorandum from J. M. Morris to R. H. Inman et al. re Industry field	246
DX 25—	October 27, 1965 letter from J. M. Morris to Frank Nugent with one page attachment	247
DX 26—	January 5, 1966 letter from Q. W. Wellington to J. M. Morris	249
DX 27—	March 8, 1966 memorandum from Dale H. Emling to J. M. Morris with two page attachment	250
DX 28—	March 14, 1966 letter from J. M. Morris to Frank Nugent	252
DX 29—	July 13, 1966 memorandum from D. H. Emling to R. H. Inman	253
DX 30—	July 29, 1966 memorandum from R. H. Inman to T. H. Latimer, et al.	254
DX 31—	August 9, 1966 memorandum from D. H. Emling and B. C. Jensen to R. H. Inman re Star Lake Field, McKinley County, New Mexico	255

Defense Exhibits:—Continued		Page
DX 32—	September 12, 1966 letter from J. Morris to Frank Nugent	256
DX 33—	October 18, 1966 memorandum between R. H. Inman and T. H. Latimer	257
DX 34—	July 31, 1967 letter from Jack A. Simon to Frank Nugent	259
DX 35—	September 31, 1968 four-page coal contract between UEC and Central Illinois Light Co.	262
DX 36—	September 5, 1969 letter from John Welsh, Caterpillar Tractor Co., to Reuben Hedlund re coal versus gas feasibility study	263
DX 37—	September 12, 1969 letter from John T. Cusack to Reuben L. Hedlund	264
DX 38—	1965 Annual Report Zeigler: Coke Company	267
DX 39—	1966 Annual Report Zeigler: Coke Company	270
DX 40—	1967 Annual Report Zeigler: Coke Company	272
DX 41—	1968 Annual Report Zeigler: Coke Company	274
DX 42—	Report to shareholders, three months ended March 31, 1969, Zeigler: Coke Company	278
DX 43—	Report to shareholders, six months ended June 30, 1969, Zeigler: Coke Company	281
DX 44—	Report to shareholders, nine months ended September 30, 1969, Zeigler: Coke Company	284
DX 45—	Statement by Assistant Attorney General Richard W. McLaren to the Cabinet Task Force on Oil Imports, August 8, 1969	287
DX 46—	The Answers of Plaintiff to Interrogatories of Defendants 1(a)-1(g), 1(j), 6-8, 13-15, 17, 18, 20, 21, 23, 26, 27, 30, 37, 44-46, 50, 51 and 54	295
DX 47—	May 29, 1969 letter from John T. Cusack to Reuben L. Hedlund	302
DX 48—	December 15, 1954 letter by George P. Harrington, President, Chicago, Wilmington and Franklin Coal Company to its stockholders	340
DX 49a—	Subpoena Questionnaire form and related court orders	345
DX 49—	Producer data exhibits, mine characteristics	397
DX 50—	Producer data exhibits, comparison of leading producers with other producers	411
DX 51—	Producer data exhibits, coal characteristics by producing districts	419
DX 52—	Producer data exhibits, overburden of strip mines and depth of deep mines	447
DX 53—	Consumer data exhibits, boiler specifications	458
DX 54—	Consumer data exhibits, types of sales by producing districts	461
DX 55—	Consumer data exhibit, analysis of consumption and production of coal by freight rate districts	462

Defense Exhibits:—Continued			Page
DX	56—	Government questionnaire data analysis of consumption and production of coal by freight rate districts	481
DX	57—	1960 utility use of Illinois coal	506
DX	58—	Coal sold under contract	508
DX	59—	Analysis of potential and actual use of fuels other than coal by coal consuming facilities	509
DX	60—	UEC coal reserve data: (a) Summary, UEC coal reserves as of December 31, 1969; (b) United Electric Coal Company's lands and reserve coal, July 31, 1958 through December 31, 1969; (c) Memos on changes in reserve tonnage 1958 through 1969; (d) Potential acquisitions	517
DX	61—	Coal reserves of listed companies in Illinois, Indiana and Western Kentucky 1968	577
DX	62—	Types of coal reserves held by listed companies in Illinois, Indiana and Western Kentucky 1968	578
DX	63—	United Electric Coal Company's committed and uncommitted reserves—by mines	579
DX	66—	May 21, 1968 letter from Wisconsin Electric Power to John T. Cusack	580
DX	67—	Attachments dated February 12, 1968, February 13, 1968, and February 23, 1968 to letter of May 24, 1968 from Corn Products to John Cusack	582
DX	68—	August 15, 1968 letter from Thompson, Hine & Florey to John Cusack	587
DX	69—	September 17, 1968 letter from General Portland Cement to Ronald Futterman	588
DX	70—	September 29, 1969 letter from Mississippi River Corporation to Hugo Sims	590
DX	71—	May 27, 1968 letter from Hall, Patterson, Taylor, McNicol & Marett to John Cusack	591
DX	72—	May 20, 1968 leter from Inland Steel Company to John Cusack with two page attachment	594
DX	73—	November 28, 1966 letter from Vulcan Materials to John Cusack	599
DX	74—	September 11, 1968 letter from River Cement Company to Edwin M. Zimmerman	600
DX	75—	January 24, 1969 letter from Missouri Portland Cement Company to John Cusack	603
DX	76—	December 28, 1966 letter from Norman, Englehardt, Zimmerman, Frankie & Lauritsen to Bertram Long with attachment	604
DX	77—	October 21, 1966 letter from CILCO to Bertram Long	607
DX	78—	September 22, 1969 letter from Missouri Portland Cement Company to Hugo Sims	608
DX	80—	Certified copy of respondent's Exhibit No. 184A-F received in evidence in FTC Dkt. 8765 in the matter of Kennecott Copper Corporation	610

Defense Exhibits:—Continued		Page
DX 81—	1968 Annual Report of Standard Oil Company (New Jersey)	617
DX 82—	Plaintiff's proposed findings of fact 5a, 5b, 5b(2), 5d(4) and 5e(3), *United States* v. *Standard Oil Company* (New Jersey et al.), Civ. No. 954-64, D. N.J. (1964)	623
DX 83—	Plaintiff's memorandum accompanying plaintiff's proposed findings of fact and conclusions of law, *United States* v. *Standard Oil Company* (New Jersey, et al.), Civ. No. 954-64, D. N.J. (1964)	626
DX 84—	Final judgment in *United States* v. *Peabody Coal Company et al.*, Civ. No. 67 C 1621 (N.D. Ill. 1967)	640
DX 85—	"Interfuel Competition and Changes in the Coal Industry Since World War II," report and statistics by Dr. Bruce C. Netschert	647
DX 86—	"Structure and Geography of the Electric Utility Market for Coal," report and statistics by Abraham Gerber	733
DX 87—	Report on coal reserves and deep mining by Paul Weir Company	751
DX 88—	"Availability of Economically Mineable Strip Reserves Within the State of Illinois," report by John E. Organ, Geologist	796
DX 89—	"Impact of Sulphur Oxide Regulations on Midwest Coal Markets," report by Severaky, Environmental Dynamics Research Associates	798
DX 90—	1969 Annual Report of Commonwealth Edison	866
DX 91—	Letter of January 17, 1969 from Preston Kavanagh to Security Analysts	884
DX 92—	Letter of December 4, 1969 from Preston Kavanagh to Security Analysts	886
DX 93—	Commonwealth Edison: Profile of No. 1, *Nucleonics Week*, April 4, 11, 18 (1968)	889
DX 94—	1968 Annual Report of Commonwealth Edison	905
DX 95—	"Edison Seek A-site Downstate," *Chicago Daily News*, March 9, 1970	907
DX 96—	Advertisement entitled "Nuclear Power for Chicago," *Chicago Daily News*, March 13, 1967	908
DX 97—	Advertisement entitled "Commonwealth Edison Reports on Chicago's Air Pollution Problem," *Chicago Sun Times*, July 11, 1969	909
DX 98—	Advertisement entitled "Commonwealth Edison Reports on Progress Toward Cleaner Air," *Chicago Sun Times*, August 27, 1969	910
DX 99—	Advertisement entitled "No Smoke. No Dirt. No Fumes," *Chicago Tribune*, February 3, 1970	911

Defense Exhibits:—Continued		Page
DX 100—	Advertisement entitled "You're Looking at 20,000 Tons of Smokeless, Fumeless 'Coal'," *Chicago Tribune*, March 3, 1970	912
DX 101—	"Coal Strip Mining—Is It Reaching a Peak?" by Hubert E. Risser, Illinois Geological Survey (September 18, 1968)	913
DX 102—	Report of the National Fuels and Energy Study Group to the Committee on Interior and Insular Affairs, United States Senate, 87th Congress, 2d Session (1962)	921
DX 103—	Comparison of Coal-Fired and Nuclear Power Plants for the TVA System, June, 1966	996
DX 104—	Letter of October 17, 1962 from Elmer Hill to Barton Gebhart	998
DX 105—	Letter of October 18, 1962 from Barton Gebhart to Elmer C. Hill with two page attachment	999
DX 107—	*Central Station Nuclear Plants*, AEC Division of Industrial Participation, March 30, 1970	1003
DX 108—	AEC Release N-2, January 13, 1970, re Status Report on U.S. Civilian Nuclear Power Plants	1008
DX 110—	Chart entitled "U.S. Utility Orders for Electric Generating Equipment"	1011
DX 111—	Letters of February 19 and 22, 1968 from Richard P. Ryan, General Counsel, Humble Oil and Refining Company to John T. Cusack	1012
DX 112—	Excerpt from Minutes of Meeting of Board of Directors of General Dynamics Corporation on September 30, 1966	1015
DX 113—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies on October 9, 1959, May 13, 1960, July 15, 1960, September 9, 1960, October 28, 1960, March 10, 1961, May 12, 1961, September 8, 1961, May 18, 1962, July 13, 1962, March 8, 1963, September 13, 1963, May 8, 1964, and August 12, 1966	1022
DX 114—	Proxy statement of The United Electric Coal Companies 1954, 1955, 1956, 1957, 1958, 1959, 1960	1041
DX 116—	Nuclear Power Briefing For The Coal Industry, September 29-30, 1966. USAEC	1042
DX 136—	Advertisement entitled "Caution: Commonwealth Edison is Hazardous to your Health", *Chicago Sun Times*, July 8, 1969	1085
DX 137—	Advertisement entitled "Before everyone runs out of breath talking about pollution, we're doing something to clear the air," *Chicago Sun Times*, December 12, 1969	1086
DX 138—	1969 Steam-Electric Plant Factor	1087

Defense Exhibits:—Continued		Page
DX 144—	Map entitled "Investor-Owned Electric Utility Service Areas"	1098
DX 145—	Map entitled "Service Area, Dairyland Power Cooperative"	1099
DX 146—	1966 Annual Report, Union Electric Company	1100
DX 147—	1967 Annual Report, Union Electric Company	1102
DX 148—	1968 Annual Report, Union Electric Company	1103
DX 149—	1968 Annual Report, Northern States Power Company	1104
DX 150—	"Fuels and Fuel Transport for Electric Energy," chapter 3 of "National Power Survey," a report by the Federal Power Commission (1964)	1107
DX 151—	Article entitled "Chicago's Dirty Air—A Growing Peril," *Chicago Sun Times*, October 19, 1967	1120
DX 152—	Article entitled "Antipollution, Antitrust Bills Are Signed by Gov. Ogilvie," *Chicago Sun Times*, June 26, 1969	1122
DX 153—	Article entitled "Crackdown on Air Pollution!" *Chicago Sun Times*, July 14, 1969	1123
DX 154—	Article entitled "Edison Cuts Use Of Coal, Reduces Air Pollution," *Chicago Sun Times*, November 11, 1969	1124
DX 155—	Article entitled "8 Utilities Face Pollution Probe," *Chicago Sun Times*, November 13, 1969	1127
DX 156—	Article entitled "Clean-Air Edicts Offered In Council; Dimout Suggested," *Chicago Sun Times*, November 18, 1969	1130
DX 157—	Article entitled "Mikva Bill Would Make Air Pollution A Federal Offense," *Chicago Sun Times*, November 20, 1969	1134
DX 158—	Article entitled "Pollution Fight—Edison Tells Coal Doubts," *Chicago Daily News*, December 1, 1969	1136
DX 159—	Article entitled "'Black Diamond' Boom: Kleenburn Coal Mines Enjoy Demand Surge," *The Wall Street Journal*, January 7, 1970	1137
DX 160—	Article entitled "Business Bulletin—A Special Background Report On Trends In Industry And Finance," *The Wall Street Journal*, March 19, 1970	1138
DX 161—	Letter entitled "The News That Nobody Prints," *Mid-West Coal Producers Institute, Inc.*	1139
DX 162—	Article entitled "New Ruckus On Foreign-Oil Imports To Pin Nixon Between Pollution Issue, Coal Groups," *The Wall Street Journal*, March 5, 1970	1141

Defense Exhibits:—Continued Page

DX 163— Article entitled "Commonwealth Edison Is Allowed To Import Low-Sulphur Fuel Oil—Hickel Says One-Year License Doesn't Establish New Policy; Coal Industry Fought Action," *The Wall Street Journal*, March 26, 1970 1143

DX 164— Article entitled "The Real Meaning Of Alaskan Oil Finds," *U.S. News & World Report*, March 3, 1969 1144

DX 165— Article entitled "Petroleum Prize—Oil Firms At North Slope Race For Data As Giant Lease Sale Bidding Approaches," *The Wall Street Journal*, May 2, 1969 1146

DX 166— Article entitled "Jersey Standard Unit To Send Oil Tanker Through Northwest Passage In Test Run," *The Wall Street Journal*, June 4, 1969 1148

DX 167— Article entitled "Three Oil Companies To Study Feasibility Of Building First Coast-To-Coast Pipeline," *The Wall Street Journal*, July 24, 1969 1149

DX 168— Article entitled "Northern Natural Gas Plans Major Canada Pipeline—Cost Of System To Transport Canadian Gas To The U.S. Put At About $1.4 Billion—Government Approval Needed," *The Wall Street Journal*, April 1, 1969 1150

DX 169— Article entitled "People Gas Unit Plans To Buy Midwest Area's First Gas From Canada," *The Wall Street Journal*, June 18, 1969 1151

DX 170— Article entitled "Alberta Agency Backs Northern Natural On Bid To Export Gas To U.S. Midwest," *The Wall Street Journal*, December 17, 1969 1152

DX 171— Article entitled "Consumers Power Announces Plans For Atomic Plant—Dow Chemical Will Be Chief Customer Of New Facility; Cost Put At $267 Million—Completion Is Slated In 1975," *The Wall Street Journal*, December 15, 1967 1153

DX 172— Article entitled "Jersey Standard Joins List Of Companies To Make Nuclear Fuel—Subsidiary To Build Plant In 1970 In Washington State; Research Assigned To Battelle Institute," *The Wall Street Journal*, March 20, 1969 1154

DX 173— Article entitled "In 1970: 23 Utilities Will Ask Bids On 29 Nuclear Units," *Nucleonics Week*, January 15, 1970 1155

DX 174— Article entitled "The Anti-Atom Nuts," *Chicago Tribune*, January 20, 1970 1156

DX 175— Article entitled "Consumers Power Announces Plans For New Plant—Pumped Storage Facility Set For 1973: Detroit Edison To Share Cost And Output—Outlay To Total $186 Million," *The Wall Street Journal*, November 28, 1967 1157

Defense Exhibits:—Continued Page

DX 176— Article entitled "FPC Aide Again Approves Con Edison Bid To Build Power Project; Protests Likely," *The Wall Street Journal*, August 7, 1968 1158

DX 177— Article entitled "TVA Plans To Start $155 Million Project At Raccoon Mountain—Plan Will Include 4 Reversible Pump-Turbine Units With Total Capacity Of 1.4 Million Kilowatts," *The Wall Street Journal*, January 19, 1970 1159

DX 178— Article entitled "Geophysics," *Time Magazine*, July 26, 1968 1160

DX 179— Article entitled "Earth's Own Power Source," *Chicago Daily News*, January 9, 1969 1161

DX 180— Article entitled "Burning Refuse To Be Used In 'Total Energy' Concept," *The Wall Street Journal*, June 28, 1969 1162

DX 181— Excerpt from transcript of Hearings before the Joint Committee on Atomic Energy, 99th Congress, 2d Session, on Participation by Small Electrical Utilities in Nuclear Power.—(Part 1-April 30-May 3, 1968), "Affiliation Is Fast Becoming A Necessity." 1163

DX 182— Article entitled "New England Affiliation Slated —Utility Concerns Plan Affiliation," *New York Times*, June 12, 1968 1164

DX 183— Article entitled "Boards of Iowa P&L And Iowa-Illinois G&E Approve Merger Plan—New Entity, Iowa Energy Corp., Plans To Retire The 2 Utilities' Outstanding Preferred Shares," *The Wall Street Journal*, July 22, 1969 1165

DX 184— Article entitled "Ayrshire Collieries Asks Bids of 5 Firms—Coal Concern Invites Offers To Purchase Or Merge With It; Replies Expected Next Month," *The Wall Street Journal*, November 27, 1968 1166

DX 185— Article entitled "Ashland Oil Plans To Buy Or Lease Ayrshire Assets—Boards Vote Proposal That Includes The Sale Of Coal Royalties To Third Firm—Pact Involves $125 Million," *The Wall Street Journal*, January 22, 1969 1167

DX 186— Article entitled "Metal Climax, Ayrshire Sign Merger Accord—Acquisition Of Coal Producer By Metals Firm Valued At Minimum Of $62.6 Million—Boards And Holders To Vote," *The Wall Street Journal*, April 24, 1969 1168

Defense Exhibits:—Continued		Page
DX 187—	Advertisement entitled "Air Pollution Authorities Urge Use Of 'Clean-Burning' Natural Gas—Today, More and More Apartment Building Owners Are Turning To Gas Heat. Things Stay Cleaner Inside And Out," *Chicago Sun Times*, May 16, 1967	1169
DX 188—	Advertisement entitled "1977 The Year Our City Died." *Philadelphia Inquirer*, December 4, 1967	1170
DX 189—	Advertisement entitled "You Can Heat 2½ Houses With Modern Oil For What It Costs To Heat 1 House With Electricity!"	1171
DX 190—	Advertisement entitled "We're Helping Main Street Switch To Nuclear Power."	1172
DX 191—	Advertisement entitled "This Pollution Was Caused By Burning Money. How Much Of It Was Yours?" *Fortune*, March 1, 1968	1173
DX 192—	Advertisement entitled "What's Gas Energy Doing To Make Industry Nice To Be Near?" *American Gas Association, Inc.*	1174
DX 193—	Advertisement entitled "How Nuclear Science May Give America More Gas Energy." *American Gas Association, Inc.*	1175
DX 194—	Advertisement entitled "Boiler Conversion?"—"Get The 5 Advantages Gas Power-Type Burners Give You In Full Measure."—"Midco Converts An Apartment And The Service Staff Is Cut By 2/3." *American Gas Association, Inc.*	1176
DX 195—	Advertisement entitled "Who Offers You 24-Hour Plant Site Location Service On The 60-Mile Illinois Shore? Peoples Gas, Of Course." *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1177
DX 196—	Advertisement entitled "The Not-So-Brief Case For Complete Chicagoland Plant Site Information," *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1178
DX 197—	Advertisement entitled "The Perfect Salt Substitute," *American Natural Gas Company*	1179
DX 198—	Advertisement entitled "St. Louis' Tallest Office Building Will Be Total Energy All The Way," *The Wall Street Journal*, May 13, 1969	1180
DX 199—	Advertisement entitled "The Savings And Loan That Saves With Natural Gas," *American Gas Association, Inc.*	1181
DX 200—	Advertisement entitled "Natural Gas Energy . . . The Electrifier—Pretty Soon You May Be Making Your Own Electricity From Natural Gas."	1182

Defense Exhibits:—Continued Page

DX 201— Advertisement entitled "What Do You Call It? No Matter What You Call It There's A Lot More Coming From Natural Gas Energy—There's A *Lot* More Coming From Natural Gas Energy." *Northern Illinois Gas Company* 1184

DX 202— Advertisement entitled "Another Shopping Center Finds That Making It's Own Electricity Is The Best Buy.—Waukesha Gas Energy Systems Produce Electricity For Lighting, Heating And Cooling." *American Gas Association, Inc.* 1187

DX 203— Advertisement entitled "Sheraton-O'Hare Reduces Utility Costs Over 50%. Waukesha Gas Engines Produce Electricty, Cooling and Heating." *America Gas Association, Inc.* 1188

DX 204— Advertisement entitled "Shoppers Buy All Year Round In An Ideal Climate Created With Gas Total Energy." *American Gas Association, Inc.* 1189

DX 205— Advertisement entitled "School Board Chooses Gas Heat Over Electric And Saves Over $50,000. (That's Just On First Costs. So It's Just First Savings.)" *American Gas Association, Inc.* 1190

DX 206— Advertisement entitled "This New School Uses Gas Energy For Heating, Cooling And Electric Power And Saves $1,000 a Month." *American Gas Association, Inc.* 1191

DX 207— Advertisement entitled "Gas Produces All The Energy This High School Needs (Including Electricity) At A Projected Savings of $11,639 A Year," *Fortune*, May 1968 1192

DX 208— Advertisement entitled "Williams Hardware Buys All Of Its Electricity From The Gas Company. And Saves $14,000 A Year In The Bargain," *Fortune*, November 1968 1194

DX 209— Advertisement entitled "Introducing The Gas Guitar—The Switch To Gas Total Energy Is On," *Fortune*, May 15, 1969 1196

DX 210— Advertisement entitled "Gas Air Conditioning Is Like A Car That's Better Than Good." *Northern Illinois Gas Company* 1197

DX 211— Advertisement entitled "Turn On A Party With A Gas Grill And Gaslight—We Call It The Patio Pair . . . By Charmglow." 1198

DX 212— Advertisement entitled "Now. The Gas Self-Cleaning Oven. For Builders Who Like To Build Sales. Period. It's The Biggest, Wildest, Most Exciting Gas Industry Promotion Ever. Period. The Theme Is: The Gas Self-Cleaning Oven For People Who Like To Cook. Period." *American Gas Association, Inc.* 1199

Defense Exhibits;—Continued		Page
DX 213—	Advertisement entitled "Texas Gas Invites You To The Wireless House."	1200
DX 214—	Advertisement entitled "Here's The Story Of The Gas Fuel Cell. It's Electrifying." *American Gas Association, Inc.*	1201
DX 215—	"Nuclear Steam-Generation of Electricity: Its Implication for the Future of Coal Transport by Railway and Water," by John C. Spychalski, *ICC Practitioners' Journal*, (July-August, 1967)	1202
DX 216—	"The Story of Coal," *The Petroleum Situation* (October 27, 1969 and November 28, 1969)	1215
DX 218—	Chart entitled "The Prime Interest Rate, 1928-1968," *Chicago Daily News*, December 18, 1968	1223
DX 219—	Letter dated March 9, 1970 from V. H. Clark, Secretary-Treasurer, Electric Energy, Inc., to Reuben L. Hedlund	1224
DX 220—	Letter dated June 29, 1942 from Frank F. Kolbe to B. L. Slack	1225
DX 221—	Letter dated July 23, 1954 from Frank F. Kolbe to Herman G. Schenck	1226
DX 222—	Letter dated June 11, 1956 from Frank F. Kolbe to Nye F. Morehouse	1227
DX 223—	Brochure entitled "Taum Sauk, Union Electric's Pumped—Storage Hydro Plant."	1228
DX 224—	Press release, University of Chicago, January 19, 1970	1232
DX 225—	Letter dated May 25, 1960 from Ward B. Chamberlin, Jr., Office of Chief Counsel, General Dynamics Corporation to Robert A. Bicks, Acting Assistant Attorney General, Antitrust Division, Department of Justice and exhibit C thereto.	1233
DX 227—	November 1, 1963 Memorandum from R. H. Inman to R. J. Hepburn re Freeman analysis of Kerr Mine	1236
DX 228—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies of September, 1966, pages 4386-4389	1238
DX 229—	Form 250 Response to the Court-Ordered Subpoena Questionnaire for the Freeman Coal Mining Corporation	1242
DX 230—	April 13, 1970 letter from Mr. Allen Van Wyck, Chairman of the Board of Illinois Power Company, to Donald G. Kempf, Jr.	1244
DX 231—	April 14, 1970 letter from K. E. Bowen, President of Central Illinois Public Service Company, to Donald G. Kempf, Jr.	1245
DX 232—	Brochure entitled "Low Cost Electric Power and Dependability . . . Through MAPP"	1247
DX 233—	Brochure entitled "Mid-America Interpool Network—MAIN"	1249

Defense Exhibits:—Continued Page

DX 234— 1969 Annual Report of Illinois Power Company 1265
DX 235— Article entitled "Shortage of Low-Sulphur Coal Hampers Electric Utilities in Antipollution Efforts," *The Wall Street Journal*, April 6, 1970 1269
DX 236— April 1, 1970 letter from Marvin O. Young, Vice President and General Counsel for Peabody Coal Company, to Reuben L. Hedlund re coal reserves in McDonough, Schuyler, Adams, Brown and Hancock Counties (Illinois) 1273
DX 237— Series of four tables: (1) "Fraction of Total Illinois Production of Leading Companies Other Than Peabody"; (2) "Average Production Per Company"; (3) "Changes in Concentration in Illinois Coal Production Since 1959"; (4) "Changes in Concentration in Illinois, Indiana, and Western Kentucky Since 1959" 1274
DX 238— Telegram of March 5, 1970 from Stephen F. Dunn, President of the National Coal Association, to the President of the United States re foreign oil imports to Midwestern utilities 1278
DX 239— Summary entitled "Proposed Plans of Compliance With Chicago Air Pollution Control Ordinance of Those Facilities for Which a Response to Court-Ordered Subpoena Questionnaire was Received" 1279
DX 240— Excerpts from the Keystone Coal Buyer's Manual from the years 1961, 1963, and 1964 1282
DX 241— Excerpt from the 1968 Annual Coal, Oil and Gas report of the Illinois Department of Mines and Minerals 1289
DX 242— Letter to Department of Justice, Chicago, Illinois from R. E. Hartmann, Alpha Portland Cement Company, dated January 22, 1969 1291
DX 243— Letter to John T. Cusack from Robert H. Gorske, General Counsel, Wisconsin Electric Power Company, dated May 21, 1968 1293
DX 252— Letter to Mr. Reuben L. Hedlund from Clayton G. Ball, Chairman of the Board, Paul Weir Company, dated June 8, 1970 1295
DX 254— "Abatement of Sulfur Oxide Emissions From Stationary Combustion Sources" prepared by *Ad Hoc* Panel on Control of Sulfur Dioxide from Stationary Combustion Sources, Committee on Air Quality Management Committees on Pollution Abatement and Control, Division of Engineering, National Research Council, 1970 1298
DX 257— West Central Region Power Survey 1970-1990, A Report to the Federal Power Commission prepared by The West Central Regional Advisory Committee 1381

Deposition Exhibits: Page

Abrahamson Deposition Exhibit 1—Front Cover of 1967 Annual Report of Wisconsin Power & Light Company 1409
Abrahamson Deposition Exhibit 1A—Back page of 1967 Annual Report of Wisconsin Power & Light Company 1410
Beck Deposition Exhibit 1—Letter to Antitrust Division, Department of Justice, Chicago, Illinois, from C. V. Beck dated November 14, 1968 1411
Brazzale Deposition Exhibit 1—Document entitled "Heating Fuel Economic Analysis" for the Federal Office Building and United States Courthouse, Chicago, Illinois 1412
Burton Deposition Exhibit 1—Document entitled "Solicitation, Offer, and Award Contract GS-05S-4945" issued August 1, 1967 1413
Camicia Deposition Exhibit 1—Keystone's Map of the Coal Fields of the United States 1415
Gallagher Deposition Exhibit 3—Mineral Industry Surveys, Bituminous Coal and Lignite Distribution, Calendar Year 1967 1416
Griswold Deposition Exhibit 3—Report of the Secretary of Health, Education, and Welfare to the Congress of the United States entitled "Air Pollution by Federal Facilities" and dated January 1968 1456
Griswold Deposition Exhibit 4—Second Report of the Secretary of Health, Education, and Welfare to the United States Congress entitled "Air Pollution Abatement by Federal Facilities" and dated January 1969 1470
Griswold Deposition Exhibit 5—Document entitled "Operating Experience with Wet-Dolomite Scrubbing" by J. F. McLaughlin, Executive Assistant, Union Electric Co., St. Louis, Missouri, and J. Jonakin, Products Manager, Air Pollution Control Systems, Combustion Engineering, Inc., Windsor, Connecticut, presented at the Air Pollution Control Association Annual Meeting in New York City on June 22-26, 1969 1502
Jensen Deposition Exhibit 12—Memorandum from Burl C. Jensen to Mr. R. H. Inman dated June 7, 1965 1519
Jensen Deposition Exhibit 13—Memorandum from D. H. Emling and B. C. Jensen to Mr. R. H. Inman dated June 7, 1966 1521
Kolbe Deposition Exhibit 2—Annual Report of The United Electric Coal Companies 1956 1526
Kolbe Deposition Exhibit 4—Annual Report of The United Electric Coal Companies 1958 1530
Kolbe Deposition Exhibit 7—Annual Report of The United Electric Coal Companies 1961 1532
Kolbe Deposition Exhibit 12—Letter to Mr. W. B. Hillery, unsigned, by the President dated February 27, 1957 1533

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit 13—Memorandum from T. H. Latimer to Mr. F. F. Kolbe dated February 18, 1957 ... 1534
Kolbe Deposition Exhibit 14—Letter from Frank Kolbe to Frank Nugent dated August 18, 1958 ... 1536
Kolbe Deposition Exhibit 15—Letter from Frank Nugent to Frank Kolbe dated August 20, 1958 ... 1537
Kolbe Deposition Exhibit 16—Profitability comparison between UEC and other coal mining companies (1959) ... 1538
Kolbe Deposition Exhibit 17—Memorandum from R. H. Inman to Mr. Frank F. Kolbe dated November 21, 1957 ... 1541
Kolbe Deposition Exhibit 33—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated May 10, 1961 ... 1542
Kolbe Deposition Exhibit 42—Annual Report of The United Electric Coal Companies 1939 ... 1545
Kolbe Deposition Exhibit 51—Annual Report of The United Electric Coal Companies 1948 ... 1547
Kolbe Deposition Exhibit 57—Annual Report of The United Electric Coal Companies 1954 ... 1548
Kolbe Deposition Exhibit 59—Paul Weir Company Valuation of Physical Assets of UEC as of December 31, 1959 ... 1549
Kolbe Deposition Exhibit 60—Document entitled "Regarding Need For Additional Stripping Equipment at Fidelity Mine" dated June 17, 1966 and signed by J. M. Morris ... 1562
Kolbe Deposition Exhibit 61—Contract and agreement between Alcoa and UEC dated September 5, 1956 ... 1565
Kolbe Deposition Exhibit A—Comparison between Truax-Traer Coal Company and The United Electric Coal Companies ... 1571
Kolbe Deposition Exhibit E—Notebook entitled "Report on Proposed Merged Illinois Operations, Truax-Traer Coal Company, January, 1956" of Theron G. Gerow, Mining Consultant and Engineer ... 1587
Kolbe Deposition Exhibit L—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent ... 1628
Kolbe Deposition Exhibit N—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated October 3, 1955 ... 1629
Kolbe Deposition Exhibit O—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated February 16, 1960 ... 1631
Kolbe Deposition Exhibit S—United States Letters Patent No. 2,325,064, dated July 27, 1943, entitled "Explosive Composition, Robert W. Lawrence, Wilmington, Delaware, assignor to Hercules Powder Company, Wilmington, Delaware, a corporation of Delaware" ... 1634
Kolbe Deposition Exhibit T—Letter from Mr. LeRoy Keane, Assistant General Manager of Hercules Powder Company, to The United Electric Coal Companies dated June 27, 1956 ... 1637
Kolbe Deposition Exhibit W-1—Letter from Frank Kolbe to Harry LaViers dated February 25, 1958 ... 1639

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit W-2—Letter from Harry LaViers to Frank Kolbe dated March 6, 1958 ... 1640
Kolbe Deposition Exhibit W-3—Letter from Harry LaViers to Frank Kolbe dated April 28, 1958 ... 1641
Kolbe Deposition Exhibit X—Memorandum to Robert J. Hepburn from "President" dated December 3, 1957 ... 1642
Kolbe Deposition Exhibit X-1—Letter from R. J. Hepburn to Frank Kolbe dated November 29, 1957 ... 1642
Kolbe Deposition Exhibit X-2—Memorandum from T. H. Latimer to R. J. Hepburn dated November 25, 1957 ... 1643
Kolbe Deposition Exhibit Y—Memorandum from T. H. Latimer to R. J. Hepburn dated November 7, 1955 ... 1646
Kurtz Deposition Exhibit 8—Steam-Electric Plant Factors, 1968 Edition ... 1650
Kurtz Deposition Exhibit 9—Bituminous Coal Facts 1966 ... 1656
Kurtz Deposition Exhibit 10—Bituminous Coal Facts 1968 ... 1657
Latimer Deposition Exhibit 25—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated September 25, 1964 ... 1662
Latimer Deposition Exhibit 38—Memorandum from T. H. Latimer to Mr. R. H. Inman dated July 19, 1966 ... 1664
Latimer Deposition Exhibit 48—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated February 10, 1961 ... 1665
Maguire Deposition Exhibit 1—General Dynamics Proxy Statement and Agreement and Plan of Merger with respect to Material Service Corporation dated November 24, 1959 ... 1666
Maguire Deposition Exhibit 35—Excerpt from the Minutes of the Board of Directors of General Dynamics Corporation on September 30, 1966 ... 1669
Middleton Deposition Exhibit 4—Control Techniques For Particulate Air Pollutants, United States Department of Health, Education and Welfare ... 1676
Morris Deposition Exhibit 3—Memorandum dated December 17, 1959 from R. J. Hepburn to Mr. J. M. Morris ... 1678
Morris Deposition Exhibit 4—Letter from Mr. John M. Morris to Mr. Frank Nugent dated January 10, 1966 ... 1680
Morris Deposition Exhibit 5—Letter from J. M. Morris to Mr. Frank Nugent dated March 14, 1966 ... 1682
Morris Deposition Exhibit 14—Letter dated May 3, 1965 from J. M. Morris to Mr. Frank Nugent ... 1683
Morris Deposition Exhibit 31—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated January 24, 1961 ... 1686
Morris Deposition Exhibit 32—Memorandum from R. J. Hepburn to Mr. T. J. Tarzy and Mr. J. M. Morris dated February 24, 1960 ... 1688
Morris Deposition Exhibit 35—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated July 17, 1962 ... 1689

Deposition Exhibits:—Continued Page

Morris Deposition Exhibit 38—Letter from Mr. R. J. Hepburn to Mr. John Davis dated February 3, 1960 1690
Morris Deposition Exhibit 42—Letter from Mr. J. M. Morris to Mr. Frank Nugent dated October 27, 1965 1691
Morris Deposition Exhibit 46—Memorandum from T. J. Tarry to Mr. J. M. Morris dated February 14, 1961 1693
Morris Deposition Exhibit 47—Letter from T. H. Latimer to Mr. G. I. Grasty dated November 20, 1957 1694
Morris Deposition Exhibit 55—Letter from Mr. Frank Nugent to Mr. John Morris dated April 26, 1965 1695
Morris Deposition Exhibit 59—Letter from G. H. Utterback to Mr. Robert S. Overbeck dated November 29, 1962 1696
Morris Deposition Exhibit 60—Letter from Mr. R. S. Overbeck to Mr. G. H. Utterback dated December 13, 1962 1697
Morris Deposition Exhibit 61—Contract and Agreement between The United Electric Coal Companies and the Aluminum Company of America dated May 3, 1965 1699
Morris Deposition Exhibit 62—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent 1712
Morris Deposition Exhibit 70—Letter from J. M. Morris to Mr. Francis Stanley Jordan dated June 11, 1962 1713
Morris Deposition Exhibit 76—Memorandum from T. J. Tarry to Mr. J. M. Morris dated February 15, 1961 1714
Nix Deposition Exhibit 1—Document entitled "Term Contract Ordering Data for: FSC Group 91 Fuels, FSC Class 9110—Coal, Veterans Administration Facilities and Federal Public Buildings, within the states of Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin" for the effective period of the date of award through June 30, 1968 1715
Nugent Deposition Exhibit 1—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1959 1741
Nugent Deposition Exhibit 2—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1960 1744
Nugent Deposition Exhibit 3—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1961 1747
Nugent Deposition Exhibit 4—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1962 1750
Nugent Deposition Exhibit 5—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1963 1753
Nugent Deposition Exhibit 6—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1964 1756

Deposition Exhibits:—Continued Page

Nugent Deposition Exhiibt 7—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1965 1758

Nugent Deposition Exhibit 8—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1966 1760

Nugent Deposition Exhibit 9—Financial Reports: Freeman Coal Mining Corporaiton; Year Ended December 31, 1967 1762

Nugent Deposition Exhibit 11—Annual Report of the Chicago, Wilmington and Franklin Coal Company for the Year 1953 1764

Nugent Deposition Exhibit 16—Advertisement of Freeman Coal Mining Corporation in 1967 Keystone Coal Buyers Manual 1766

Nugent Deposition Exhibit 17—Advertisement of The United Electric Coal Companies in the 1967 Keystone Coal Buyers Manual 1768

Nugent Deposition Exhibit 19—Advertisement of The United Electric Coal Companies in the 1968 Keystone Coal Buyers Manual 1770

Nugent Deposition Exhibit 20—Advertisement of The United Electric Coal Companies in February 1968 issue of *The Black Diamond* 1772

Nugent Deposition Exhibit 22—Letter dated February 13, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Paid to MSC, Freeman, GD on the Stock of UEC, January 1, 1959 to December 27, 1967 1774

Nugent Deposition Exhibit 29—Annual Report of The United Electric Coal Companies 1964 1776

Nugent Deposition Exhibit 35—Invitation for Tenders of Common Stock of The United Electric Coal Companies by General Dynamics Corporation dated October 5, 1966 1786

Nugent Deposition Exhibit 38—Map entitled "Shipping Coal Mines In Illinois" prepared by Jack A. Simon, State of Illinois, Department of Registration and Education, State Geological Survey, dated January 1, 1966 1793

Nugent Deposition Exhibit 39—Letter from Tom Tarzy to Frank Nugent dated December 11, 1964 and Chart Showing Midwestern Coal Consumption by Utility Plants, 1963 1794

Nugent Deposition Exhibit 49—Minutes of The United Electric Coal Companies Board of Directors Meeting held October 28, 1960 re Capital Appropriation for UEC 1796

Nugent Deposition Exhibit A—Letter from Frank Kolbe to Henry Crown dated October 9, 1956 1797

Deposition Exhibits:—Continued Page

Pedersen Deposition Exhibit 5—United Electric Coal Companies Computation of Provision for Federal Income Taxes, Month of October 1966 and Ten Months Ended October 31, 1966 ____ 1800

Redard Deposition Exhibit 1—Keystone Steel and Wire Company letter to Department of Justice dated April 26, 1968 ____ 1808

Simon Deposition Exhibit 1—Simon, J.A., An Evaluation of Illinois Coal Reserve Estimates, 1968 ____ 1810

Sloane Deposition Exhibit 1—Unsigned letter from the Secretary of the United Coal Companies to Mr. Robert S. Overbeck dated January 21, 1963 ____ 1821

Steiner Deposition Exhibit 1—VITA, Peter O. Steiner dated August, 1969 ____ 1823

Steiner Deposition Exhibit 2—*U.S.* v. *General Dynamics, et al.*, Memorandum of Expected Testimony of Peter O. Steiner, Professor of Economics and Law, University of Michigan dated August 14, 1969 ____ 1828

Terleke Deposition Exhibit 2—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1957-1958 ____ 1837

Terleke Deposition Exhibit 11—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1966-1967 ____ 1841

Weir Deposition Exhibit 1—Shipping Coal Mines (Map), Illinois, Indiana, West Kentucky. ____ 1845

Weir Deposition Exhibit 8—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated August 5, 1959 ____ 1846

Weir Deposition Exhibit 19—Brochure entitled "Paul Weir Company" ____ 1847

GENERAL DYNAMICS CORPORATION AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEET

Assets	1960	1959
CURRENT ASSETS:		
Cash	$ 51,009,386	$ 66,301,747
Marketable securities, at cost	2,173,470	3,348,623
Accounts receivable—United States and Canadian Governments	24,583,768	30,103,221
Other trade receivables, less reserves	72,850,254	51,618,615
Refundable United States income taxes	25,300,000	—
Unreimbursed expenditures and estimated profits principally on aircraft and ship contracts in process	233,850,589	279,635,448
Inventories, at the lower of cost or market, less advance and progress payments	210,951,625	205,589,099
Prepaid expenses	5,446,641	3,538,522
Total current assets	$626,165,733	$840,145,435
OTHER ASSETS:		
Investments (at cost) and advances, including unconsolidated subsidiaries of $3,973,413 in 1960 and $3,947,276 in 1959	$ 15,398,525	$ 14,519,193
Receivables not currently due and other assets including used aircraft (at cost less reserves)	9,393,979	23,716,878
	$ 24,792,504	$ 38,236,071
PROPERTY, PLANT AND EQUIPMENT, at cost:		
Land and buildings	$129,999,721	$123,890,642
Machinery and equipment	232,226,643	204,053,238
	$362,226,364	$327,943,880
Less—Depreciation, amortization and depletion	170,768,853	145,031,137
	$191,459,511	$182,912,743
	$842,387,748	$861,294,249

The accompanying notes are an integral part of the above statement.

GENERAL DYNAMICS CORPORATION AND SUBSIDIARIES

STATEMENT OF CONSOLIDATED INCOME
FOR THE YEARS ENDED DECEMBER 31, 1980 AND 1979

	1980	1979
NET SALES	$1,987,748,715	$1,811,871,384
COST OF SALES	2,041,097,987	1,754,948,587
Profit (loss) from operations	($ 53,349,272)	$ 56,922,797
OTHER INCOME (EXPENSE):		
Interest—net	($ 12,541,658)	($ 6,205,385)
Miscellaneous—net	4,120,079	3,438,657
	($ 8,421,579)	($ 2,766,728)
Profit (loss) before income taxes	($ 61,770,851)	$ 54,156,069
PROVISION (CREDIT) FOR UNITED STATES AND CANADIAN INCOME TAXES	(34,715,000)	23,100,000
Net income (loss)	($ 27,055,851)	$ 31,056,069

The accompanying notes are an integral part of the above statement.

* * *

* * *

GENERAL DYNAMICS CORPORATION AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEET

Assets	1961	1960
CURRENT ASSETS:		
Cash	$ 56,207,554	$ 51,008,398
Marketable securities, at cost	4,372,472	2,173,470
Accounts receivable—United States and Canadian Governments	31,513,107	24,583,798
Other trade receivables, less reserves	75,948,074	72,850,254
Refundable United States income taxes	28,227,375	25,300,000
Unreimbursed expenditures and estimated profits on cost reimbursement and long-term contracts in process	220,910,184	232,950,589
Inventories, at the lower of cost or market, less advance and progress payments	175,870,480	285,008,504
Prepaid expenses	4,115,205	5,446,841
Total current assets	$597,365,941	$701,341,013
OTHER ASSETS:		
Investments (at cost) and advances, including unconsolidated subsidiaries of $4,616,270 in 1961 and $2,973,419 in 1960	$ 13,007,839	$ 15,266,525
Receivables not currently due and other assets	13,280,650	8,368,979
	$ 26,288,489	$ 24,702,504
PROPERTY, PLANT AND EQUIPMENT:		
Land and buildings, at cost	$140,946,706	$129,900,721
Machinery and equipment, at cost	249,756,465	232,238,843
	$390,703,171	$362,239,564
Less—Depreciation, amortization and depletion	197,879,711	170,788,853
	$192,823,460	$191,450,511
	$816,367,290	$917,493,027

The accompanying notes are an integral part of the above statement.

GENERAL DYNAMICS CORPORATION AND SUBSIDIARIES

STATEMENT OF CONSOLIDATED INCOME
FOR THE YEARS ENDED DECEMBER 31, 1961 AND 1960

	1961	1960
NET SALES	$2,002,377,098	$1,987,748,715
COST OF SALES, including losses (unrecoverable costs) on commercial jet transport program of $214,488,000 in 1961 and $167,194,000 in 1960	2,220,150,110	2,041,097,987
Loss from operations	$ 157,772,112	$ 53,349,272
OTHER EXPENSE (INCOME):		
Interest—net	$ 12,900,570	$ 12,541,658
Miscellaneous—net	(2,605,828)	(4,120,079)
	$ 10,294,742	$ 8,421,579
Loss before income taxes	$ 168,066,854	$ 61,770,851
CREDIT (PROVISION) FOR UNITED STATES AND CANADIAN INCOME TAXES:		
Credit applicable to General Dynamics Corporation resulting from loss carryback	$ 28,227,275	$ 36,948,901
Provision applicable to profits of subsidiaries consolidated	(3,363,880)	(2,233,901)
	$ 24,863,395	$ 34,715,000
Net loss	$ 143,203,459	$ 27,055,851

The accompanying notes are an integral part of the above statement.

* * *

* * *

GENERAL DYNAMICS CORPORATION AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEET

Assets	1962	1961
CURRENT ASSETS:		
Cash	$ 35,423,469	$ 56,307,554
Marketable securities, at cost	9,620,912	4,372,472
Accounts receivable — United States and Canadian Governments	21,193,807	31,513,107
Other trade receivables, less reserves	66,697,118	75,949,074
Refundable United States income taxes	—	28,227,275
Unreimbursed expenditures and estimated profits on cost reimbursement and long-term contracts in process	187,704,789	220,910,194
Inventories, at the lower of cost or market, less advance and progress payments	138,040,674	175,870,460
Prepaid expenses	4,795,436	4,115,205
Total current assets	$463,476,205	$597,265,341
OTHER ASSETS:		
Investments (at cost) and advances, including unconsolidated subsidiaries of $4,536,370 in 1962 and $4,616,370 in 1961	$ 12,916,212	$ 13,007,639
Receivables not currently due and other assets, less reserves	8,489,985	13,260,850
	$ 21,406,197	$ 26,268,489
PROPERTY, PLANT AND EQUIPMENT:		
Land and buildings, at cost	$141,638,816	$140,946,706
Machinery and equipment, at cost	264,893,877	249,756,465
	$406,532,693	$390,703,171
Less—Reserves for depreciation, etc.	235,743,355	197,879,711
	$170,789,338	$192,823,460
	$655,671,740	$816,357,290

The accompanying notes are an integral part of the above statement.

* * *

GENERAL DYNAMICS CORPORATION
AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEET DECEMBER 31, 1963 AND 1962

Assets	1963	1962
CURRENT ASSETS:		
Cash	$ 36,600,960	$ 35,423,469
Marketable securities, at cost	9,380,656	9,620,912
Accounts receivable—United States and Canadian Governments	19,726,394	21,193,807
Other trade receivables, less reserves	57,796,980	66,697,118
Unreimbursed expenditures and estimated profits on cost reimbursement and long-term contracts in process (Note 3)	158,560,260	187,704,789
Inventories, at the lower of cost or market, less advance and progress payments	134,544,485	138,040,674
Prepaid expenses	4,348,986	4,795,436
Total current assets	$418,998,701	$463,476,205
OTHER ASSETS:		
Investments (at cost) and advances, including unconsolidated subsidiaries of $4,902,153 in 1963 and $4,536,370 in 1962 (Note 7)	$ 8,820,192	$ 12,916,212
Receivables not currently due and other assets, less reserves	8,436,121	8,489,985
	$ 17,056,313	$ 21,406,197
PROPERTY, PLANT AND EQUIPMENT (Note 8):		
Land and buildings, at cost	$148,847,504	$141,638,816
Machinery and equipment, at cost	329,472,919	264,893,877
	$478,320,423	$406,532,693
Less—Reserves for depreciation, etc.	288,217,747	235,743,355
	$190,102,676	$170,789,338
	$626,147,690	$655,671,740

The accompanying notes are an integral part of the above statement.

* * *

CONSOLIDATED BALANCE SHEET December 31, 1964 and 1963

Assets	1964	1963
Current Assets:		
Cash	$ 33,849,501	$ 36,600,960
Marketable securities, at cost	28,917,406	9,380,656
Accounts receivable—United States and Canadian Governments	12,092,289	19,725,394
Other trade receivables, less reserves	74,959,608	57,799,980
Unreimbursed expenditures and estimated profits on cost reimbursement and long-term contracts in process (Note 1)	136,608,996	156,590,280
Inventories, at the lower of cost or market, less advance and progress payments	116,610,178	134,544,465
Prepaid expenses	4,303,200	4,346,966
Total current assets	$407,141,178	$418,988,701
Other Assets:		
Investments (at cost) and advances, including unconsolidated subsidiaries of $4,981,250 in 1964 and $4,902,153 in 1963 (Note 6)	$ 8,792,302	$ 8,620,192
Receivables not currently due and other assets, less reserves	14,236,249	8,436,121
	$ 23,028,551	$ 17,056,313
Property, Plant and Equipment (Note 7):		
Land and buildings, at cost	$154,524,777	$148,847,504
Machinery and equipment, at cost	350,501,808	329,472,919
	$505,026,585	$478,320,423
Less—Reserves for depreciation, etc.	312,140,466	288,217,747
	$192,886,119	$190,102,676
	$623,055,848	$626,147,690

The accompanying notes are an integral part of the above statement.

* * *

* * *

Consolidated Balance Sheet December 31, 1965 and 1964

Assets	1965	1964
Current Assets:		
Cash	$ 14,553,533	$ 33,849,501
Marketable securities, at cost	8,415,627	28,917,408
Accounts receivable — United States and Canadian Governments	22,562,514	12,092,289
Other trade receivables, less reserves	85,770,215	74,959,606
Unreimbursed expenditures and estimated profits on cost reimbursement and long-term contracts in process (Note 1)	136,700,014	136,406,996
Inventories, at the lower of cost or market, less advance and progress payments	155,460,411	116,610,178
Prepaid expenses	5,920,741	4,303,200
Total current assets	$429,383,055	$407,141,178
Other Assets:		
Investments in and advances to unconsolidated subsidiaries (Note 5)	$ 12,371,467	$ 4,981,250
Receivables not currently due and other assets	18,511,400	18,047,301
	$ 30,882,867	$ 23,028,551
Property, Plant and Equipment (Note 6):		
Land and buildings, at cost	$155,960,368	$154,524,777
Machinery and equipment, at cost	386,159,006	350,501,808
	$542,119,374	$505,026,585
Less — Reserves for depreciation, etc.	331,959,343	312,140,466
	$210,160,031	$192,886,119
	$670,425,973	$623,055,848

The accompanying notes are an integral part of the above statement.

* * *

* * *

* * *

Consolidated Balance Sheet December 31, 1966 and 1965

Assets	1966	1965
Current Assets:		
Cash	$ 16,280,552	$ 14,553,535
Marketable securities, at cost	2,307,155	8,[illegible]5,627
Accounts receivable—United States and Canadian Governments	38,526,599	22,562,514
Other trade receivables, less reserves	76,751,642	85,770,215
Unreimbursed expenditures and estimated profits on cost reimbursement and long-term contracts in process (Note 1)	181,192,092	136,700,014
Inventories, at the lower of cost or market, less advance and progress payments	137,563,138	155,460,411
Prepaid expenses	5,879,986	5,920,741
Total current assets	$458,303,564	$429,383,055
Other Assets:		
Equity in net assets of unconsolidated subsidiaries (Note 5)	$ 13,018,123	$ 12,371,487
Receivables not currently due and other assets	24,459,928	18,511,400
	$ 37,478,051	$ 30,882,887
Property, Plant and Equipment (Note 6):		
Land and buildings, at cost	$167,616,215	$155,960,368
Machinery and equipment, at cost	429,898,744	386,159,006
	$597,514,959	$542,119,374
Less—Reserves for depreciation, etc.	359,760,529	331,959,343
	$237,754,430	$210,160,031
	$733,536,045	$670,425,973

The accompanying notes are an integral part of the above statement.

* * *

THE UNITED ELECTRIC COAL COMPANIES FIXED ASSETS, LONG-TERM INDEBTEDNESS, WORKING CAPITAL AND NET ASSETS OR STOCKHOLDERS' EQUITY 1940-1967

GOVERNMENT EXHIBIT 24

Fiscal Year Ending or Period Ending	Coal Lands, Plant and Equipment, Less Reserves for Depreciation and Depletion	Long-Term Indebtedness	Working Capital	Net Assets or Stockholders' Equity
	$	$	$	$
1940	7,568,444	2,435,978	479,528	6,220,708
1941	8,621,986	2,325,574	317,454	6,415,729
1942	8,232,506	1,332,925	522,104	7,149,970
1943	7,804,045	452,502	723,245	7,892,886
1944	7,417,505	66,148	1,338,388	8,384,099
1945	7,608,466	115,876	1,681,093	9,034,787
1946	8,421,680	2,752,575	1,507,546	9,051,358
1947	10,359,132	3,100,315	1,412,803	9,429,964
1948	12,057,741	2,233,277	2,015,985	11,925,909
1949	12,500,250	1,289,995	2,142,937	13,501,152
1950	12,490,041	683,387	2,274,161	14,346,913
1951	12,257,777	64,085	2,933,432	15,432,881
1952	12,471,605	--	2,683,703	15,606,211
1953	13,537,046	1,572,000	3,906,202	16,335,853
1954	14,119,259	1,558,000	3,488,426	16,364,115

Fiscal Year Ending or Period Ending	Coal Lands, Plant and Equipment, Less Reserves for Depreciation and Depletion	Long-Term Indebtedness	Working Capital	Net Assets or Stockholders' Equity
	$	$	$	$
1955	13,704,308	573,199	2,516,334	16,371,127
1956	13,204,764	--	3,179,295	17,354,763
1957	13,298,913	180,000	3,438,544	18,500,970
1958	15,361,414	--	2,538,648	18,894,110
1959	16,684,704	1,200,000	2,772,358	19,627,151
1960	20,105,940	3,380,502	3,026,638	20,411,351
1961	20,334,453	2,442,545	3,284,855	21,962,932
1962	21,140,096	1,929,701	3,190,428	23,272,504
1963	21,582,653	515,599	2,880,987	24,703,850
1964	20,596,624	--	6,795,011	28,147,321
1965	20,277,196	--	8,369,428	29,402,009
9/30/66	18,794,232	--	11,134,822	30,682,939
1966	18,448,086	--	3,461,975	22,663,946
1967	17,619,538	--	5,877,523	24,249,446

Sources: 1949 Annual Report of UEC (Kolbe deposition Exhibit 52) for the years 1940-1949; 1959 Annual Report of UEC (Kolbe deposition Exhibit 5) for the years 1950-1959; 1965 Annual Report of UEC (Nugent Deposition Exhibit 31) for the years 1956-1965; the "Invitation for Tenders" (Nugent Deposition Exhibit 35a-35g) for 9/30/66; General Dynamics Corporation Balance Sheet for UEC dated December 31, 1966 (Nugent Deposition Ex. 36a) for 1966 and General Dynamics Corporation Balance Sheet for UEC dated December 31, 1967 (Nugent Deposition Exhibit 37a) for 1967.

THE UNITED ELECTRIC COAL COMPANIES

NET SALES, EARNINGS BEFORE INCOME TAXES, NET EARNINGS, AND NET EARNINGS AS A PERCENTAGE OF NET SALES
1940-1968

GX 25

Year	Net Sales	Earnings Before Income Taxes	Net Earnings	Net Earnings as a Percentage of Net Sales
1940	$ 3,273,881	$ 205,932	$ 174,432	5.33
1941	4,129,483	412,934	364,834	8.83
1942	5,707,451	976,596	731,596	12.82
1943	5,478,425	1,187,133	742,133	13.55
1944	6,682,975	1,637,208	837,208	12.53
1945	6,881,203	1,784,790	904,790	13.15
1946	6,467,000	764,790	566,571	8.76
1947	8,247,871	1,339,305	928,605	11.26
1948	13,620,152	4,890,545	3,183,445	23.37
1949	14,481,307	3,994,443	2,537,743	17.52
1950	10,556,660	1,922,511	1,137,511	10.78
1951	16,488,426	3,921,338	2,076,338	12.59
1952	13,470,364	2,088,470	1,529,170	11.35
1953	14,742,135	2,132,562	1,470,562	9.98
1954	13,000,509	1,021,182	706,182	5.43
1955	12,476,899	897,332	684,932	5.49
1956	14,960,424	2,311,556	1,661,556	11.11
1957	16,300,572	3,004,006	2,044,006	12.54
1958	15,454,725	2,335,664	1,548,664	10.02
1959	15,770,289	2,611,313	1,811,313	11.49
1960	16,021,572	2,342,472	1,862,472	11.62
1961	18,135,466	3,629,853	2,629,853	14.50
1962	19,055,659	3,505,236	2,455,236	12.88
1963	19,904,586	3,529,402	2,644,402	13.29
1964	23,195,866	5,053,676	3,478,676	15.00
1965	21,803,576	3,417,744	2,467,744	11.32
1966	23,890,513	5,479,630	3,679,630	15.40
1967	23,395,820	4,238,499	3,085,499	13.19
1968	To be supplied on receipt of information			

Sources: UEC's 1949 Annual Report (Kolbe Deposition Exhibit 52) for the years 1940 through 1949; UEC's 1958 Annual Report (Kolbe Deposition Exhibit 4) for the years 1949 through 1958; UEC's 1965 Annual Report (Nugent Deposition Exhibit 31) for the years 1959 through 1965; Nugent Deposition Exhibit 36b for 1966 and Nugent Deposition Exhibit 37b for 1967.

GOVERNMENT EXHIBIT
26

FEATURES

	Page
Bituminous	66
Demand	67
Utility	67
Nuclear Power	69
Steel Industry	69
Other Industrial	70
Railroad & Retail	70
Export Markets	70
Prices; Contracts	70
Production	71
Types of Coal	71
Productivity	72
Transportation	73
Leading Producers	73
Reserves	74
Labor Relations	74
Anthracite	74
Composite Ind. Data	75
Company Analysis	76
Stock Price Chart	77
Statistical Data	79
Preferred Stocks	80

PAGE C 65

—Basic Analysis—

April 28, 1966 (Section 2)

Discard Basic Analysis dated April 29, 1965.

Standard & Poor's

INDUSTRY SURVEYS

Utilities Provide Growing Market for Bituminous

BITUMINOUS (soft) coal is a vital factor in industrial progress, even though competition from other fuels and changing technologies have reduced or practically eliminated demand in some formerly important markets and current output is some 19% below the record high achieved shortly after World War II. In recent years, demand has been trending upward. Production in 1965 was the largest since 1951 and further gains seem likely.

Coal is the principal fuel used in generating the tremendous quantities of low-cost electric power so necessary for industry, commerce, and a high standard of personal living. It is an indispensable element in large-scale economic production of steel, cement, and many chemicals. It is one of the few natural resources in which the United States is still a net exporter because of extensive reserves and comparatively cheap mining costs.

Coal's major and growing market is the electric power industry, where the fuel is burned to produce steam that in turn drives electrical generators. Electric utilities used 3.5 times more coal in 1965 than at the end of World War II. The sizable increase in demand for electric power projected through 1980 is expected to result in substantial further growth in coal usage, despite competition in some areas from oil, natural gas, and atomic power.

The longer-range threat to soft coal posed by nuclear power generation is expected to be greatest in areas remote from mine fields, where heavy transportation costs diminish coal's competitive advantage. On an overall basis, atomic power seems likely to supplement coal, rather than displace it entirely.

The impact of growing usage of coal in the utility field has been lessened by losses in other markets, particularly railroads and home heating where coal usage has contracted to such an extent that future declines will be relatively small. The steel industry is expected to remain a major consumer, but gains in blast furnace efficiency may offset the effects of a

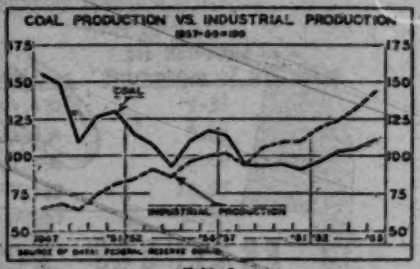


Table 1

INDUSTRIAL PRODUCTION VS. COAL PRODUCTION

In Relatives, 1957-59=100

	Total Ind. Prod.	Coal		Total Ind. Prod.	Coal		Total Ind. Prod.	Coal
1935	143.2	111.9	1951	169.7	98.1	1967	168.7	113.4
1944	193.3	107.1	1960	108.7	88.7	1968	92.9	117.1
1945	191.5	102.5	1950	165.9	102.7	1969	94.6	108.5
1947	113.3	98.3	1966	92.7	92.4			

Source: Federal Reserve Board.

Table 2

STEAM-ELECTRIC PLANT FUEL CONSUMPTION, BY REGIONS

	*New England	*Middle Atlantic	*East North Central	*West North Central	*South Atlantic	*East South Central	*West South Central	*Mountain	*Pacific	Total United States	*Coal Consumption by States	Cost per Million B.t.u. Total United States	Cost per Million B.t.u. Coal Consumption by States
	Thousand of Tons											Cents	
Coal													
1964	8,597	60,758	81,259	12,749	39,392	23,905	10	6,644	——	224,197	223,740	24.6	24.5
1965	7,508	58,008	84,793	13,520	34,953	21,674	35	5,281	——	226,320	207,135	25.0	24.0
1966	7,128	54,291	78,778	12,359	32,955	27,565	——	4,724	——	191,560	188,425	25.6	25.6
1967	6,834	51,656	69,844	10,319	30,858	27,466	36	3,975	——	182,092	180,561	25.8	25.8
1968	5,831	51,637	63,115	8,328	28,650	25,958	——	3,723	——	174,918	172,526	25.8	25.8
1969	5,638	51,963	60,379	6,878	28,539	23,629	1	3,503	——	165,651	164,576	24.5	24.5
1970	5,786	50,900	61,872	7,869	27,700	21,543	1	1,378	——	182,514	151,304	27.4	27.3
Oil (Coal Equivalent)													
1964	4,671	8,487	82	110	6,117	16	22	421	4,520	24,479	13,918	22.6	22.5
1965	4,709	7,719	77	103	5,177	23	22	441	4,256	22,542	12,813	23.5	23.3
1966	4,528	7,185	74	122	4,650	16	27	480	4,502	21,681	12,561	24.5	24.3
1967	4,179	6,569	69	88	3,564	17	28	601	4,419	21,737	11,516	25.5	24.4
1968	4,126	6,161	76	101	3,214	21	29	659	4,457	21,149	11,161	24.5	24.1
1969	4,597	6,435	85	87	3,664	22	23	648	5,523	20,866	11,613	25.2	25.4
1970	3,291	5,101	45	59	4,189	21	20	491	4,615	18,350	8,562	29.6	29.0
Gas (Coal Equivalent)													
1964	317	4,750	3,173	12,437	5,085	2,731	48,151	8,995	21,797	96,699	28,655	25.3	24.8
1965	476	4,839	3,191	11,427	5,371	2,574	37,081	8,714	17,589	89,764	28,624	25.5	24.4
1966	394	4,597	2,919	10,729	5,424	2,559	32,892	6,295	17,791	83,602	24,876	24.6	23.1
1967	374	3,562	2,621	10,711	5,447	2,548	28,708	8,580	17,694	79,144	23,947	25.1	23.1
1968	513	3,877	2,814	9,204	5,782	2,559	27,003	8,575	14,915	75,677	22,529	27.9	24.6
1969	491	4,250	3,152	8,419	4,923	2,266	24,972	4,674	12,367	64,677	21,530	27.3	25.9
1970	821	3,830	2,323	7,850	2,587	2,125	23,534	2,897	8,903	54,830	19,749	28.7	25.9

Note: Unit figures may not add to total because of rounding.

*Conn., Maine, Mass., New Hamp., R.I., Vt. *N.J., N.Y. State & City, Penna. (incl. Phila.). *Ill., Ind., Mich., Ohio, Wisc. *Iowa, Kan., Minn., Mo., Neb., No. & So. Dakota. *Del., D.C., Fla., Ga., Md., No. & So. Car., Va., West Va. *Ala., Ky., Miss., Tenn. *Ark., La., Okla., Texas. *Ariz., Colo., Mont., Nev., New Mex., Utah, Wyo. *Calif., Ore., Wash. *Excludes Fla., Miss., Ariz., and the West South Central and Pacific Regions.

Source: National Coal Association.

moderate rise in steel production and the increase in blast furnace output demanded by newer steelmaking furnaces. Foreign markets hold some promise as a sizable but volatile outlet for metallurgical grade coal, since the U.S. product is fairly essential to steel producers in Canada, Europe, South America, and Asia.

On balance, substantially higher production of bituminous is indicated over the longer term, spurred mainly by increasing usage of electric utilities. By 1980, domestic coal output could approach 800 million tons, well above the record 631 million tons of 1947 and some 57% higher than in 1965.

Obviously, coal companies shipping most of their tonnage to electric utilities have the greatest future potentials. The mines best situated in this respect are in the east-central and central United States, where potential new demand is sizable and where the proximity of coal deposits, the availability of cheap transportation on inland waterways, and favorable mining factors enhance coal's competitive position.

Technology

Technological progress has sharply reduced some coal markets while other developments have enhanced the fuel's position. The most significant technical gains for coal have been the increasing efficiency of steam boilers and rising productivity in the mines. In 1945, utilities used an average of 1.3 pounds of coal to generate one kilowatt of electric power. By 1965, this ratio had been reduced to 0.86 of a pound. A further decline is possible as new and more efficient generating plants are placed in operation, but this increasing efficiency is expected to continue to be substantially outweighed by the expansion of power generation, which in turn is stimulated by the reduction in electric power costs to the consumer.

As to mining efficiency, daily output per man rose from 5.78 tons in 1945 to almost 17 tons in 1964. (Table 12). Further gains are indicated with increasing usage of continuous mining machines in underground operations and larger equipment in strip mines, as well as the increasing proportion of coal mined by more efficient strip and auger methods.

The most important technological advance in recent years has been in the area of new transportation concepts. The early stimulus of coal slurry pipelines and, more recently, unit and integral railroad trains and extra high voltage electric transmission lines have served to reduce the delivered costs of this bulky commodity. Extension of these and other new ideas seems likely to continue to cut future transportation costs. The position of coal may also be eventually improved by commercial conversion of coal into gasoline, pipeline gas, and other petroleum products, all of which are technically feasible.

Under the auspices of the Office of Coal Research of the Department of the Interior, Consolidation Coal is constructing pilot plants for the production of gasoline from bituminous coal and pipeline gas from lignite. Substantial research is being conducted in other areas by government agencies, industry associations, and individual companies, all aimed at developing new markets for coal.

Utility Demand

Electric utilities, which furnish the fastest growing mass market for soft coal, used about 243 million tons of bituminous in 1965, equal to 53% of total domestic consumption. Electric utility demand increased about 57% in the past ten years, while total domestic usage rose only 6%, mainly reflecting sharply reduced consumption by railroads and retail consumers and a moderate decline in coal needs of industrial customers. Utilization of coal for power generation increased in every postwar year, except

Table 3
***SOURCES OF ENERGY IN THE U. S.**

	Anthracite Coal	Bituminous Coal	Total Coal	Crude Petroleum	Natural Gas	Total Oil & Gas	Water Power
P1965	0.9%	26.6%	27.4%	22.0%	25.4%	47.4%	4.7%
1964	0.9	26.8	27.8	23.6	24.9	48.5	4.7
1963	1.0	26.0	27.0	24.6	25.5	50.1	4.9
1962	1.0	25.3	26.3	24.4	24.3	48.7	4.9
1961	1.0	25.0	26.0	23.9	23.9	47.8	4.1
1960	1.1	24.1	25.2	23.8	23.2	47.0	3.8
1950	1.5	26.4	27.9	20.3	20.1	40.4	3.8
1958	1.4	27.5	28.9	20.3	20.3	40.6	4.0
1957	1.5	30.0	31.4	21.3	20.4	41.7	4.3
1956	1.8	32.1	33.9	21.3	20.4	41.7	3.8
1955	1.7	31.3	33.0	21.1	20.3	41.4	3.7

*Water power at constant fuel equivalent: anthracite—13,700 B.t.u. per pound; bituminous coal—13,100 B.t.u. per pound; crude petroleum, 5,800,000 B.t.u. per barrel; and natural gas, dry, 1,000 B.t.u. per cubic ft. (includes nuclear power (one tenth of one percent each year), beginning 1962.
Source: U. S. Bureau of Mines.

Table 4
PRODUCTION AND VALUE AT THE MINES

	—Bituminous Coal— Production 1,000 Tons	Value $1,000	—Anthracite— Production 1,000 Tons	Value $1,000
P1965	510,000	2,929,500	6,444	———
1964	486,998	2,795,513	17,164	146,618
1963	459,908	2,612,500	16,567	142,502
1962	422,149	2,391,264	16,894	134,004
1961	402,977	2,344,363	17,446	140,525
1960	415,512	2,366,420	18,817	147,116
1959	412,028	2,345,607	20,640	172,250
1958	416,446	2,392,531	21,171	177,099
1957	462,701	2,704,466	25,233	227,714
1956	500,874	2,912,601	28,320	255,795
1955	464,653	2,682,981	25,705	236,697

P—Preliminary.
Source: U. S. Bureau of Mines.

Table 5
FUEL ECONOMY IN CONSUMPTION OF COAL

	Electric Utility Pounds of Fuel per K.w.h.	Pounds of Coke per net Ton of Pig Iron Produced		Electric Utility Pounds of Fuel per K.w.h.	Pounds of Coke per net Ton of Pig Iron Produced
1945	0.86		1959	0.89	1,570
1964	0.86	1,516	1958	0.90	1,526
1963	0.86	1,525	1957	0.92	1,654
1962	0.86	1,580	1956	0.94	1,760
1961	0.86	1,616	1955	0.95	1,748
1960	0.86	1,656			

Source: Federal Power Commission and American Iron & Steel Institute.

1946 and 1949, when strikes cut supplies, and 1958, when the recession and stiff competition from residual oil caused a moderate decline.

This national average conceals wide geographical differences. As indicated in Table 2, growth in electric utility usage in recent years was greatest in the East Central districts and in the South Atlantic states, where coal encounters the least competition from other fuels. While competition from residual oil continues to be strong, improved transportation concepts in both coal and electrical energy are currently allowing improvement in the Northeast; similar factors are also stimulating coal demand in the Mountain district.

Costs of fossil fuels per kilowatt hour average about 2.6 mills nationally, with coal slightly less, gas roughly the same, and oil at 3.5 mills. Hydroelectric power, when available, is generally somewhat cheaper. Compared with a decade ago, costs for coal have declined about 8%, oil costs are down about 10%, but the cost of gas has risen more than 25%.

As indicated by Table 2, natural gas is almost the exclusive fuel used in the Southwestern producing districts; usage in other districts is greatest in the summer, when heating demand is low and gas transmission companies offer utilities reduced prices to utilize pipeline capacity. Some domestic fuel oil is used in various producing districts, but a major part of the total supply is imported residual oil which is transported cheaply by water to both the East and West Coasts. Virtually no coal is used on the West Coast because of high transportatoin costs, but electric power generated at a coal fired plant in Nevada will be transported by high voltage lines to California beginning in 1970.

Quotas limit imports of residual oil, but these have been regularly increased in recent years and arguments for abandoning the quota system are gaining increasing support. Such a move would markedly increase competition from oil, particularly on the eastern seaboard.

Table 6

COAL SHIPMENTS IN 1961 BY TYPES OF MARKETS

	[1]Millions of Tons Shipped	Percentage breakdown by Markets: Electric Utilities	Coke	Other Indust.	Exports	Retail	Misc.
Industry	509.16	48	20	14	10	4	3
[2]Consolidation Coal	45.01	51	24	13	4	--	8
[2]East Gas & Fuel	17.10	[3]55		11	31	3	[4]
Island Creek Coal	21.00	41	15	30	7	6	1
Peabody Coal	56.00	73		[5]19	--	--	8
Pittston	13.61	42	35	17	10	--	--
United Electric	3.35	72	--	[6]23	--	--	4

[1]Includes output of jointly-owned mines. [2]Figures for companies include purchased coal, except in the case of Pittston, which are for the company only. [3]Market breakdown for 1962; latest reported. [4]Includes coking. [5]Great Lakes bunker fuel.

Source: Company reports.

Increases in steam boiler efficiency contributed to the modest decline in the cost of coal per KWH over the past ten years, along with improved mining methods and, more recently, reductions in freight rates. The amount of coal required to generate one KWH stood at 0.86 pounds in 1965, unchanged since 1961 but down from 0.95 pounds in 1955 and 2 pounds in 1925. Despite the absence of any appreciable change in this figure in recent years, eventual resumption of the longer-term down-trend is expected with the addition of new plants, most of which require less than 0.7 pounds per KWH.

Bituminous coal (together with a small tonnage of anthracite) accounted for 54% of total electric energy produced by utilities in 1965. Excluding hydroelectric plants, coal furnished 67% of power-generating requirements of utilities, with gas supplying 26% and oil 7%. Relative to oil and gas, coal's market position seems likely to be well maintained at least through 1980. Of the three fossil fuels, coal has the most favorable price trend and there is room for some doubt that reserves of gas and oil are sufficient to fill the anticipated sizable rise in utility fuel demand. However, after 1970, markets for all fossil fuels will probably be subject to some erosion from nuclear power (see below). Domestic generation of hydroelectric power may lose some of its position, due to exhaustion of available locations, although the possible importation of hydro-power from Canada could prove in part offsetting.

Table 7

CONSUMPTION OF BITUMINOUS COAL & LIGNITE BY CONSUMER CLASS

In Thousands of Net Tons

	[1]Electric Power Utilities	Bunker Fuel Foreign & Lake Vessels	[1]Railroad (Class I)	Manufacturing and Mining: Coke Oven & Steel Mills: Beehive Coke Plants	Coke Oven Coke Plants	Steel & Rolling Mills	Total	Cement Mills	Other Mfg. & Mining	Total	[2]Retail Dealer Deliveries	Grand Total
1945	242,709	638	N.A.	2,819	7,486	102,079	112,384	6,545	65,614	184,543	19,013	458,976
1950	322,078	711	N.A.	2,005	7,384	96,151	105,540	6,479	82,965	194,984	19,615	537,118
1955	392,055	670	N.A.	1,613	7,691	85,034	94,338	8,135	82,797	185,270	20,516	600,225
1960	388,055	670	N.A.	1,613	7,691	85,034	94,338	8,135	82,797	185,270	20,516	600,225
1961	390,873	687	N.A.	1,329	7,023	83,861	92,213	7,715	78,796	178,724	20,135	589,774
1962	394,573	687	N.A.	1,329	7,023	83,861	92,213	7,715	78,796	178,724	20,135	589,774
1963	429,629	720	N.A.	1,491	7,955	81,276	90,722	7,715	77,240	175,677	20,715	627,114
1964	473,679	720	N.A.	1,491	7,955	81,276	90,722	7,715	77,240	175,677	20,715	671,114
1965	478,955	800	7,000	1,827	7,354	84,597	93,778	8,214	78,167	180,659	20,405	680,459
1966	478,955	800	7,000	1,827	7,354	84,597	93,778	8,214	78,167	180,659	20,405	680,459
1967	503,255	800	7,000	1,827	7,354	84,597	93,778	8,214	78,167	180,659	20,405	704,759
1968	503,255	800	7,000	1,827	7,354	84,597	93,778	8,214	78,167	180,659	20,405	704,759
1969	503,255	800	7,000	1,827	7,354	84,597	93,778	8,214	78,167	180,659	20,405	704,759
1970	503,255	800	7,000	1,827	7,354	84,597	93,778	8,214	78,167	180,659	20,405	704,759
1975	553,505	855	3,725	1,017	7,545	81,545	90,107	8,205	81,312	179,624	20,719	753,953
1980	637,255	1,004	8,401	3,473	104,547	6,978	114,998	6,621	87,202	208,821	20,719	867,795
1985	734,255	1,179	12,208	4,042	101,570	7,180	112,792	9,804	90,240	212,836	20,719	967,810
1990	794,583	1,429	12,208	4,042	101,570	7,180	112,792	9,804	90,240	212,836	45,667	1,065,878
1995	794,583	1,429	12,208	4,042	101,570	7,180	112,792	9,804	90,240	212,836	45,667	1,065,878
2000	794,583	1,429	12,208	4,042	101,570	7,180	112,792	9,804	90,240	212,836	45,667	1,065,878

[1]Collected by the Federal Power Commission. [2]Collected by the Association of American Railroads. Includes bituminous coal for railroads uses; included in other manufacturing and mining after 1960. [3]Includes some coal shipped by truck from mine to final destination. Note: See Current Industry Surveys for later data. N.A.—Not available.

Source:—U. S. Department of Interior, Bureau of Mines.

The Federal Power Commission has estimated that output of electricity in 1980 will be slightly more than three times that of 1960. The consumption of coal by electric utilities is not expected to rise as rapidly, largely because of the increasing importance of nuclear power generation, as well as some further gains in steam plant efficiency. These factors are expected to reduce coal's market share to 47% in 1980, compared with 54% in 1965. Despite this erosion, it is readily evident that the potential for absolute growth is sizable. Utility coal usage is thus projected at 500 million tons in 1980, representing an annual increase of almost 5% from the 243 million tons of 1965. Current and planned additions to generating capacity reinforce this longer-range projection and enhance near-term prospects. New conventional steam generating capacity totaling 11 million kilowatts was added in 1965, and current plans call for the installation of an additional 37.6 million KW by 1969; the latter is equal to about 16% of the total installed generating capacity at the end of 1965.

Nuclear Power Generation

Nuclear power at present is not a significant factor in the total power generation industry, as it accounted for slightly less than 1% of the installed steam capacity at the end of 1965. Nor is it expected to seriously affect coal's growth in this market through the end of the present decade. However, recent projections of total operating costs for nuclear power installations indicate that, by 1980, nuclear power may become fully competitive at most locations with fossil fuels (coal, gas and oil) in the generation of electric power.

Nuclear power offers two significant potential advantages over conventional fossil fuels; the ability to produce large quantities of electric power from small amounts of fuel, thus allowing generating stations to be located closer to load centers due to the absence of sizable fuel transportation costs, and operation without discharge of combustion wastes that would contribute to air pollution.

Of the nuclear plants in operation now, the most successful is the Rowe, Mass., plant of the Yankee Atomic Electric Co., which has net power costs of slightly under 10 mills per kilowatt hour, above the cost obtainable from new conventional capacity in the same area. However, costs of the planned Oyster Creek plant of Jersey Central Power (to begin operation in 1968) are projected at 3.79 mills per KWH at peak operation, well below the costs of a coal-fired plant at the same location and slightly less than power transmitted to the area from a Pennsylvania mine-mouth station. Similarly, Commonwealth Edison's 200,000 kilowatt unit, planned to start up in 1969, is expected to deliver power to the Chicago area at costs slightly lower than those of the company's newest conventional coal-fired plant.

Estimates by the Federal Power Commission indicate that costs of nuclear power generation, which is expected to supply 19% of total electric power requirements in 1980, may decline to levels in that year equivalent to fossil fuel costs per KWH of 1.1 to 1.7 mills. There continues to be wide geographic disparity in the economic advantage of nuclear power relative to coal, and the type of new capacity installed in future will vary according to plant location, with the greatest initial growth in nuclear power use expected in such high-cost coal areas as the Pacific Coast, where relatively no coal is used, and the Northeast, where oil and gas have important shares of the market. Coal costs per KWH, which averaged 2.5 mills in 1964, seem likely to decline, reflecting further gains in mine efficiency and reductions in freight rates, thus providing a moving competitive target for nuclear power. As a result, many observers feel that atomic power will supplement rather than replace coal in utility markets.

Steel Industry Demand

Steel producers provide coal with its second largest market and consume over 90% of coking coal (excluding exports). Coals from Eastern fields varying in volatile content are blended by steel companies and then carbonized into coke for use in the blast furnaces which separate iron from the major impurities contained in iron ore. Under present technology, coal is indispensable for large-scale, economic production of most steel grades but gains in blast furnace efficiency have seriously reduced the amount of coal needed in the steelmaking process, as shown in Table 5 by the decline in coke consumption per ton of steel produced.

Further reductions in coal use per ton of pig iron produced seem inevitable, reflecting increased availability of concentrated iron ores and gains in blast furnace efficiency stemming largely from injection of lower cost fuels (oil, gas or powered steam coal) into the furnace.

Over-all, coke usage per ton of pig iron has declined by about 30% since 1949 and some industry experts believe that further reduction of up to 50% are possible. One favorable technological development has been the growing usage of basic oxygen

steelmaking facilities which utilize a larger proportion of pig iron relative to scrap than do regular open hearth furnaces. On a longer-range basis, direct reduction of iron ore may become economically feasible. This would further curtail steel industry consumption of coking coal although additional quantities of steam grades might be needed for the large power requirements of direct reduction processes.

In producing one ton of pig iron in a blast furnace, about 1,310 pounds of coke are used, which is equivalent to around 1,900 pounds of coking coal. Coal is also used by steel companies for heat and power but this usage accounts for less than one tenth of the industry's consumption. Many steel and coke producers operate their own mines. This "captive" production supplies approximately two-thirds of total coal requirements. When steel production declines, commercial coal operators generally are adversely affected first, although contract terms do result in variances among companies.

Other Industrial Demand

Reflecting the increased availability of natural gas and fuel oil, consumption by merchant (non-steel) coke producers of metallurgical grades and demand for steam coal by other industrial users has been in a general decline through most of the postwar period. Substantial improvement is possible in certain markets, however, highlighted by expansion of cement production and also the use of steam plants for producing power used by aluminum companies.

Railroad and Retail Demand

Before and during World War II, railroads and retail consumers each accounted for over 20% of total domestic consumption. With dieselization, coal now accounts for only a nominal portion of total railroad fuel requirements. Coal use by railroads fell 98% from 1945 to 1960, or from 22% of total consumption to 0.6%; because of its lack of importance in coal markets, rail consumption has not been reported separately since 1960. Utilization of more efficient fuels in home heating precipitated an 84% decline in retail consumption from 1945 to 1965; the retail market amounted to 4% of coal consumption in the more recent year, down from 21% in 1945.

Export Markets

Metallurgical grades (particularly low-volatile) accounts for about 62% of exported coal, and the cyclical nature of demand for this type of coal is made more volatile by changes in shipping rates, import restrictions, and foreign exchange considerations. In the postwar years, exports ranged from 5% of U.S. production in 1950 to 13% in 1957, and accounted for about 10% of output in 1965.

Table 8

U. S. EXPORTS OF BITUMINOUS COAL

In Thousands of Net Tons

	1957	1958	1959	1960	1961	1962	1963	1964	1965
No. & Central Amer.	10,352	12,386	12,476	11,702	11,520	11,474	12,520	13,516	13,727
Canada	19,433	12,558	12,467	13,853	11,369	11,110	12,767	11,787	13,661
South America	2,269	1,432	1,109	2,178	1,796	2,124	1,411	2,919	1,946
Brazil	1,049	878	881	1,043	878	1,216	1,134	1,191	1,210
Europe	49,791	29,849	19,125	16,984	13,249	14,214	20,216	25,092	21,852
Germany (West)	12,329	8,716	4,862	4,366	4,586	4,812	5,764	5,161	4,720
Italy	5,762	6,109	5,259	4,816	4,721	5,057	7,452	7,984	8,501
Netherlands	8,963	5,213	2,594	2,263	2,055	2,192	4,179	5,246	2,273
Asia	5,623	3,330	4,617	5,651	6,617	6,362	6,661	6,311	7,791
Japan	4,872	3,250	4,050	5,047	6,010	6,263	6,622	6,312	7,491
Africa	253	81	73	87	62	52	63	57	51
Total	78,410	59,636	52,867	56,459	49,573	51,432	60,578	65,869	59,061

Sources: Bureau of Mines and Bureau of the Census.

Canada has historically been the largest single foreign market for U. S. coal, and is expected to remain in this position for some time to come. However, with the increasing development of oil and natural gas resources and of pipeline networks, dependence on imports has lessened; in the past ten years, U.S. coal exports to Canada fell 24%. Overseas shipments hit a peak of 58 million tons in 1957, reflecting the fuel shortages stemming from the Suez crisis, but dropped sharply in 1958. However, shipments have trended generally upwards since 1960, amounting to 34.5 million tons in 1965. Countries in the European Common Market, which take about 42% of total exports, are the largest overseas outlet, followed in importance by Japan.

Most U.S. coal shipped to the Common Market is for metallurgical use, although some steam coal is also shipped and a fairly sizable portion of the metallurgical coal is gasified by gas utilities before the resultant coke is sold to steel makers. Even with the addition of ocean shipping rates to the U.S. prices, U.S. coal is often quite competitive with domestic coal in Europe, due to the low productivity of European mines (generally around 5 tons per man day, versus about 17 tons in the U.S.). However, to protect their producers from competition from imported coal and oil, most European nations have enacted stiff fuel import quotas, which have restricted this market for U.S. coal.

U.S. exports to Japan rose sharply in recent years, reflecting largely the growth in steel production there and limited domestic supplies. However, prospects for further expansion are not as bright, as the growth rate of the Japanese steel industry will probably decline, while lower transportation costs and the development of extensive reserves make coal from Australia increasingly attractive.

Prices; Contracts

The level of business activity, seasonal variations in demand, labor disturbances, and the availability of railroad cars cause fluctuations in coal prices. The price structure is based on the grade and quality as

well as the quantity taken. Prices of competing fuels are also important.

Coal is often sold to utilities under long-term contracts at fixed prices (with escalation clauses) or by some on a cost-plus basis. Long-term contracts are most important in the Midwest, with the contracts running to 20 years and over. Many eastern utility contracts are still on a annual basis, commencing in April, but longer terms are becoming more important and are often made in conjunction with arrangements with railroads for reduced rates on trainload lots.

In recent years, the price structure in eastern non-utility markets has been weakened by competition from non-union producers (whose low labor costs offset low productivity), residual fuel oil, and dump gas in the summer months (due to absence of space heating uses). In addition, metallurgical coal is often sold at reduced prices in steam markets when steel industry demand is low.

The rise in steel industry operating rates since 1963 and sharply higher utility demand allowed moderate price increases in eastern utility markets in early 1966. Midwestern prices continue firm, with competition coming mainly from gas. The absence of significant price increases has narrowed industry profit margins somewhat, but it has also allowed coal to win new customers in the electric utility industry. Large-scale producers have achieved a partial offset through increased mechanization; absence of labor cost increases in 1960-63 also aided in countering declining prices in those years.

Types of Coal

Coal, which constitutes 87% of the nation's proven fossil fuel reserves, is classified as anthracite, bituminous, subbituminous, and lignite. Anthracite, or hard coal, is nearly 90% carbon with only a small amount of volatile elements. Bituminous, with a lower fixed carbon content, is ranked as high, medium, or low-volatile, depending upon the proportion of bitumens or volatile elements which are released by heat. Subbituminous contains 15 to 30% moisture and has a lower B.t.u. content than bituminous. Lignite, the youngest coal geologically, has more volatile elements and moisture than any of the others and a lower carbon content. Lignite production is relatively small in the United States; in Europe, it is an important fuel.

Commercially, bituminous coal is rated as *metallurgical* and *steam* grades. Metallurgical coal (which is simply a coal that can be made into coke economically) softens and runs together when heated in a sealed oven. The volatile elements are driven off, leaving coke, a porous mass of nearly pure carbon (which produces a more intense heat than the volatile elements). In making coke, high volatile bituminous coal (averaging about 36% volatile matter) is usually blended with low volatile bituminous (about 18% volatile content), with low volatile accounting for 15%-20% of the total. However, medium volatile coal (about 26% volatile content) is fairly often used as part of the blend, and occasionally makes up the major part of it. Low volatile bituminous coal is relatively scarce, and often commands a premium price.

The main use for coke is in making pig iron, most of which, in turn, is converted into steel. Steam coal's principal use is in boilers, the energy produced being then directed to heating or processing. Metallurgical coal can be used in place of steam coal, although such substitution is costly; steam coal, however, cannot replace metallurgical grades.

Table 9
PRICES
In Dollars Per Ton

	*Average Value at Mines	Prices	Bituminous—Blue Ribbon Coal: Run of Mine	Bituminous—Blue Ribbon Coal: Prepared Sizes	Anthracite: Value at Mines	Bituminous—All Coal: Composite
1947	4.65	N.A.	4.73	6.82	—	22.89
1961	4.45	N.A.	4.39	6.50	8.65	22.50
1962	4.39	3.77	†4.73	†7.01	8.40	23.25
1963	4.43	3.75	4.52	7.33	8.54	23.61
1964	4.38	3.80	4.62	7.34	8.64	23.55
1965	4.42	3.67	4.54	7.29	8.75	23.45
1966	4.47	3.63	4.58	7.28	8.82	24.12
1967	4.46	3.58	4.61	7.24	8.83	24.38
1968	4.58	3.67	4.74	7.45	8.89	24.72
1969	4.62	3.69	4.82	7.58	8.89	25.15
1970	4.80	3.74	4.82	7.82	9.02	25.86

*Average price at mines includes the value placed on coal at the mines. This price is based on the value of all production of coal.

Note: See Current Industry Surveys for later data.
†Not strictly comparable with prior data beginning with 1962.
N.A. Not available.
Sources: U. S. Bureau of Mines and U. S. Bureau of Labor Statistics.

Table 10
CONSUMPTION, STOCKS, AND DAYS' SUPPLY OF BITUMINOUS COAL
In Millions of Net Tons

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
DOMESTIC CONSUMPTION													
1957	43.60	39.71	43.39	39.47	39.49	37.29	36.14	37.33	34.95	39.11	38.57	42.41	471.46
1961	39.73	36.36	38.43	35.46	35.71	33.52	33.17	33.62	31.24	35.11	34.47	41.83	428.65
1962	39.47	35.98	38.87	35.78	35.47	34.38	33.82	33.67	33.03	34.83	34.23	41.83	431.37
1963	39.61	35.68	38.77	36.87	39.83	34.61	33.51	33.87	32.27	34.55	33.81	39.71	437.09
1964	39.79	35.93	38.47	36.43	36.41	33.92	34.03	34.03	32.61	34.83	33.97	39.71	439.84
1965	39.17	34.31	38.16	36.93	36.47	35.24	34.43	34.43	32.62	34.16	34.05	41.29	441.46
1969	36.59	33.25	36.76	36.91	36.03	34.82	35.13	34.29	34.47	34.26	33.15	36.97	426.74
STOCKS—END OF PERIOD													
1957	78.41	67.34	61.82	61.49	64.03	71.42	63.15	63.81	70.42	72.69	72.22	71.28	—
1961	65.31	61.42	63.61	62.61	64.42	70.79	63.82	67.61	71.83	72.15	72.25	71.31	—
1962	63.88	59.47	59.82	59.78	61.55	67.61	63.32	67.88	69.75	72.71	73.28	74.66	—
1963	62.54	61.72	62.59	61.18	60.48	65.55	63.36	68.29	70.51	72.45	73.75	69.07	—
1964	63.15	62.32	61.78	61.81	61.00	70.78	68.41	68.41	70.74	72.61	73.85	71.45	—
1965	72.43	70.61	69.52	68.15	71.26	73.77	72.51	72.51	75.38	77.52	78.72	77.42	—
1969	71.39	68.17	68.47	67.71	67.46	71.67	71.67	69.69	69.33	71.84	71.62	68.39	—
DAYS' SUPPLY													
1957	52	53	51	52	52	56	55	55	60	56	57	52	53
1961	52	51	51	53	54	60	57	58	66	60	61	52	56
1962	51	51	50	52	53	58	57	58	64	60	61	52	55
1963	50	52	50	51	49	56	57	59	66	61	63	50	54
1964	50	52	49	51	50	60	61	59	65	61	63	50	54
1965	58	60	57	56	59	63	64	63	69	68	69	56	62
1969	58	58	56	56	57	61	63	61	60	63	65	56	60

Source: U. S. Bureau of Mines.

Productivity

Daily output per man amounted to 16.8 tons in 1964, and was probably in excess of 17 tons for all of 1965. Expanded utilization of continuous mining and loading machines has increased output per man-day by more than 11 tons since the end of World War II; in the period from 1900 to 1945, only 2.8 tons were added to daily productivity.

High wage rates are a strong incentive for increased usage of power cutters and drills, loading machines, and all types of conveyors and shuttle cars. The number of continuous mining machines in operation increased markedly in recent years; these now account for about 39% of total underground production and further increases are expected. Pick-and shovel mining has virtually disappeared from underground mines (except for small non-union operations) and now only about 4% of coal is cut by hand and only 12.5% is loaded non-mechanically.

Mechanization of mines has resulted in more foreign matter being mixed with coal. When most operations were performed by hand, miners separated non-coal elements. To overcome this problem, preparation plants now clean over 63% of total coal produced, compared with 28% in 1947 and 8% in 1930.

Productivity has always been high in strip mines because of the size of the equipment and the relatively few men needed for operations. Output rose from 15.5 tons per man day in 1945 to 29.3 tons in 1964, while underground productivity increased from 5 tons daily to 14 tons. Some strip mines have a production rate of above 50 tons per man. These mines are mostly in the Midwest, where lower grade coal requires higher productivity for profitable operations.

Underground Mines Vs. Strip Mines

Underground mines supplied 66% of total output in 1965, with strip and augur mines accounting for 31% and 3%, respectively. In underground mining, coal is cut, blasted loose with explosives or compressed air, loaded on conveyors or cars and carried up to the surface. Continuous mining machines and accessory equipment consolidate these operations and allow a more uninterrupted flow of coal from the mining faces as well as much higher productivity. In underground production, generally about 50% of the coal is left to support mine roofs; in some areas, better roof conditions allow removal of more than 80% of the coal.

Strip (open pit) mining consists of removing overburden from coal seams relatively close to the surface with huge electric shovels capable of moving up to 140 cubic yards of dirt and rock in one bite. Smaller power shovels load the coal (which is usually loosened by explosives) on trucks for removal to preparation plants or customers. Output of strip mines was relatively small until World War II. During the past decade stripping production, while somewhat erratic, displayed a moderate upward trend. Coal obtained by this method is generally a cheaper grade but nearly 100% of the seams can be recovered.

When the overburden in a strip mine gets too thick to be removed economically, augur methods are used. These consist of drilling large holes into coal beds with augurs. It is relatively inexpensive and permits recovery of up to 65% of the coal.

Table 12
SIGNIFICANT STATISTICS OF THE BITUMINOUS COAL INDUSTRY

	Average Number Working Daily	Production Per Man Per Day (Tons)	—Basic Wage Rates— Effective Date of Contract		[1]Daily Rate	[2]Royalty Payments
					Dollars	
1965	------	-----			[3]26.25	0.40
1964	129,695	16.84	April	1	[3]25.25	0.40
1963	141,616	15.82			24.25	0.40
1962	143,822	14.72			24.25	0.40
1961	150,474	13.87			24.25	0.40
1960	160,400	12.83			24.25	0.40
1959	170,626	12.12			24.25	0.40
1958	187,502	11.85	April	1	[3]24.25	0.40
1957	228,623	10.59	April	1	22.25	0.40
1956	228,153	10.38	Oct.	1	21.45	0.40
1955	226,088	9.84	Sept.	1	20.25	0.40
1954	211,598	9.47			18.75	0.40
1953	265,105	8.17			18.25	0.40
1952	333,217	7.47	Oct.	1	18.25	0.40

[1]Based on a 5-day week for an 8-hour underground day (portal to portal). [2]Payments per ton produced to United Mine Worker Welfare and Retirement Fund. [3]$1.20 of wage increase effective January 1 and $0.50 effective April 1, 1958. [4]Increases of $1 effective on April 1, 1964, and January 1, 1965, under 1964 contract.
Source: U. S. Bureau of Mines.

Table 13
ACTIVE BITUMINOUS COAL MINES

Annual Output—	1958	1959	1960	1962	1963	1964
200,000 tons & over	549	455	480	414	416	458
100,000-200,000	365	295	262	255	262	270
50,000-100,000	488	408	396	414	479	553
10,000- 50,000	2,112	2,149	2,162	2,301	2,250	2,299
1,000- 10,000	4,866	4,627	4,643	4,426	4,443	4,050
Total	8,520	8,264	7,845	7,740	7,940	7,630
% of output by mines over 100,000 tons	79.6	77.0	77.8	77.2	77.5	77.8
[1]Total Capacity— (million tons)	853	825	809	804	827	806

[1]Based on 260 days a year.
Source: U.S. Bureau of Mines.

Table 11
TONNAGE OF COAL HANDLED OR TREATED MECHANICALLY

	Bituminous			Anthracite	
	Mechanically Loaded Underground	Cleaned by Wet and Dry Methods	Strip Mining	Mechanically Loaded Underground	Strip Mining
	Thousands of Tons				
P1965	294,571	324,870	159,159	----	----
1964	261,101	310,398	151,859	2,455	7,177
1963	250,241	259,162	144,141	2,606	7,463
1962	240,920	271,483	150,300	2,065	6,822
1961	235,930	264,711	151,579	2,278	7,247
1960	245,784	273,129	152,530	4,044	7,112
1959	243,791	263,757	130,952	4,701	7,096
1953	242,572	259,025	118,242	5,332	6,878
1957	303,727	304,027	124,109	6,657	7,843
1956	307,602	320,235	127,056	7,378	8,354
1955	260,871	272,715	115,699	6,681	7,704

P Preliminary.
Source: U. S. Bureau of Mines.

Transportation Costs

Because of its bulk, costs of delivering coal to customers are an important part of total costs to the consumer. In 1965, the average value of coal at the mines was $4.45 a ton, but the average railroad freight charge added to the delivered cost was about two-thirds of this. Thus, a company could produce a higher grade of coal at a cheaper price than a competitor, but nearness to the ultimate consumer could allow the competitor to deliver his coal at a lower price per B.t.u., which is the chief determinant of fuel economy for a utility.

Close to 72% of the coal produced is moved from mines by rail. Shipments by water total only 12% of original movements but a substantial portion of coal is transferred to barges and other vessels before it reaches the ultimate user. Barge tows carrying up to 25,000 tons of coal ply the inland waterways, particularly the Monongahela, Allegheny, Kanawha, Ohio, and Mississippi Rivers. In addition, substantial tonnages are shipped over the Great Lakes and coastwise along the Atlantic seaboard. Over 13% of mine output is carried by trucks, particularly from strip and augur mines.

New Transportation Methods

To reduce or eliminate the sizable competitive disadvantage posed by the high costs of transporting coal from the mines to distant consumers, producers are striving to find cheaper methods of getting coal to its markets. At present, the most notable example is the reduced rail freight rates offered on whole train loads of coal moving from a single or small number of mines to a single utility. First used in 1962, train load methods provide cost savings of up to 20% and their use has been accelerating. More recently, the "unit" train concept has been initiated, wherein a train made up of cars owned by a utility or a coal producer operates between one mine and one generating plant. Special equipment allows rapid loading, unloading and turn-around time, and cost savings often amount to 50%. Even greater economies are expected from the planned "integral train", which will use permanently coupled large cars, heated and insulated and equipped for rapid loading and unloading. Planned train loads of up to 35,000 tons compare with the 7,000 to 10,000 ton capacities currently in use.

To avoid the cost of carrying coal in bulk form, some utilities are locating generating stations near the mines, and transmitting power over long distances. Power losses are a problem, but technological improvements often allow sizable savings. Such "mine-mouth" power plants are now coming into use in connection with regional power grids, which connect a number of utilities and allow power interchanges as well as the distribution of the power from the mine-mouth plants.

Table 11
PRODUCTION BY LEADING COMPANIES
In Millions of Tons
BITUMINOUS COAL PRODUCERS

	1962	1963	1964 Amt.	1964 % of Total	1965 Amt.	1965 % of Total
Bethlehem Steel	9.51	8.02	11.14	2.3%	----	----
*Consolidation Coal	25.61	28.62	45.41	9.4	48.64	9.5
Eastern Gas & Fuel	10.47	8.70	10.79	2.2	11.59	2.3
†Island Creek	24.15	20.69	21.01	4.4	21.00	4.1
Peabody Coal	21.50	20.20	44.50	9.6	48.50	9.6
Pittston Co.	10.29	12.63	13.43	2.8	13.61	2.7
U. S. Steel	22.98	14.50	17.00	3.5	15.00	3.5

*Includes output of jointly-owned mines.
†Includes West Kentucky Coal.
Source: Company reports.

Another method of coal transportation that has aroused considerable interest is the movement of a coal slurry (made up of coal and water) through a pipeline. One such pipeline was in successful operation in Ohio in 1957-63, and several others have been proposed in various parts of the country. However, the reduction in rail freight rates, which was the apparent cause of the Ohio pipeline shut-down in 1963, has stalled the installation of additional units in the East. In the West, however, a pipeline is being considered for transporting coal to a new generating complex in Nevada.

Leading Producers

Despite the concentration of mining in a few states, small companies operating only one or two mines are typical. Peabody Coal Co. and Consolidation Coal Co., the largest commercial producers, accounted for less than 10% each of total bituminous output in 1965. About 15% is produced by "captive" mines owned by steel companies, utilities, and other large coal users. U. S. Steel's mines produced 18 million tons in 1965, or 3.5% of total production.

Large mines account for a disproportionate share of total output. The latest available figures reveal that about 3% of the mines in operation produced more than 500,000 tons of coal annually and contributed 55% of total tonnage. Some 6% of the mines turned out 100,000 tons to 500,000 tons for 23% of national output; 37% produced 10,000 to 100,000 tons for 19%; and 53% of the mines dug less than 10,000 tons for 3% of overall production.

Increased capital needs for opening and mechanizing mines plus rising wage rates have resulted in a trend toward consolidations. With the economies offered by large-scale operations, further concentration is likely. The number of operating mines declined from a high of 9,400 in 1950 to 7,600 in 1965.

Reserves

Recoverable coal reserves in the U. S. were estimated at 830 billion tons in 1960, consisting of 455 billion tons of bituminous, 365 billion of subbituminous and lignite, and 10 billion anthracite. At the present rate of consumption, bituminous reserves would be sufficient for over 1,500 years and anthracite deposits for over 500 years. About 200 billion tons of total reserves are regarded as economically recoverable at or close to present costs. These deposits make up more than one-third of the world's presently recoverable supplies.

Practically all U.S. anthracite is located in Pennsylvania. Principal bituminous reserves ranked by size are in Illinois, West Virginia, Missouri, Pennsylvania, Kentucky, Colorado, Ohio and Indiana. However, in order of production, West Virginia is the leader with 30% of 1965 output, followed by Kentucky and Pennsylvania, 16% each, Illinois 11%, Ohio 8%, and Virginia 7%.

The principal deposits of subbituminous coal and lignite are in North Dakota, Montana, Wyoming, Washington, Alaska, and New Mexico.

Labor Relations

Following years of bitter strife, relations between coal management and the United Mine Workers (led by John L. Lewis until 1960) have been quite harmonious. No industry-wide strike has occurred since 1949, union leaders cooperate with management in settling wildcat and other local strikes, increasing productivity has been encouraged, and wage increases were passed up in several new contracts because of the industry's problems. Actually, non-union coal miners are now a major concern of the large commercial coal companies, since these mines (usually small and marginal operations) have grown to account for roughly a quarter of total output and contribute considerably to price weakness, particularly in the East and South.

The labor agreement signed in 1964 calls for payment of a double welfare and retirement fund royalty by major coal companies for any non-union coal marketed by them. The 1959 labor contract prohibited marketing of non-union coal, but little success was acheived as chronically unemployed miners are willing to accept low wages or work as independent contractors at non-union properties. These mines could not operate if they paid the union scale wage rates and the $0.40 a ton royalty charge (this payment is larger than most companies' profit per ton and has led to omission or reduction in fund payments by some union mines under so-called "sweet-heart" contracts).

A new contract was being sought by union leaders in early 1966, but no settlement had been reached at the date of this writing. Union demands indicated a greater emphasis on fringe benefits and a total package somewhat in excess of the $2 a day granted in the 1964 pact.

As over-all markets for soft coal contracted and companies stepped up mechanization to offset higher wages and thus maintain coal's competitive position, employment at the mines dropped drastically. Even with the resumption of the uptrend in output in recent years, employment figures have continued to decline. In 1964, the working force averaged 128,700 in soft coal, compared with a postwar peak (1948) of 442,000. In the anthracite region, employment in 1964 was down to about 13,000, or a decline of about 60% from that of 1955.

Anthracite

Markets

The nation's anthracite industry, concentrated in four mining fields in eastern Pennsylvania, has been in a marked downtrend during the postwar years because of the loss of its major market, space heating, to oil and natural gas. Entry into industrial markets on a profitable and large-scale basis has not been possible for anthracite producers since the characteristics and geological formation of hard coal have precluded mechanization to the extent achieved in bituminous, and the resultant lowering of production costs. Production in 1965 declined 10% to 15.4 million tons. The total was 26% of 1926 output, only 15% of the record 100 million tons of 1917, and was roughly the same as anthracite production in 1866.

The majority of anthracite output is still used for space heating purposes in its main marketing area north of the Potomac and Ohio rivers and east of the Mississippi. This is where anthracite has lost its position, now accounting for about 8.5% of total fuels consumed in these states as compared with 83% in 1929. Oil and natural gas increased their respective shares of this market to about 64% and 28%, compared with 8% and 5% in 1929. Further losses seem probable for anthracite.

Cheap transportation costs make anthracite an economic fuel for some electric utilities in Pennsylvania. In 1964, some 14% of total output was used by electric power stations. Part of the anthracite is obtained from dredging rivers (particularly the Susquehanna) where fine coal has accumulated as a result of dumping upstream by coal breakers. The dredged coal is quite cheap, as exemplified by the

Holtwood steam station of PENNSYLVANIA POWER & LIGHT, where dredged coal costs the company approximately $2.70 a ton. As a result, fuel costs of this station are less than half those of the average Pennsylvania plant and are among the lowest of any of the nation's major steam plants.

Utilities offer little hope for the commercial coal producers, however, since the fine sizes used in boilers are not profitable except as a by-product or co-product of the higher-priced large sizes. The same is true of other industrial markets for fine anthracite, except where it can be obtained at little cost, as in dredging or recovery from waste banks.

A small amount of anthracite is added to bituminous in some ovens in making coke. Increased usage of anthracite is expected in pelletizing taconite but this market again requires the fine and least profitable sizes. Exports of anthracite have become more important, reflecting shipments to U.S. military forces in Europe, but fluctuated widely in recent years. Foreign demand seems likely to continue to be irregular. Canada is still an important though declining market.

Production; Costs

Anthracite deposits generally are not level as are bituminous seams but run at angles which sometimes are over 60%. These pitched seams preclude utilization of continuous mining machines and other mechanical improvements that have contributed so greatly to the marked gains in productivity in soft coal mines. Average output per man day in the hard coal fields is about 6.1 tons, compared with more than 17 tons in bituminous mines. This compares with 3.79 tons at the end of World War II; much of the improvement stems from a higher portion of production from strip mines as well as closing of high-cost underground properties. Strip mines now account for about 42% of output, underground mines for 34%, waste banks for 20%, and river dredging for 4%.

Hourly wages at anthracite mines average about a half dollar less than at soft coal mines but the union welfare and retirement fund payment is $0.70 a ton, against $0.40. Non-union production of anthracite is sizable.

After mining, the hard coal is processed in breakers or washeries which remove foreign matter and size the coal. The large sizes ranging from 3 inch broken grades to 1⅝-inch chestnut generally sell for over $12 a ton at the mines. Pea and the larger buckwheat sizes are priced between $9 and $11 a ton, and the finest buckwheat sizes sell for less than $3 a ton.

With wage, pumping (at undeground mines), and material costs rising at a time when demand for the more profitable larger size coal is dropping, profits for fully unionized hard coal producers have become quite meager. No reversal of the present drab situation is seen.

Composite Industry Data

**Per Share Data in Terms of Standard & Poor's Stock Price Index*

Bituminous Coal Companies

The five companies used for this series of composite data are: Consolidation Coal Co., Island Creek Coal Co., North American Coal Co., Peabody Coal Co., and Pittston Co.

	1958	1959	1960	[1]1961	1962	1963	1964	1965
Sales	82.58	95.35	94.51	70.47	76.05	82.78	87.53	100.49
Operating Income	9.38	11.38	10.85	11.22	11.36	13.07	14.64	15.87
Profit Margin %	11.34	12.11	12.64	16.02	15.72	15.79	16.72	15.49
Depreciation	4.03	4.58	4.42	4.19	4.54	4.70	5.25	5.39
Taxes	1.45	1.79	1.79	2.03	2.26	2.41	2.75	2.82
Earnings	4.28	4.98	4.65	4.79	4.56	5.78	6.69	8.06
Dividends	2.80	2.87	2.99	2.50	2.70	2.94	3.22	3.00
Earnings as a % Sales	4.82	4.97	5.50	6.45	6.42	6.95	7.87	8.62
Dividends as a % of Earnings	65.42	62.53	64.30	53.19	53.57	50.87	46.86	44.67
Price (1941-43=10) —High	82.04	84.59	93.70	97.27	100.79	115.17	123.68	124.71
—Low	61.41	71.87	58.21	63.67	69.11	80.96	105.04	101.56
Price/Earnings Ratios —High	19.17	16.43	18.00	20.70	20.00	19.93	17.81	11.97
—Low	14.35	13.67	12.52	13.97	13.71	14.01	15.25	12.64
Dividend Yield % —High	4.56	3.99	5.14	3.51	3.91	2.62	2.08	3.57
—Low	3.41	3.39	3.57	3.57	2.68	3.55	2.43	2.80
Book Value	63.22	64.91	66.32	59.65	62.91	68.53	73.63	77.04
Return on Book Value %	6.77	7.67	7.01	7.88	7.89	8.43	9.43	10.46
†Working Capital	22.16	22.55	24.51	19.71	20.28	17.90	18.61	17.63
Capital Expenditures	8.43	7.26	4.31	5.32	5.74	10.55	8.62	9.37

*NOTE: All of the per share data herein are expressed in terms of the S & P Stock Price Index, i.e., stock prices, 1941-43=10. The yield is first obtained, this being the aggregate value of all dividend payments divided by the year-end aggregate market values on which the stock price indexes are based. This yield is then applied to the year-end stock price index, giving the indicated per share dividends in terms of the S & P Stock Price Index. Thus, a yield of 5% applied to a stock price index of seventy would indicate dividend of $3.50 "per share" on the index. All other items (totals) are then related to the total dividend payments. So, if total sales amount to fifteen times the total dividend payments, then, with "per share" dividends at $3.50 the indicated per share sales will be (15 x 3.50) $52.50 in terms of the S & P Stock Price Index. For comparability between the various groups, all data are on a calendar year basis, corporate data being posted in the year in which most months fall. Fiscal years ending June 30th are posted in the calendar year in which the fiscal year ends. †Current assets less current liabilities, without allowance for long-term debt. [1]Peabody Coal added; United Electric Coal dropped.

Comparative Company Analysis

Revenue Record

BITUMINOUS COAL—Mergers distort the sales records of major producers, but the Midwestern steam coal producers (PEABODY, UNITED ELECTRIC, and AYRSHIRE) have outstanding records. Current sales of other producers (mainly eastern) are below peaks attained during the Suez crisis, but a recent uptrend has been sparked by sharply higher demand in utility and export markets.

Sales (1957-59=100)

	[1]Composite Data		BITUMINOUS												
	425 Industrials	Coal—Bituminous	Ayrshire Coal	[2]Consol. Coal	Eastern G. & F.	[3]Island Creek	Manet Coal	North Amer.	Old Ben Coal	[4]Peabody Coal	Pittston Co.	Roch. & Pitts.	United Elec.	[5]Wstmrld.	Zeigler Coal	X Comp.
1965	---	102	122	103	111	81	---	77	104	204	123	83	137	[6]132.62	58	---
1964	121	88	122	96	101	82	110	78	97	185	110	79	141	[6]120.32	87	---
1963	123	94	125	92	89	N.A.	126	73	82	156	112	81	125	[6]22.90	81	---
1962	116	77	120	87	99	84	101	77	79	120	105	75	120	---	87	---
1961	107	71	103	86	87	94	80	73	76	117	97	80	114	---	91	---
1960	101	85	103	91	92	91	70	84	81	128	99	85	103	---	94	---
1959	104	97	100	91	97	100	51	101	93	107	94	89	95	---	96	---
1958	94	90	95	91	93	---	106	115	98	91	87	97	97	---	88	---
1957	100	117	101	118	112	---	113	[7]89	106	102	114	114	103	---	107	---
1956	96	96	96	103	104	---	128	120	116	85	103	114	94	---	113	---
1955	87	88	87	84	89	---	---	105	100	80	84	93	79	---	111	---
	Average Net Sales In 1957-59 Base Period, in Millions of Dollars; Months Indicate when fiscal year ends.															
			45.2	210.0	139.4	[8]154.47	20.2	31.9	27.2	122.2	276.5	42.6	13.9		19.9	---
			June	Dec.	Dec.	Dec.	[9]Mar.	[9]Dec.	Dec.	Dec.	Dec.	Dec.	[10]Dec.	---	Dec.	---

[1]Based on Standard & Poor's Industry Group Stock Price Indexes.

[2]Of following calendar year. [3]Years ended Apr. 30 of foll. calendar year prior to 1957; 1958-60=100. [4]Eight mos. [5]Includes Pocahontas Fuel Co. after 1953 and Traux-Traer Coal after 1960. [6]Incl. opers. of Sinclair Coa. after 1954. [7]1958=100. [8]Represent pro-forma comb. accts. of Island Creek Coal & Kentucky Coal in 1963 and pr. yrs. [9]Comb. accts. of Westmoreland Coal Co. and Stonega Coke & Coal Co. [10]In millions of dollars; other years not comparable. [11]Yr. end. July 31 prior to 1965. N.A.—Not Available.

Profit Margins

BITUMINOUS COAL — PEABODY and UNITED ELECTRIC COAL have the widest profit margins in the industry, reflecting operations of low-cost strip mines and the firm price structure for utility steam coal in midwestern markets (heavy development and other non-recurring costs were responsible for the 1965 decline in the latter's spreads). Mechanization and other cost reduction moves by most eastern producers have countered increases in labor costs and some price weakness, with CONSOLIDATION'S performance providing a notable example. Both PITTSTON and EASTERN GAS & FUEL have attractive records, the lower margins of the former reflecting the smaller return on sales of its non-coal operations.

Profit Margins (%)

*Operating Income as a Percentage of Revenues

	[1]Composite Data		BITUMINOUS												
	425 Industrials	Coal—Bituminous	Ayrshire Coal	Consol. Coal	Eastern G. & F.	[2]Island Creek	Manet Coal	North Amer.	Old Ben Coal	[3]Peabody Coal	Pittston Co.	Roch. & Pitts.	United Elec.	[4]Wstmrld.	Zeigler Coal	X Comp.
1965	---	13.5	11.6	14.3	17.1	11.3	---	12.9	16.9	28.4	10.4	2.8	29.4	15.4	9.9	---
1964	13.9	14.7	11.8	16.0	16.5	12.1	13.5	15.4	20.4	27.5	10.1	3.2	34.9	17.1	11.2	---
1963	13.7	13.8	10.7	17.1	14.0	N.A.	16.6	16.4	21.6	26.8	9.0	5.5	31.8	14.7	8.2	---
1962	13.2	13.7	10.2	16.6	12.9	10.7	13.6	13.1	21.5	27.0	10.3	[5]7.8	33.5	---	10.4	---
1961	11.7	14.0	11.5	17.0	12.2	11.0	14.2	14.4	20.1	27.4	10.3	---	30.2	---	11.6	---
1960	14.7	12.6	12.3	14.7	10.4	9.8	10.4	12.2	11.7	25.5	10.1	def.	25.9	---	12.7	---
1959	13.2	13.1	13.3	14.3	7.7	9.6	7.5	8.0	8.8	25.9	8.8	1.9	25.6	---	9.6	---
1958	14.4	11.3	12.9	13.3	7.9	---	8.2	10.3	8.5	13.8	8.6	5.4	23.8	---	8.6	---
1957	15.8	13.0	11.8	14.2	12.3	---	4.9	[6]11.3	8.7	15.2	7.1	8.1	27.8	---	9.9	---
1956	15.3	13.3	14.1	13.7	11.4	---	8.8	10.9	8.5	13.3	6.8	9.9	24.9	---	8.4	---
1955	15.9	14.1	12.8	15.3	8.0	---	---	11.1	8.3	17.8	8.4	7.3	18.4	---	8.9	---

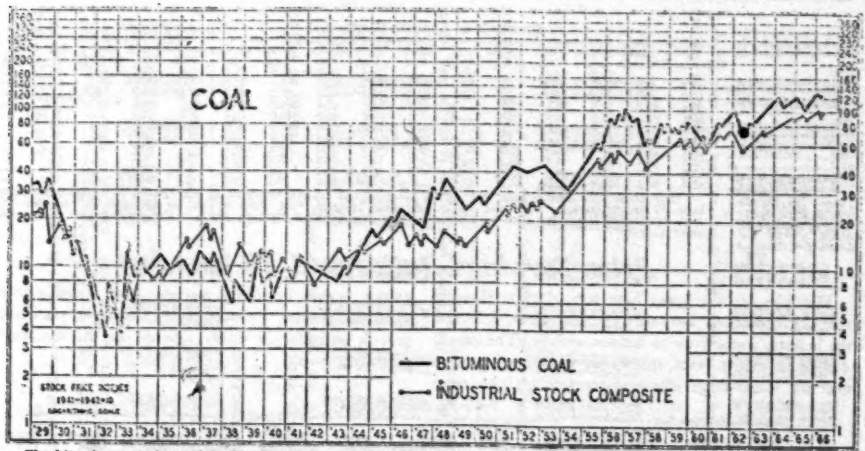
[1]Based on Standard & Poor's Industry Group Stock Price Indexes.

[2]Based on consolidated revenues. [3]Based on combined pro-forma figures in 1955 and prior years. [4]8 mos. [5]Reclassified. [6]Based on combined data. *Operating Income is usually the balance left from revenues after deducting operating costs, selling general, and administrative expenses, local and state taxes; provision for bad debts and pensions; but before other income and before deducting depreciation charges, debt service charges, if any, Federal taxes, and any special reserves. N.A. Not available.

Net Income Ratios

BITUMINOUS COAL—PITTSTON has an above average long-term record of profits growth, reflecting increased trucking, and oil distribution profits through internal expansion and acquisitions, and more recently, the marked improvement in coal profits. Returns of the two largest producers, PEABODY and CONSOLIDATION, have shown the greatest gains, reflecting the superior financial and reserve positions of both.

The 1963 drop in net of EASTERN GAS & FUEL reflects the exchange of its investment in Norfolk & Western R.R. for a nearly commensurate portion of its equity. The UNITED ELECTRIC decline in 1965 was due largely to the non-recurring factors that adversely affected its profit margins.



The bituminous stocks used in Standard & Poor's price index are: Consolidation Coal, Island Creek Coal, North American Coal, Peabody Coal Co., and Pittston Co.

Net Income (1957-59=100)

	‡Composite Data		BITUMINOUS													
	425 Industrials	Coal—Bituminous	Arkansas Coal	Consol. Coal	Eastern G. & F.	*Island Creek	Mount Coal	North Amer.	Old Ben Coal	Peabody Coal	Pittston Co.	Roch. & Pitts.	United Elec.	Westmoreland	Zeigler Coal	U. Corp.
1963	---	154	121	188	127	169	---	120	250	220	154	def.	197	*53.21	162	---
1962	148	191	134	152	105	167	286	*171	215	205	131	def.	279	*52.09	160	---
1961	128	110	102	131	74	153	278	*156	155	168	117	41	126	*51.30	174	---
1960	115	96	95	111	102	93	254	96	172	174	128	82	197	---	132	---
1959	101	90	90	104	95	104	184	132	161	122	118	160	146	---	157	---
1958	102	89	111	87	95	109	105	114	91	122	104	def.	203	---	255	---
1957	104	88	105	94	89	100	93	99	85	111	98	def.	101	---	122	---
1956	99	85	94	94	84	---	170	116	81	95	91	7	86	---	117	---
1955	106	131	101	122	157	---	98	*140	122	94	130	122	113	---	149	---
1954	105	109	80	100	126	---	153	107	141	83	110	574	93	---	128	---
1953	108	92	52	64	60	---	---	161	109	65	88	def.	35	---	63	---
	Avg. Net Income in 1957-59 Base Period, in Mills. of $; Mos. indicate when fiscal yr. ends.															
	2.18 June	$1.59 Dec.	8.53 Dec.	‡3.17 Dec.	0.76 Dec.	0.91 ²Mar.	1.34 ²Dec.	10.94 Dec.	6.77 Dec.	0.23 Dec.	1.53 Dec.	0.98 ³Dec.	0.62 ¹²Dec.	0.62 Dec.	Dec.	---

‡Based on Standard & Poor's Industry Group Stock Price Indexes.

¹Of foll. calendar year; ²Years ended Apr. 30 of foll. calendar year prior to 1957; 1957-59=100. ³Eight mos. *1956-58=100. ⁴Based on combined data. ⁵1956=100. ⁶Before spec. credit. ⁷In millions of dollars; other years not comparable. ⁸July 31 prior to 1955. def.—Deficit.

DEFINITION—Net Income is simply the net profit after all charges as reported by the company.

Net Income As a Percentage of Revenues (%)

	‡Composite Data		BITUMINOUS													
	425 Industrials	Coal—Bituminous	Arkansas Coal	Consol. Coal	Eastern G. & F.	*Island Creek	Mount Coal	North Amer.	Old Ben Coal	Peabody Coal	Pittston Co.	Roch. & Pitts.	United Elec.	Westmoreland	Zeigler Coal	U. Corp.
1963	---	8.0	6.4	13.0	5.8	8.5	---	4.2	10.4	10.8	8.6	def.	11.3	8.4	5.8	---
1962	8.6	7.9	6.8	11.2	5.2	4.7	5.8	8.1	10.7	11.3	8.5	def.	14.4	6.9	5.8	---
1961	8.2	7.0	5.8	10.0	4.2	N.A.	7.0	*7.4	9.8	10.8	8.0	0.4	11.4	5.7	4.3	---
1960	8.8	6.6	5.5	8.0	5.7	2.7	6.3	5.4	9.5	11.0	8.5	0.8	12.8	---	4.8	---
1959	8.7	6.7	7.6	8.6	5.7	3.9	5.6	8.5	9.1	11.5	8.5	7.5	14.5	---	6.5	---
1958	8.7	6.5	7.6	7.4	5.2	3.8	3.8	8.7	4.9	10.3	8.3	def.	21.6	---	6.7	---
1957	8.0	8.0	7.4	7.8	8.3	3.4	3.5	7.9	4.6	10.4	9.9	def.	11.5	---	4.0	---
1956	8.5	4.8	6.7	6.6	4.5	---	3.9	7.8	4.0	8.9	8.3	0.5	10.0	---	3.8	---
1955	8.3	8.9	7.0	7.2	7.1	---	6.9	*8.3	8.0	8.2	8.3	2.0	12.8	---	5.7	---
1954	8.4	8.7	6.5	8.6	6.1	---	3.9	8.4	9.3	8.6	8.0	3.6	11.1	---	3.9	---
1953	8.6	7.4	5.4	8.3	3.4	---	---	8.1	4.7	*8.1	1.9	def.	5.4	---	1.8	---

‡Based on Standard & Poor's Industry Group Stock Price Indexes.

*Based on consolidated revenues. ²Based on pro-forma figures in 1955. ³8 mos. ⁴Based on combined data. ⁵After spec. chgs. ⁶Not comparable in this and prior years.

DEFINITION—Net Income is simply the net profit after all charges as reported by the company.

Dividend Policies

Coal producers as a group have followed fairly conservative policies, although maintenance of payments in periods of cyclically reduced earnings resulted in high payouts in some years. Capital needs for expanding capacity have limited the payouts of some companies. EASTERN GAS & FUEL eliminated cash payments in 1963, but has followed a policy of steadily reducing its number of shares outstanding through purchases.

Dividends on Common Stocks (%)

	†Composite Data			BITUMINOUS											
	425 Industrials	Coal—Bituminous	Anthracite Coal	Consol. Coal	Eastern G. & F.	Island Creek	Kanawha Coal	North Amer.	Old Ben Coal	Peabody Coal	Pittston Co.	Rech. & Pitts.	United Elec.	Westmoreland	Zeigler Coal	X Corp.
1965	----	----	20.5	4.4	‡----	55.8	----	70.4	65.3	41.5	41.3	Nil	49.2	43.9	44.7	----
1964	53.2	46.9	20.1	53.3	‡----	63.0	80.5	69.3	48.5	36.1	39.9	Nil	37.5	40.7	47.2	----
1963	52.7	50.8	21.3	55.6	‡----	63.6	81.4	74.0	43.5	29.5	39.0	35.6	33.3	14.5	46.2	----
1962	57.4	52.6	24.2	68.0	67.5	‡----	43.8	52.6	43.3	26.2	29.2	66.7	45.8	‡‡----	56.8	----
1961	61.4	53.2	27.5	61.8	73.7	‡----	Nil	29.8	44.3	23.6	25.6	Nil	41.0	----	37.5	----
1960	58.8	54.3	31.5	66.7	75.8	‡----	Nil	49.6	54.5	31.7	25.8	Nil	48.6	----	45.7	----
1959	56.9	52.5	31.6	58.3	‡----	Nil	‡	----	55.8	36.4	28.4	Nil	59.5	----	52.6	----
1958	56.2	51.9	34.5	50.9	35.8	49.6	Nil	45.6	44.6	‡	19.0	8.5	40.8	----	39.3	----
1957	53.0	49.4	33.0	41.4	34.5	48.9	Nil	43.7	50.3	Nil	14.8	29.8	38.1	----	35.2	----
1956	52.6	51.9	34.5	50.9	35.8	49.6	Nil	45.6	44.6	‡	19.0	8.5	40.8	----	39.3	----
1955	48.6	52.1	36.2	48.5	44.9	*47.3	----	43.0	43.6	Nil	17.4	Nil	50.0	----	54.5	----

†Based on Standard & Poor's Industry Group Stock Price Indexes. E-Estimated

‡Dividends paid despite loss. ‡‡Dividends exceeded net profits. ‡Paid 2% in stk. in 1963 and 3% in 1964 and 1965. ‡Paid 2.5% in stk. in 1963. ‡Plus 5% in stk.; also paid 3% in stk. Jan. 31, 1962. ‡Pd. 2.5% in stk. in 1963 and 3% in 1964 and 1965. ‡Plus 3% in stk.; also paid 3% in stk. Jan. 31, 1962. ‡Pd. 2.5% in stk. in 1963 and 3% in 1964 and 1965. ‡Excludes Kentucky Coal in 1963 and prior years. ‡Plus 3½% in stock. ‡Not comparable in this and prior years. ‡Based on consolidated earnings. ‡Plus 5% in stk.; also paid 3% in stk. Jan. 31, 1962. ‡Pd. 2.5% in stk. in 1963 and 3% in 1964 and 1965. ‡Excludes Kentucky Coal in 1963 and prior years. ‡Plus 3½% in stock. ‡Not comparable in this and prior years.

Price-Earnings Ratios and Yields

Multiples for the group have been close to those of the 425 Industrials composite in most years, reflecting the industry's sensitivity to business activity. The overall decline in recent years appears to stem from concern over the longer-range effects of competition from other energy sources in utility markets. The above average valuation granted PEABODY stems from the significant growth potential in utility demand in the company's marketing area.

Price-Earnings Ratios

	†Composite Data			Coal—Bitum.	BITUMINOUS																			
	425 Industrials		Coal Bituminous	P/E as % of Ind. P/E's	Anthracite Collieries		Consol. Coal		Eastern Gas & Fuel		Island Creek		Kanawha Coal & Coke		Kaiser Coal		North Amer.		Old Ben Coal		Peabody Coal		Pittston Co.	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
1965	----	----	16.0	15.6	----	----	11.7	8.5	14.0	11.3	14.4	10.7	16.7	10.5	----	----	22.3	16.0	18.5	14.1	20.3	14.3	12.4	9.6
1964	18.5	16.4	17.8	15.2	97.4	85.5	11.3	8.6	15.7	14.5	13.9	11.1	16.5	12.6	22.1	17.3	11.5	8.0	14.9	12.4	21.8	17.1	12.1	10.2
1963	18.7	15.4	18.9	14.0	108.6	90.7	11.8	9.9	20.3	13.9	24.5	14.7	18.3	11.0	11.9	7.8	28.8	19.4	15.9	12.4	25.6	17.0	13.8	12.8
1962	19.6	14.2	20.0	13.7	101.8	85.8	14.6	8.3	19.5	13.0	21.4	12.4	31.7	18.5	11.7	7.1	28.5	21.9	14.2	8.6	23.7	14.9	15.9	11.1
1961	22.3	18.1	23.7	14.9	90.9	77.4	15.8	11.3	20.9	13.6	26.1	13.6	22.6	15.1	----	----	27.5	21.9	14.2	8.6	23.7	14.9	15.9	11.1
1960	19.1	14.2	18.0	12.5	84.1	74.9	10.5	9.7	16.2	13.4	14.6	11.6	24.2	14.5	----	----	17.5	11.9	15.9	11.4	16.4	11.9	17.7	9.9
1959	20.1	16.2	18.0	12.5	84.1	74.9	10.5	9.7	16.2	13.4	14.6	11.6	24.2	14.5	----	----	21.5	20.2	16.2	11.5	15.9	10.0	17.8	13.7
1958	18.8	14.4	18.4	12.7	97.5	85.4	11.6	7.2	19.3	14.3	26.8	18.4	29.8	21.9	----	----	18.6	13.5	18.0	7.6	18.5	7.4	24.1	12.3
1957	20.0	14.6	19.2	14.4	95.9	88.0	8.7	6.0	20.5	15.0	14.3	10.2	20.7	14.0	----	----	18.6	13.5	18.0	7.6	18.5	7.4	24.1	12.3
1956	15.1	11.9	14.3	8.8	93.8	72.8	8.8	5.8	16.0	10.0	9.6	8.5	12.7	8.6	----	----	21.5	11.7	11.9	8.7	21.5	8.7	11.7	9.3
1955	13.8	10.4	11.5	8.3	91.8	79.3	8.5	6.2	10.5	8.9	9.5	7.5	11.3	8.3	----	----	14.7	9.0	10.6	6.5	14.7	8.8	11.4	8.3
1954	12.3	10.1	11.3	11.3	112.0	89.3	11.3	8.7	11.1	9.6	10.5	4.9	14.1	8.3	----	----	----	----	7.8	6.0	14.8	8.9	12.5	7.7
1953	17.5	9.9	14.5	9.9	104.8	93.3	12.3	7.2	12.5	10.5	10.3	6.3	11.3	6.3	----	----	----	----	----	----	----	----	----	----

†Based on Standard & Poor's Industry Group Stock Price Indexes.

	BITUMINOUS											
	Rech. & Pitts.		United Elec.		Westmoreland		Zeigler		X Corp.	
	High	Low	High	Low	High	Low	High	Low	High	Low
1965	def.	def.	13.9	11.5	12.0	8.0	28.7	11.9	----	----
1964	def.	def.	11.5	9.2	9.2	6.9	12.2	8.5	----	----
1963	‡	‡	17.5	15.4	18.7	8.5	18.7	12.7	----	----
1962	40.0	33.3	17.6	11.4	----	‡----	16.3	9.9	----	----
1961	10.8	9.2	17.3	11.4	----	----	13.5	7.7	----	----
1960	def.	def.	16.7	11.3	----	----	9.4	4.2	----	----
1959	def.	def.	14.0	10.9	----	----	8.0	7.1	----	----
1958	def.	def.	15.1	14.8	----	----	9.4	4.3	----	----
1957	12.9	7.4	11.8	7.3	----	----	22.4	7.9	----	----
1956	6.9	2.2	14.8	8.6	----	----	10.0	4.5	----	----
1955	def.	def.	13.7	12.4	----	----	7.1	5.6	----	----

‡Ratio over 50 not calculated. ‡Excludes Kentucky Coal in 1963 and prior years. ‡Data not comparable in this and prior years.
DEFINITION: High and low calendar year market prices divided by net per common share.

Yields (%)

	†Composite Data			Coal—Bitum.	BITUMINOUS																			
	425 Industrials		Coal Bituminous	Yields as % of Ind. Yields	Anthracite Collieries		Consol. Coal		Eastern Gas & Fuel		Island Creek		Kanawha Coal & Coke		Kaiser Coal		North Amer.		Old Ben Coal		Peabody Coal		Pitt-ston Co	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
1965	----	----	3.5	3.4	----	----	2.4	1.7	4.0	2.2	‡----	‡----	5.3	3.3	6.2	4.2	4.4	3.0	3.5	2.4	2.9	2.1	4.3	3.1
1964	3.2	2.8	3.1	2.6	56.9	50.0	2.4	1.8	3.7	3.0	‡----	‡----	5.0	3.8	4.4	3.4	3.8	2.7	3.7	2.9	5.1	3.9	4.1	3.4
1963	3.6	3.0	3.6	2.6	100.8	88.4	2.5	2.1	4.6	3.2	‡----	‡----	4.6	2.8	3.0	2.0	7.2	4.9	4.0	3.1	6.4	4.3	3.5	3.2
1962	4.0	2.9	4.1	2.7	97.5	91.5	3.3	1.9	4.4	3.0	‡‡	‡‡	8.6	5.0	3.2	2.4	7.8	5.9	4.3	2.6	7.1	4.5	4.8	3.4
1961	3.4	2.6	3.5	2.4	112.1	95.2	3.4	1.7	4.7	3.1	5.4	2.8	6.9	4.5	Nil	Nil	8.9	6.8	5.3	3.1	8.8	5.4	5.8	4.1
1960	3.6	2.7	3.5	2.5	142.4	115.9	3.3	2.0	5.2	3.5	6.5	5.2	8.3	4.8	Nil	Nil	7.5	5.1	4.8	3.4	7.5	5.3	5.2	3.6
1959	3.4	2.8	4.0	2.4	116.7	113.4	3.0	2.0	5.3	3.8	6.3	4.7	6.1	4.7	Nil	Nil	6.2	4.5	4.5	3.2	6.9	4.3	5.3	3.9
1958	4.3	3.2	4.8	2.4	108.8	108.8	3.5	2.6	6.7	4.9	8.1	5.5	6.5	Nil	Nil	Nil	6.0	4.4	7.3	4.9	8.3	5.3	5.0	3.5
1957	4.6	3.4	4.6	2.9	99.4	78.3	3.6	2.1	6.1	3.8	6.9	3.3	7.1	3.7	Nil	Nil	5.7	3.1	5.8	4.3	Nil	Nil	3.7	3.4
1956	4.6	3.4	4.4	2.9	100.3	83.8	3.8	2.2	5.7	3.4	9.0	3.7	6.0	3.5	Nil	Nil	5.0	3.1	6.8	4.2	‡----	‡----	3.2	2.7
1955	4.9	3.5	5.3	3.6	108.0	102.6	5.0	3.8	6.4	5.0	7.1	6.4	7.5	4.3	----	----	----	----	7.1	5.6	Nil	Nil	4.1	3.5

†Based on Standard & Poor's Industry Group Stock Price Indexes.

	BITUMINOUS											
	Rech. & Pitts.		United Elec.		Westmoreland		Zeigler		X Corp.	
	High	Low	High	Low	High	Low	High	Low	High	Low
1965	Nil	Nil	4.3	3.5	3.5	2.7	3.9	1.6	----	----
1964	Nil	Nil	4.0	3.3	3.5	4.1	5.6	3.8	----	----
1963	9.9	9.7	4.0	----	4.1	1.2	5.7	3.0	----	----
1962	2.9	2.7	4.0	2.6	‡----	‡----	5.7	3.5	----	----
1961	Nil	Nil	3.8	2.6	----	----	5.7	2.8	----	----
1960	Nil	Nil	3.2	2.5	----	----	6.1	4.8	----	----
1959	Nil	Nil	3.4	4.3	----	----	4.6	3.3	----	----
1958	8.0	2.7	7.1	4.6	----	----	3.8	2.7	----	----
1957	4.0	2.3	5.2	3.2	----	----	10.7	3.6	----	----
1956	2.6	1.2	4.8	2.8	----	----	4.5	2.9	----	----
1955	Nil	Nil	4.3	4.5	----	----	6.5	4.4	----	----

‡Paid 2% in stock. ‡Pd. 2.2% in stk. in 1963 and 2% in 1964 and 1965. ‡Excludes Kentucky Coal in 1963 and prior years. ‡Data not comparable in this and prior years.
DEFINITION: Fiscal year dividends paid, divided by calendar year price ranges of common stocks.

AYRSHIRE COLLIERIES — YEARS TO JUNE 30

Funded Debt: $32,862,502; Com., 790,145 Shs., $2 Par.

	Revenues	*Oper. Inc.	Net Bef. Taxes	Net Income	Common $ Per Share Earns.	Div.	Price Range (Calendar Yrs.)	Book Value	Net Wtg. Cap. (Mil. $)	Curr. Ratio Assets To Liabs.
	—Millions—									
1965...	60.15	7.00	5.13	2.85	4.58	1.00	54 - 46	58.84	17.13	2.5-1
1964...	58.0	7.03	5.79	2.93	4.67	1.00	57 - 41½	54.26	8.94	1.4-1
1963...	54.5	6.06	4.67	2.35	4.11	1.00	45½- 40½	50.41	6.54	1.5-1
1962...	54.3	5.56	4.70	2.01	3.61	1.00	55⅝- 31⅝	46.31	7.50	1.7-1
1961...	48.1	5.01	4.50	2.03	3.62	0.95	67 - 40⅞	43.31	6.34	1.9-1
1960...	46.4	4.71	4.32	2.03	4.46	0.86	46⅝- 34½	45.70	6.47	2.1-1
1959...	43.3	4.02	3.68	1.54	4.22	0.81	46⅝- 30⅛	42.89	6.67	2.1-1
1958...	44.5	3.74	4.09	3.00	3.79	0.87	33 - 24	38.78	8.97	2.1-1
1957...	48.8	5.43	4.73	3.21	4.06	0.83	33½- 23⅞	36.89	11.07	2.4-1
1956...	38.9	3.49	2.95	2.18	2.79	0.79	30⅛- 21½	32.41	6.81	2.0-1

Per shr. figs. adj. for stk. divs. of 5% each in 1956-60 & 2% each in 1961 & 1962.

CONSOLIDATION COAL CO. — YEARS TO DEC. 31

Funded Debt: $10,700,531; Com., 9,598,313 Shs., $1 Par.

1965...	316.05	57.74	51.75	41.17	4.16	1.88	66⅝- 46⅞	38.79	72.58	2.6-1
1964...	297.56	53.49	44.86	33.78	3.47	1.75	52⅝- 37⅞	34.59	103.57	3.5-1
1963...	268.10	48.63	41.52	32.77	3.31	1.60	42⅝- 32⅝	32.43	106.48	4.1-1
1962...	258.40	44.78	39.36	34.38	3.36	1.55	40⅝- 30¼	34.71	123.04	4.4-1
1961...	248.05	43.69	39.88	33.63	3.16	1.40	42⅜- 29⅝	32.37	120.63	4.3-1
1960...	257.99	37.94	32.64	18.06	2.10	1.40	40⅜- 27	34.24	114.27	4.1-1
1959...	262.03	40.51	36.77	25.33	2.53	1.40	42⅜- 27	33.67	106.36	4.0-1
1958...	252.23	37.63	33.23	18.47	1.90	1.30	41 - 30	32.54	96.78	4.2-1
1957...	265.63	51.23	37.37	30.67	2.90	1.30	44⅛- 29½	31.86	93.05	4.0-1
1956...	235.59	42.76	31.37	21.97	2.39	1.30	50⅛- 31½	30.54	100.60	4.3-1

[illegible] Trans-Tracer Coal aft. 1960. Note—Earnings per shr. are after profit of $0.09 in 1956 and $0.04 in 1957; aft. a tax cr. of $0.10 in 1958; excl. crs. of $0.39 in 1961, $0.56 in 1962, $0.04 in 1963, $0.05 in 1964, & $0.54 in 1965.

EASTERN GAS & FUEL ASSOCIATES — YEARS TO DEC. 31

Funded Debt: $163,287,000; Com., 1,356,974 Shs., $10 Par.

1965...	187.76	22.09	15.34	10.87	*6.07	⁴ ----	116 - 86¼	62.55	16.18	1.5-1
1964...	170.34	20.13	13.02	8.94	*5.84	⁴ ----	92⅝- 64⅝	48.14	8.62	1.3-1
1963...	151.10	21.17	9.81	6.34	*3.15	⁴ ----	77 - 46¾	47.26	12.90	1.4-1
1962...	151.94	19.59	12.05	8.63	*2.37	1.60	65⅝- 31½	42.46	17.45	1.7-1
1961...	147.62	17.93	10.88	8.24	2.17	1.60	44⅞- 29⅝	39.08	13.46	1.8-1
1960...	155.29	16.16	9.71	8.07	2.11	1.60	36⅜- 24½	38.04	20.54	2.4-1
1959...	137.6	12.16	6.11	4.92	1.88	1.60	34⅛- 25⅝	29.88	21.88	2.6-1
1958...	161.3	13.72	6.92	7.20	*2.17	1.60	30⅜- 22⅝	31.48	23.73	2.6-1
1957...	149.2	22.06	14.15	13.41	4.01	*1.40	37⅝- 22¾	33.23	26.63	3.0-1
1956...	176.9	20.19	13.35	10.71	3.61	*1.40	37⅝- 27½	32.53	25.84	2.9-1

*Plus 5% in stk. in 1956 and 4% in 1957. ²Incl. non-recur. gain of $0.50 sh. in 1958; bef. spec. chg. of $0.90 in 1962. ³Paid 2.5% stk. ⁴Paid 3% stk. ⁵Based on avg. [illegible]

⁵ISLAND CREEK COAL CO. (DELAWARE) — YEARS TO DEC. 31

Debt: $1,500,000; Com., 2,254,842 Shs., $0.50 Par.

1965...	109.55	12.41	6.84	*6.02	*2.70	1.60	45 - 36¼	35.02	27.61	3.2-1
1964...	113.62	13.51	6.71	*5.51	*2.58	1.60	39¼- 30	34.48	23.60	2.4-1
1963...	----	----	----	4.19	----	----	----------	----	----	----
1962...	117.84	11.66	----	5.04	----	----	----------	----	----	----
1961...	113.91	12.42	----	5.66	----	----	----------	----	----	----
1960...	121.54	11.54	----	5.47	----	----	----------	----	----	----
1959...	124.47	12.56	----	5.17	----	----	----------	----	----	----

[illegible] Consol. in 1963 & $0.54 in 1962. *Paid 3% in 1964 & 4% yrs. [illegible]

MAUST COAL & COKE — ⁵YEARS TO MARCH 31

Funded Debt: $26,034,807; Common, 1,009,930 Shs., $1 Par; Cl. B, 936,176 Shs., $1 Par.

	Revenues	*Oper. Inc.	Net Bef. Taxes	Net Income	Common $ Per Share Earns.	Div.	Price Range (Calendar Yrs.)	Book Value	Net Wtg. Cap. (Mil. $)	Curr. Ratio Assets To Liabs.
	—Millions—									
1965...	----	----	----	----	----	1.00	23⅝- 16¼	----	----	----
1964...	33.21	7.49	3.44	1.91	1.01	0.85	23⅝- 16½	6.41	5.71	1.4-1
1963...	38.14	6.11	3.00	2.76	1.37	0.65	18⅝- 13⅞	7.19	3.43	1.7-1
1962...	30.40	4.14	2.07	1.58	1.07	0.45⅝	15⅛- 7⅝	6.11	0.83	1.5-1
1961...	24.14	2.46	1.72	1.35	0.78	Nil	----------	5.19	0.83	1.3-1
1960...	21.38	2.23	1.55	1.55	0.80	Nil	----------	3.61	0.43	1.3-1
1959...	24.50	1.80	0.63	0.61	0.44	Nil	----------	---	---	---
1958...	21.91	2.03	1.76	1.36	0.90	Nil	----------	---	---	---
1957...	24.11	1.50	0.35	0.34	0.25	Nil	----------	---	---	---
1956...	23.61	2.25	1.13	1.13	0.81	Nil	----------	---	---	---

⁵Of the following calendar year.

NORTH AMERICAN COAL CORP. — ⁵YEARS TO DEC 31

Funded Debt: 5,431,500; Com., 1,597,491 Shs., $1 Par.

1965...	26.56	3.43	1.65	1.13	0.71	0.50	16½- 11⅝	14.41	6.51	3.0-1
1964...	30.76	4.11	2.18	1.61	1.01	0.40	15⅝- 11	14.05	7.55	3.5-1
1963...	25.94	4.22	1.95	1.47	0.92	0.30	11⅞- 7⅝	13.15	7.51	4.4-1
1962...	24.29	3.63	0.93	0.93	0.67	0.30	10 - 6⅝	13.02	6.51	2.6-1
1961...	24.39	3.61	1.77	1.77	0.78	0.05	8⅝- 5¾	12.09	6.38	3.1-1
1960...	28.53	4.24	1.53	1.07	0.67	0.60	11⅝- 8	12.83	10.58	3.7-1
1959...	26.64	3.78	0.93	0.66	0.43	0.60	12⅝- 9¾	12.08	9.62	3.7-1
1958...	20.43	4.03	1.44	1.02	0.74	0.60	13¾- 10	12.22	10.03	4.1-1
1957...	20.38	3.43	1.45	1.09	0.80	0.60	13¾- 10¼	12.25	10.05	3.5-1
1956...	44.65	4.85	2.84	2.50	2.33	0.60	19⅛- 13	15.59	7.63	2.6-1

⁵Fiscal year ended Jan. 31 of the following calendar year in 1956. ⁶9 Mos. ended Dec. 31. *Bef. spec. crs. of $0.52 a shr. in 1963, $0.25 in 1964 & $0.15 in 1965.

OLD KEN COAL CORP. — YEARS TO DEC. 31

Long Term Debt: $7,000,000; Com., 1,031,870 Shs., $5 Par.

1965...	37.37	5.18	3.20	2.85	2.76	1.25	51 - 39	25.78	8.30	3.0-1
1964...	33.00	4.70	3.29	2.45	2.49	1.25	46 - 33½	23.20	10.80	3.0-1
1963...	31.55	4.66	2.90	2.11	2.30	1.00	36½- 28⅛	21.07	10.16	4.1-1
1962...	30.70	4.65	2.83	1.98	2.09	0.90	30⅝- 21½	20.53	9.84	3.8-1
1961...	29.05	4.03	2.54	1.93	1.93	0.85	27¼- 19⅝	20.58	8.32	4.0-1
1960...	27.38	3.49	2.17	1.64	1.70	0.60	21⅝- 15¾	20.07	7.14	4.8-1
1959...	24.31	3.16	2.03	1.67	1.68	0.60	16⅜- 11⅝	18.74	7.03	4.0-1
1958...	25.73	3.20	1.10	1.04	1.08	0.60	14⅝- 9¾	18.33	8.55	4.4-1
1957...	28.53	3.48	1.67	1.45	1.48	0.52	17⅝- 9¾	18.31	7.47	4.4-1
1956...	30.41	3.89	2.16	1.41	1.58	0.76	17¾- 11	17.44	7.42	3.9-1

PEABODY COAL CO. — YEARS TO DEC. 31

Funded Debt: $94,742,504; Pfd. 188,071 Shs., $1.25 Cum., $25 Par; Com., 9,797,337 Shs., $5 Par.

1965...	266.30	55.51	31.96	22.59	2.27	0.95	46 - 33⅛	16.07	33.80	2.0-1
1964...	228.62	52.39	30.11	21.61	2.19	0.95¼	39⅝- 27⅝	14.81	31.29	1.9-1
1963...	199.38	43.23	24.41	17.61	1.78	0.81⅝	34⅛- 27⅜	13.43	31.07	1.9-1
1962...	183.71	35.96	21.36	14.75	1.49	0.74	30 - 21⅝	12.27	27.99	1.8-1
1961...	170.59	33.58	19.22	13.61	1.37	0.62	25⅝- 19⅝	11.49	26.98	1.9-1
1960...	158.73	32.01	18.25	13.27	1.34	0.60	23⅜- 17⅝	10.80	25.72	1.9-1
1959...	150.77	28.33	16.27	11.54	1.16	0.60	19⅝- 14⅝	10.03	23.97	1.9-1
1958...	133.19	24.34	14.31	9.89	1.01	0.60	15⅝- 11⅝	9.31	22.60	1.9-1
1957...	141.65	30.19	15.94	9.92	1.07	Nil	17⅛- 11¾	8.95	19.85	1.7-1
1956...	97.50	21.10	11.80	8.41	1.01	⁴----	14⅞- 9⅝	8.77	17.70	1.7-1

⁴Pd. 5% in stk.

STATISTICAL DATA

PITTSTON CO. — YEARS TO DEC. 31

Funded Debt: $87,462,000; Com., 4,387,112 Shs., $0.50 Par.

	Revenues	*Quar. Div.	Net Inf. Years	Net Income	Common $ Per Share Price Range (Calendar Yrs.)			Net Wkg. Cap. (Mil. $)	Com. Value	Com. Div.	Curr. Ratio Assets To Liabs.
	($ Millions)				Earn.	Div.					
1950	56.2 91	20.00	11.54	10.42	2.41	0.95⅔	23⅞ - 13½	23.41	42.20	1.9-1	
1951	127.10	22.00	11.72	8.90	2.49	0.77	23½ - 14⅝	21.67	34.47	1.8-1	
1952	103.89	22.00	11.86	7.84	2.10	0.76	23½ - 14⅝	21.33	34.20	1.8-1	
1953	106.52	22.41	14.79	8.55	2.31	0.84	23½ - 16⅞	19.83	32.81	1.8-1	
1954	107.36	23.10	15.10	7.97	2.17	0.81	23½ - 16⅞	17.97	33.33	1.8-1	
1955	210.38	27.39	11.49	7.09	1.87	0.77	23½ - 16⅞	19.51	35.62	1.8-1	
1956	230.77	31.79	10.23	6.05	2.76	0.77	31⅞ - 19⅝	19.51	35.62	1.8-1	
1957	207.72	13.66	6.54	4.54	1.21	0.44	29⅛ - 14⅝	13.61	14.09	1.4-1	
1958	205.33	18.03	11.70	8.01	2.07	0.43	29⅛ - 19⅝	12.13	23.43	1.6-1	
1959	242.30	16.79	10.26	7.14	2.18	0.41	29⅛ - 19⅝	10.80	19.79	1.6-1	
1960	265.00	11.17	6.39	3.66	1.06	0.33	23 - 17½	14.79	14.80	1.3-1	

¹Reflects merger with Clinchfield Coal Corp. ²Incl. spec. cr. of $0.33 in 1962. Per shr. data adj. for 5% stk. divs. in 1955 thru 1960 & 4% in 1961 & 1964, & 3% & 3-for-1 split in 1956.

ROCHESTER & PITTSBURGH COAL CO. — YEARS TO DEC. 31

Funded Debt: $4,147,000; Pfd., 30,498 Shs., $5 Non-Cum., $100 Par; Com., 794,150 Shs., No Par.

1955	34.36	1.20	60.62	60.62	60.05	Nil	17⅛ - 12⅝	28.06	6.39	2.0-1	
1956	41.96	1.61	60.62	60.62	²1.13	Nil	17⅛ - 12⅝	28.06	6.39	2.0-1	
1957	23.84	1.85	0.05	0.13	0.08	0.05⅔	17⅛ - 9⅞	23.43	8.79	4.5-1	
1958	20.03	2.10	0.32	0.30	0.26	0.10⅔	13 - 9⅞	23.43	8.66	3.8-1	
1959	23.14	2.42	0.42	0.44	0.34	Nil	13 - 9⅞	23.01	8.98	4.3-1	
1960	18.33	2.68	60.60	60.58	60.54	Nil	13 - 9⅞	23.01	8.98	4.3-1	
1961	16.09	2.69	61.30	61.46	61.37	Nil	9⅞ - 9⅞	23.01	8.98	4.3-1	
1962	10.21	1.11	0.31	0.02	60.07	0.33⅓	9 - 7½	24.60	14.66	4.5-1	
1963	10.66	2.82	0.31	0.07	0.03	0.33⅓	9 - 7½	24.60	14.66	4.5-1	
1964	49.43	1.78	1.27	0.93	1.13	0.33⅓	11⅛ - 7½	25.05	13.50	4.4-1	
1965	48.52	2.82	1.27	0.97	1.17	0.33⅓	11⅛ - 9⅞	25.05	13.50	4.4-1	
1966	38.68	2.82	60.31	60.17	60.21	Nil	9⅞ - 9⅞	21.98	11.13	3.9-1	

Per shr. figs. adj. for 3-for-1 split in 1962. ¹Incl. spec. chg. of $2.43 a sh.

UNITED ELECTRIC COAL COS. — YEARS TO DEC. 31

Funded Debt: None; Com., 673,070 Shs., $5 Par, 57.7% owned by Gen. Dynamics.)

1955	23.2	1.42	1.42	1.47	²1.65	1.60	27⅞ - 22½	43.03	1.87	5.0-1	
1956	23.5	1.42	1.42	1.46	²1.61	1.60	27⅞ - 22½	43.03	1.87	5.0-1	
1957	19.8	0.98	1.13	1.14	²1.31	1.60	25 - 20⅝	39.84	1.78	4.8-1	
1958	19.1	0.99	1.11	1.10	1.24	1.60	25 - 17⅞	39.53	1.78	4.8-1	
1959	19.3	0.44	0.63	0.62	0.69	1.60	27⅞ - 18⅝	39.39	1.78	4.8-1	
1960	19.3	0.44	0.63	0.62	0.69	1.60	27⅞ - 18⅝	39.39	1.78	4.8-1	
1961	19.3	4.85	1.11	1.11	1.30	1.60	27⅞ - 22½	39.39	1.87	4.8-1	
1962	19.2	4.60	1.04	1.04	1.20	1.60	27⅞ - 22½	39.04	1.87	4.8-1	
1963	19.4	4.52	0.97	0.97	1.13	1.60	25⅛ - 22⅝	37.83	1.84	4.7-1	
1964	19.4	4.52	0.97	0.97	1.13	1.60	25⅛ - 22⅝	37.83	1.84	4.7-1	
1965	13.3	3.15	0.19	0.69	1.01	1.60	23⅝ - 18⅞	39.11	1.18	3.5-1	

¹Aft. spec. cr. of $0.55 a sh. in 1953, $0.05 in 1954, & $0.03 in 1955. ²Yr. end. Jul. 31 pr. to 1961.

³Before depreciation. 4—Deficit.

WESTMORELAND COAL CO. — YEARS TO DEC. 31

Funded Debt: $1,572,500 Cap. stk., 1,016,745 Shs., $10 Par.

	Revenues	*Quar. Div.	Net Inf. Years	Net Income	Common $ Per Share Price Range (Calendar Yrs.)			Net Wkg. Cap. (Mil. $)	Book Value	Com. Div.	Curr. Ratio Assets To Liabs.
	($ Millions)				Earn.	Div.					
1956	16.36	0.42	3.21	3.21	3.05	0.92	54½ - 37½	22.05	7.61	3.5-1	
1957	16.43	0.42	3.13	3.13	2.94	0.77	57½ - 37½	21.58	7.55	3.4-1	
1958	13.39	0.37	2.39	2.39	2.19	0.77	57½ - 37½	19.13	4.97	3.1-1	
1959	11.76	0.37	60.07	60.07	60.11	Nil	37½ - 37½	19.13	4.97	3.1-1	
1960	12.12	0.92	0.03	0.03	³0.01	Nil	4 - 4½	19.03	4.44	4.4-1	
1961	11.32	0.92	60.48	60.48	³60.46	Nil	4 - 4½	19.03	4.44	4.4-1	
1962	13.44	1.18	0.33	0.33	0.17	0.17	11½ - 4	19.03	4.44	4.1-1	
1963	15.11	1.63	0.56	0.56	0.39	0.68	14⅝ - 10⅛	19.79	5.00	4.1-1	
1964	17.27	2.03	1.17	1.17	0.97	0.77	17⅝ - 14⅝	21.07	5.97	4.1-1	
1965	17.27	2.03	1.17	1.17	0.97	0.77	17⅝ - 14⅝	21.07	5.97	4.1-1	
1966	18.00	2.28	1.31	0.96	1.41	0.88	20 - 16⅝	19.00	5.89	3.3-1	

¹Represents combined spirs. of Stonega Coke & Coal Co. and Westmoreland Coal Co. in 1962 & 1964; Stonega Coke only in prior years. ²Incl. spec. chgs. of $0.47 in 1960 & $2.12 in 1958. ³Per shr. figs. adj. for splits of 4-for-1 in 1957 and 3.5-for-1 in 1961.

KEIGLEY COAL & COKE CO. — YEARS TO DEC. 31

Funded Debt: None; Com., 475,037 Shs., $10 Par.

1960	17.60	1.73	1.60	1.60	2.14	1.60	41¼ - 35⅛	28.64	4.82	2.5-1	
1961	17.57	1.94	1.70	1.61	2.13	1.60	41¼ - 34	27.95	4.85	2.5-1	
1962	16.63	1.77	0.73	0.73	0.98	1.60	38⅝ - 34	27.77	4.84	2.5-1	
1963	16.62	1.77	0.73	0.73	0.98	1.60	38⅝ - 34	27.77	4.84	2.5-1	
1964	16.98	1.44	1.08	1.08	1.43	1.60	37½ - 32½	28.16	4.80	2.6-1	
1965	16.98	1.44	1.08	1.08	1.43	1.60	37½ - 32½	28.16	4.80	2.6-1	
1966	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1967	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1968	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1969	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1970	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1971	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1972	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1973	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1974	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1975	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1976	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1977	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1978	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1979	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1980	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1981	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1982	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1983	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1984	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1985	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1986	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1987	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1988	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1989	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1990	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1991	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1992	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1993	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1994	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1995	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1996	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1997	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1998	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
1999	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	
2000	15.16	1.44	0.77	0.77	1.03	0.75	37½ - 32½	28.16	4.80	2.6-1	

Per shr. figs. adj. for stk. divs. of 5% in 1958 & 5% in 1959.

Preferred Stocks

	Fiscal Year Ended	Shares Outstg. (000's)	Par Value $	Call Price $	Earnings $ Per Share 1961	1962	1963	1964	1965	Current Dividend Rate $	1964 Price Range High	1964 Price Range Low	1965 Price Range High	1965 Price Range Low
①Peabody Coal $1.85	12-31	100	20	26	72.00	76.33	91.67	113.40	119.64	1.85	37½	35¼	37½	34½

①New York Stock Exchange.

Information has been obtained from sources believed to be reliable, but its accuracy and completeness, and that of the opinions based thereon are not guaranteed. Printed in the United States of America.

GX 27

KIRKLAND, ELLIS, HODSON, CHAFFETZ & MASTERS
PRUDENTIAL PLAZA
CHICAGO, ILLINOIS 60601
TELEPHONE RANDOLPH 6-2600

WASHINGTON OFFICE
WORLD CENTER BUILDING

March 26, 1968

John T. Cusack, Esquire
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634 United States Courthouse
219 South Dearborn Street
Chicago, Illinois 60604

Re: United States v. General Dynamics, et al.

Dear Mr. Cusack:

In connection with paragraph four of my letter to you of March 20, 1968, I enclose herewith the additional information requested with respect to payment of dividends by UEC. I am advised that UEC neither declared nor paid any dividends in 1967.

In connection with paragraph seven of my letter, I also enclose a copy of the proxy statement issued in connection with the acquisition of Material Service Corporation by General Dynamics.

Yours very truly,

Reuben L. Hedlund

RLH:ew
Enclosures

DEPARTMENT OF JUSTICE
MAR 27 1968
DIVISION OF RECORDS

Dividends Declared & Paid by

THE UNITED ELECTRIC COAL COMPANIES
DURING THE PERIOD JANUARY 1, 1950
TO DECEMBER 31, 1967

Date Declared	Date Paid	Dividend Per Share
January 20, 1950	March 10, 1950	$.25
May 19, 1950	June 12, 1950	.25
July 21, 1950	September 11, 1950	.25
October 27, 1950	December 20, 1950	Stock Dividend-One (1) Share for each Five (5) Shares Held.
October 27, 1950	December 1[illegible], 1950	.25
January 19, 1951	March 9, 1951	.25
April 20, 1951	June 11, 1951	.25 Reg.-25¢ extra.
July 20, 1951	September 10, 1951	.25 Reg.-25¢ extra.
October 26, 1951	December 10, 1951	.25 Reg.-25¢ extra.
January 18, 1952	March 10, 1952	.25 Reg.-25¢ extra.
April 18, 1952	June 10, 1952	.25 Reg.-25¢ extra.
July 14, 1952	September 10, 1952	.25 Reg.-25¢ extra.
October 31, 1952	December 10, 1952	.25
January 8, 1953	March 10, 1953	.25
May 15, 1953	June 10, 1953	.25
July 10, 1953	September 10, 1953	.25
October 30, 1953	December 10, 1953	.25
January 8, 1954	March 10, 1954	.25
May 14, 1954	June 10, 1954	.25
July 9, 1954	September 10, 1954	.25
October 29, 1954	December 10, 1954	.25
January 14, 1955	March 10, 1955	.25
May 13, 1955	June 10, 1955	.25
July 15, 1955	September 9, 1955	.25
October 28, 1955	December 9, 1955	.25
January 13, 1956	March 9, 1956	.25
May 11, 1956	June 8, 1956	.25
July 13, 1956	September 10, 1956	.25
October 26, 1956	December 10, 1956	.25
January 11, 1957	March 8, 1957	.25
May 17, 1957	June 10, 1957	.40
July 26, 1957	September 10, 1957	.40
October 25, 1957	December 10, 1957	.40
January 24, 1958	March 10, 1958	.40
May 9, 1958	June 10, 1958	.40
July 28, 1958	September 10, 1958	.40
October 31, 1958	December 10, 1958	.40
January 9, 1959	March 10, 1959	.40
May 8, 1959	June 10, 1959	.40
July 10, 1959	September 10, 1959	.40
October 30, 1959	December 10, 1959	.40
January 13, 1960	March 10, 1960	.40
May 13, 1960	June 10, 1960	.40
July 15, 1960	September 9, 1960	.40
October 28, 1960	December 9, 1960	.40

Dividends Declared & Paid By

THE UNITED ELECTRIC COAL COMPANIES
DURING THE PERIOD JANUARY 1, 1950
TO DECEMBER 31, 1967

PAGE TWO

Date Declared	Date Paid	Dividend Per Share
January 13, 1961	March 10, 1961	$.40
May 12, 1961	June 9, 1961	.40
July 14, 1961	September 8, 1961	.40
September 8, 1961	December 8, 1961	.40
January 12, 1962	March 9, 1962	.40
May 18, 1962	June 9, 1962	.45
July 13, 1962	September 10, 1962	.45
September 14, 1962	December 10, 1962	.45
January 11, 1963	March 8, 1963	.45
May 10, 1963	June 10, 1963	.45
July 12, 1963	September 10, 1963	.45
September 13, 1963	December 10, 1963	.45
January 10, 1964	March 10, 1964	.45
May 8, 1964	June 10, 1964	.45
July 10, 1964	September 10, 1964	.45
September 11, 1964	December 10, 1964	.45
February 12, 1965	March 10, 1965	.45
April 16, 1965	June 10, 1965	.45
August 13, 1965	September 10, 1965	.45
October 8, 1965	December 10, 1965	.45
February 14, 1966	March 10, 1966	.45
April 15, 1966	June 10, 1966	.45
August 12, 1966	September 9, 1966	.45
November 9, 1966	November 20, 1966	$6,000.00
Year - 1967	None	None

KIRKLAND, ELLIS, HODSON, CHAFFETZ & MASTERS
PRUDENTIAL PLAZA
CHICAGO, ILLINOIS 60601
TELEPHONE RANDOLPH 6-2000

WASHINGTON OFFICE
WORLD CENTER BUILDING

May 3, 1968

John T. Cusack, Esquire
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634 United States Courthouse
219 South Dearborn Street
Chicago, Illinois 60604

Re: United States v. General Dynamics, et al.

Dear Mr. Cusack:

Pursuant to paragraph 18 of the Government's draft Motion to Produce and paragraph 4 of my letter to you of March 20, 1968, this is to advise you that the following loans were made by UEC to General Dynamics between January 1, 1950 and present time: (1) on September 22, 1966 a loan in the amount of $1 million at 6 per cent interest due December 30, 1966; and (2) a loan in the amount of $1 million on October 31, 1966 at 6 per cent interest due December 30, 1966.

Both loans were repaid on December 29, 1966. UEC has never made any loans to either Freeman or Material Service.

I must correct information transmitted to you with my letter of March 26, 1968. I am now advised that UEC declared and paid, on January 24 and 25, 1968, respectively, a dividend in the amount of $1,500,000 to General Dynamics. No other dividends were declared or paid during 1967.

I apologize for the error, which was caused by the failure to include dividends paid by the "new" UEC as well as those by "old" UEC.

Yours very truly,

Reuben L. Hedlund

60-1-37-420
DEPARTMENT OF JUSTICE
MAY 6 1968
DIVISION OF RECORDS

RLH:eu
Cusack

GX 29

EXECUTIVE OFFICE OF THE PRESIDENT / BUREAU OF THE BUDGET

STANDARD INDUSTRIAL CLASSIFICATION MANUAL

1967

PREPARED BY THE OFFICE OF STATISTICAL STANDARDS

* * *

Major Group 12.—BITUMINOUS COAL AND LIGNITE MINING

The Major Group as a Whole

This major group includes establishments primarily engaged in producing bituminous coal or lignite. Included are mining operations and preparation plants (also known as cleaning plants and washeries) whether or not such plants are operated in conjunction with the mines served. The production of coal fuel briquettes and packaged fuel is classified in Major Group 29, and the production of manufactured gas from coal in Industry 4925.

Group No. Industry No.

121 BITUMINOUS COAL AND LIGNITE MINING

1211 Bituminous Coal

Establishments primarily engaged in producing bituminous coal or in developing bituminous coal mines. This industry includes underground mining, auger mining, strip mining, and coal cleaning, crushing, screening, and sizing plants, whether or not operated in conjunction with the mines served.

Cleaning plants, bituminous coal
Coal mining, bituminous
Crushing plants, bituminous coal
Hard coal mining, except Pennsylvania anthracite
Screening plants, bituminous coal
Semianthracite mining
Strip mining, bituminous coal: except on a contract, fee, or other basis
Subbituminous coal mining
Washeries, bituminous coal

1212 Lignite

Establishments primarily engaged in producing lignite or in developing lignite mines.

Brown coal mining
Lignite mining

1213 Bituminous Coal and Lignite Mining Services

Establishments primarily engaged in performing for others on a contract, fee, or other basis bituminous coal and lignite mining services, such as the removal of overburden, strip and auger mining, drilling, shaft sinking, and mine tunneling.

Auger mining services, bituminous or lignite: on a contract, fee, or other basis
Bituminous coal mining services: on a contract, fee, or other basis
Draining or pumping bituminous coal and lignite mines: on a contract, fee, or other basis
Drilling for bituminous coal and lignite mining: on a contract, fee, or other basis
Lignite mining services: on a contract, fee, or other basis
Mine tunneling, bituminous coal and lignite: on a contract, fee, or other basis
Removal of overburden for bituminous coal: on a contract, fee, or other basis
Sinking shafts for bituminous coal and lignite mining: on a contract, fee, or other basis
Strip mining, bituminous coal: on a contract, fee, or other basis
Stripping services, lignite: on a contract, fee, or other basis
Tunneling, bituminous coal and lignite mining: on a contract, fee, or other basis

Appendix D

Criteria for Recognizing Industries in the Standard Industrial Classification

General Comments

The Standard Industrial Classification defines industries in accordance with the existing structure of the American economy. An industry is a grouping of establishments primarily engaged in the same or similar lines of economic activity. In the manufacturing division, the line of activity is generally defined in terms of the product made, materials consumed, or process of manufacture used.

Sometimes a common process of manufacture may result in an industry of considerable size and a wide variety of products; e.g., meat packing, and blast furnaces, steel works and rolling mills. In other instances, the production of an industry may be limited to a single product, such as chewing gum or wallpaper. To be recognized as an industry each group of establishments must have significance from the standpoint of number of production workers, value added by manufacture, value of shipments, and number of establishments. Size of an industry is not the sole criterion for its recognition; it is also important that an industry comprise a group of establishments of which the output of products or processes defining the industry (primary products of the industry) account for a relatively high proportion of (a) the total shipments or receipts of the industry (specialization ratio), and (b) the total output by all industries of the products or processes which are primary to the industry (coverage ratio).

The quantitative standards for size, specialization and coverage for manufacturing industries that have been established are described in subsequent paragraphs. There may be a few instances where other important considerations will warrant the establishment or retention of an industry which does not satisfy size, specialization, and coverage criteria.

As a result of the application of these criteria, there will be "leftover" segments of American industry. Lines of business activity which do not satisfy the criteria for the recognition of an industry, if they are very closely associated with the activities of another industry, may be included with that industry. This may have the effect of reducing the specialization ratio of the industry with which this line of activity is combined, but such a procedure may be preferable

to including the line of activity in a "miscellaneous" or "not elsewhere classified" category for that particular three digit group. Each case must be evaluated on its own merits. It may be better to allow a small element of impurity to be introduced into a given four digit industry by associating it with a line of activity which is quite closely related rather than to increase the size of the "miscellaneous" category for the three digit group by adding another line of activity, since the "miscellaneous" categories are heterogeneous and are not representative of any specific industry.

Standards for Criteria

As a result of the Census of Manufactures, data (number of establishments, employment, value added, etc.) are available for manufacturing as a whole. Knowing the number of industries, values for each desired item have been calculated for an "average" industry. These values for the "average" industry were used as the basis for measuring size. For each desired item, a number of points were awarded an industry, depending on the industry's relationship to the size of the "average" industry. The points awarded were equal to the percent of the "average" industry. The points for the various items were averaged with a system of weights to secure the final score for an industry. The score determines whether the industry is to be considered sizable or not.

Size Criteria:

Size was measured by a comparison of four items as follows:

1. Number of employees
2. Value added by manufacture
3. Value of shipments
4. Number of establishments

Number of employees and value added are recognized as being more significant and reliable measures of industry size than are value of shipments and number of establishments. Value of shipments includes the value created in other industries or other economic divisions such as Agriculture, etc., and does not measure value of income produced in the specific manufacturing industry. In some instances, the large duplication of value of shipments within an industry makes publication of the figure meaningless. A count of establishments in each industry is of limited significance as it treats both large and small establishments as of equal importance. In addition, the derivation of an "average" number of establishments per industry reflects, to a large extent, the very numerous plants in a relatively few industries. For example, five industries (Bakeries, Sawmills, Newspapers, Commercial Printing, and Concrete Products) account for approximately 22% of the number of establishments, but only 8% of the number of employees and value added by manufacture.

Generally speaking, an existing Standard Industrial Classification industry is considered as sizable if it attains a point score of 10 or higher. The point

* * *

The Consumption of Fuel by Steam-Electric Plants in the Eastern Interior Province Sales Area for the Years 1960-1967

Year	Notes	Per Cent of Consumption in BTU		
		Coal	Oil *	Gas *
1960	1	93.8	00.2	06.0
1961	2	90.5	00.1	09.4
1962	3	90.2	00.1	09.7
1963	4	90.4	00.1	09.5
1964	5	89.9	00.1	10.0
1965	6	91.4	00.1	08.5
1966	7	93.1	00.2	06.7
1967	8	92.2	00.2	07.7

* In Kurtz Deposition Exhibits 1 and 2, which cover the years 1960 and 1961, the BTU values for gas and oil are not shown for each generating station as is done in Kurtz Dep. Ex. 3-8. In the "Explanation of Tables" in Kurtz Dep. Ex. 1 and 2 appears this statement:

> "The BTU of fuel oil and of natural gas are not shown as the values in the great majority of cases were fairly well standardized, i.e., at between 147 and 153 thousand BTU per gallon of oil, and 950 to 1,050 BTU per cubic foot of natural gas."

The averages of 147 and 153 or 150 thousand BTU per gallon of oil, and 950 and 1,050 or 1,000 BTU cubic foot of natural gas were used to convert gallons of oil and cubic feet of gas to BTUs for the years 1960 and 1961.

GX 32

CONSUMPTION OF FUEL (SHOWN IN MILLIONS OF BTU'S) BY PORTLAND CEMENT PLANTS IN ILLINOIS IN 1967

Fuel	Number of BTU's (In Millions)	Each Fuel as Per Cent of Total
Coal	11,338,430	94.6
Oil	134,365	1.1
Gas	517,710	4.3
Total	11,990,505	100.0

Source: Letters from cement companies and answers to questionnaires.

Revised

CONSUMPTION OF FUEL (SHOWN IN MILLIONS OF BTU'S)BY PORTLAND CEMENT PLANTS IN EASTERN INTERIOR COAL PROVINCE SALES AREA IN 1967

Fuel	Number of BTU's (In Millions)	Each Fuel as Per Cent of Total
Coal	48,025,650	74.1
Oil	324,544	.5
Gas	16,424,242 */	25.4
Total	64,774,436	100.0

*/ Approximately 96.3 per cent of gas consumption was on an interruptible basis.

Source: Letters from cement companies and answers to questionnaires.

GOVERNMENT EXHIBIT 34

GENERAL DYNAMICS CORPORATION
INCOME STATEMENT

The United Electric Coal Companies
DATE 12/31/68

LINE			AMOUNT	
1	MONTH			
2	NET SALES		956	855
3	COST OF SALES	1	415	489
4				
5	OPERATING PROFIT (LOSS)		(458	634
6	OTHER INCOME (EXPENSE)			
7	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES			
8	INTEREST INCOME			26
9	INTEREST EXPENSE			-
10	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)			-
11	MISCELLANEOUS NET		102	135
12				
13	PRETAX PROFIT (LOSS)		(356	473
14	PROVISION FOR INCOME TAXES		(120	000
15	NET INCOME (LOSS)		(236	473)
16				
17	SALES - INTERCOMPANY		12	778
18	- INTERDIVISION			-
19				
20	INVESTMENT CREDIT		(36	040)
21				
22				
23				
24	YEAR TO DATE			
25	NET SALES	22	940	876
26	COST OF SALES	19	289	847
27				
28	OPERATING PROFIT (LOSS)	3	651	029
29	OTHER INCOME (EXPENSE)			
30	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES			-
31	INTEREST INCOME		3	538
32	INTEREST EXPENSE			-
33	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)			-
34	MISCELLANEOUS NET		354	426
35				
36	PRETAX PROFIT (LOSS)	4	008	993
37	PROVISION FOR INCOME TAXES	1	327	000
38	NET INCOME (LOSS)	2	681	993
39				
40	SALES- INTERCOMPANY		900	082
41	- INTERDIVISION			-
42				
43	INVESTMENT CREDIT		21	960
44				
45	SALES- RENEGOTIABLE			-
46	- NONRENEGOTIABLE	22	940	876
47	TOTAL (LINE 25)	22	940	876
48				
49	STATISTICAL DATA			
50	NET SALES (LINE 25)	22	940	876
51	LESS: SUPPORT DIVISIONS SALES			-
52	DIVISION SALES BASE	22	940	876
53				
54	DEPRECIATION, AMORTIZATION, ETC.	2	692	454
55	DEPLETION IN EXCESS OF COST	1	363	069
56	DIVIDENDS RECEIVED - FROM SUBSIDIARIES			-
57	- OTHERS			100
58				
59				
60				

REPORT FROM The United Electric Coal Companies
DATE 12/31/68

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

(DOLLARS)

The United Electric Coal Companies

DATE 12/31/68

LINE	CLASSIFICATION	AMOUNT		
1	CASH		116	080
2	MARKETABLE SECURITIES			
3	RECEIVABLE – GOVERNMENT			
4	– TRADE (LESS RESERVES)	1	274	166
5	UNREIMBURSED EXPENDITURES			
6	INVENTORIES	2	797	102
7	LESS: ADVANCE AND PROGRESS PAYMENTS			
8	NET INVENTORIES	2	797	102
9	PREPAID EXPENSES		426	011
10	INTERCOMPANY RECEIVABLES	7	919	158
11				
12				
13	TOTAL CURRENT ASSETS	12	532	519
14				
15	INVESTMENTS (COST) AND ADVANCES – SUBSIDIARIES			
16	EQUITY, IN EXCESS OF COST – UNCONSOL SUBSIDIARIES			
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS		750	885
18	EQUIPMENT LEASED TO OTHERS			
19	PROPERTY, PLANT AND EQUIPMENT – GROSS	55	906	801
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	40	441	861
21	PROPERTY, PLANT AND EQUIPMENT – NET	15	464	940
22				
23	TOTAL ASSETS	28	748	344
24				
25	NOTES PAYABLE TO U.S. BANKS			
26	NOTES PAYABLE TO CANADIAN BANKS			
27	COMMERCIAL PAPER			
28	DRAFTS PAYABLE			
29	CURRENT INSTALLMENTS ON LONG-TERM DEBT			
30	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	1	231	426
31	PRODUCTION PAYMENTS – NET OF TAXES			
32	ACCRUED SALARIES AND WAGES		416	120
33	U.S. AND CANADIAN INCOME TAXES		160	459
34	CUSTOMERS' DEPOSITS			
35	DIVIDENDS PAYABLE			
36	INTERCOMPANY PAYABLES			
37	Accounts Payable Residual Shareholders		8	900
38	TOTAL CURRENT LIABILITIES	1	816	905
39	LONG-TERM DEBT (LESS CURRENT PORTION)			
40	OTHER LIABILITIES			
41	DEFERRED REVENUE FROM ASSIGNED LEASES			
42	DEFERRED INCOME TAX			
43	MINORITY INTERESTS			
44	INTERDIVISION ACCOUNTS			
45				
46	UNREALIZED PROFIT – INTERCOMPANY			
47	– INTERDIVISION			
48				
49	SHARE OWNER'S EQUITY			
50	CAPITAL STOCK		1	000
51	TREASURY STOCK			
52	CAPITAL SURPLUS	5	273	484
53				
54	EARNED SURPLUS, BEGINNING OF YEAR	18	974	962
55	NET INCOME (LOSS)	2	681	993
56	DIVIDENDS – CAPITAL STOCK			
57				
58	EARNED SURPLUS, END OF PERIOD			
59	TOTAL SHARE OWNERS' EQUITY	21	656	955
60	TOTAL LIABILITIES AND EQUITY	26	931	439
		28	748	344

REPORT FROM The United Electric Coal Companies

DATE 12/31/68

811.1 8/68

GENERAL OFFICES
MUNICIPAL BUILDING
SPRINGFIELD, ILLINOIS 62701

water light & power

GOVERNMENT EXHIBIT
35

JOHN H. HUNTER
COMMISSIONER OF PUBLIC PROPERTY
Telephone 544-5721, Area Code 217

March 21, 1968

Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Attention: Mr. John T. Cusack

RE: United States v. General Dynamics Corporation et al., Civil No. 67 C 1632 (N. D. Illinois)

Dear Sir:

As our Lakeside Generating Station is a coal burning plant we have no answers for paragraphs 2, 3 and 4. Data for our answer to paragraph 1 is attached herewith.

An engineering answer to a legally phrased question has presented unanswerable questions. You ask, "Please state the annual BTU and kilowatt hour output derived from each supplier, and the percentage of total (all sources) BTU and kilowatt hour output each supplier represents for each of the years 1964 through 1967."

We buy coal from several suppliers under contracts for terms from one to three years. Each contract has the following:

1. Guaranteed cost in dollars per ton F.O.B. mine.
2. Cost of haulage in dollars per ton - mine to Lakeside.
3. Guaranteed BTU's per pound.
4. Guaranteed moisture content.
5. Guaranteed ash content
6. Guaranteed sulphur content.

from item 1 and 3 the guaranteed cost F.O.B. mine in dollars per million BTU can be calculated.

Released
62-0-37-1200
DEPARTMENT OF JUSTICE
MAR 22 1968
DIVISION OF RECORDS

All coal is sampled as received at Lakeside, analyzed by a commercial testing firm for BTU, moisture, ash and sulphur. Based on contract stated per missable percentage deviations of each value of the analysis the cost of that shipment of coal is determined to be: (a) contract price, (b) contract price plus a bonus, or (c) contract price minus a penalty. If either party is not satisfied with the pricing because of a bonus or penalty a referee sample is sent to another commercial firm and the pricing is then recalculated.

Our experience has been for all suppliers that there are few bonuses and many penalties. As an example for 1967 only on the semi-monthly coal shipments and billings:

Peabody had 3 bonuses and 4 penalties,
Freeman had no bonuses and 12 penalties,
Little Dog had no bonuses and 24 penalties,
Royal Fuel had no bonuses and 24 penalties.

It should be noted that these bonus or penalty determinations are based on BTU, moisture, ash and sulphur, hence the existence of a penalty does not always indicate a low BTU content as many were due to moisture and ash penalties.

After the coal is received and tested it goes into either the active coal storage or the reserve coal storage. As the coal is used it is taken from either pile, but mostly from active storage, and put into the bunkers to feed any of the eight boilers for any of the seven generators. For this reason it is impossible to give the KWH generated from each coal supplier, and the B.T.U. supplied by each supplier for these KWH.

Hence the attached data gives the tons bought from each supplier, the cost of coal including bonuses and penalties and the gross generation for the year in KWH. It should be noted that the total tons of coal bought for the year did not exactly produce the total gross generation in KWH for that year because of additions or removals of coal from reserve storage.

We have no data as referred to in paragraph 5. Without surveys or memoranda as supporting evidence we can say that we

have always been a coal burning utility. In the earlier years all our coal came from Springfield mines or Sangamon County mines near Springfield, which was both good business and politically wise to patronize local coal firms. As the Springfield and Sangamon County mines were mined out, we of necessity have to go farther for our coal. As for oil we have always been too large for diesel generation. As for nuclear generation we were too small to consider it and considering the increasing size of nuclear units that are now being planned or installed, we will be too small for many years to come. As for gas as boiler fuel it was both more expensive than local coal and unavailable.

Very truly yours,

C. P. Hafel

C. P. Hafel
Planning Engineer

cc: Lee E. Nickelson

CPH:jn

GENERAL OFFICES
MUNICIPAL BUILDING
SPRINGFIELD, ILLINOIS 62701

water light & power

JOHN H. HUNTER
COMMISSIONER OF PUBLIC PROPERTY
Telephone 544-5731, Area Code 217

COAL PURCHASES

Coal Supplier	1964		1965	
	Tons	Cost	Tons	Cost
Freeman Coal Mng. Co.	95,192.86	$515,930.37	118,537.02	$606,909.51

Coal Supplier	1966		1967	
	Tons	Cost	Tons	Cost
Freeman Coal Mng. Co.	133,396.47	$692,864.87	135,676.91	$715,831.36
Peabody Coal Co.	104,183.00	550,562.67	101,578.59	554,184.72
C. V. Beck & Co.	84,441.64	456,334.63	82,552.88	449,141.05
Royal Fuel Corp.	16,841.96	85,937.81	15,911.96	82,360.30
Total for year	338,863.07	$1,785,699.98	335,720.34	$1,791,517.43
Gross Generated KWH	581 679 200 KWH		568 871 200 KWH	

Note: C. V. Beck & Co. name changed October 1967 to St. Louis Industrial Coal Sales
Eddy Coal Co. Cantrall, Illinois out of operation. Mined out.
R & S Coal Co. Cantrall, Illinois out of operation. Mined out.

CPH:jn
3/21/68

GOVERNMENT EXHIBIT
36

ILLINOIS POWER COMPANY

500 SOUTH 27TH STREET, DECATUR, ILLINOIS 62525

March 12, 1968

Mr. Donald F. Turner
Assistant Attorney General
Department of Justice
Room 2634, United States Courthouse
Chicago, Illinois 60604

Attention: Mr. John T. Cusack
Attorney, Midwest Office
Antitrust Division

Re: United States v. General Dynamics Corporation et al., Civil No. 67 C 1632 (N. D. Illinois)

Dear Mr. Turner:

In response to your letter of February 26, 1968, we are enclosing information as you have asked relating to our fuel purchases.

At this writing we have not completed calculating the information to give the BTU and Kilowatt Hour output derived from each supplier, etc., as asked for in Paragraph (1) one of your letter. We hope to send this to you within the next couple of days.

Very truly yours,

A. Kraakevik
Vice President

AK/g
Encl.

DEPARTMENT OF JUSTICE
MAR 13 1968
DIVISION OF RECORDS

Decatur, Illinois
March 12, 1968

Illinois Power Company
Generation by Other than Coal Energy Sources

Coal -- with the exception of interruptible gas at one generating station -- has an economic advantage over other energy sources in our service area under present conditions.

Gas for electric generation is supplied to 6 of our boilers on an interruptible basis and, therefore, is on a seasonal basis. Interruptible gas available to 2 boilers which were equipped last year for gas firing is economical when compared to the coal available to these boilers. Gas supply information is listed below for the years 1964 through 1967.

		BTU's Consumed		Approx. KWH Output (*)	
Year	Cost	BTU's (10^{-6})	% Total	KWH (10^{-3})	% Total
1964	$478,527	2,370,072	4.1	215,000	3.9
1965	212,339	1,051,635	1.5	94,000	1.4
1966	91,425	425,541	0.6	39,000	.6
1967	375,879	1,789,798	2.5	167,000	2.4

*Gas when available and when economically advantageous is normally used coincidentally with coal. Therefore, the kilowatt hour output produced by gas must be approximated.

Fuel oil is used at three small peaking plants of which one was installed last year. The millions of BTU's consumed, the cost thereof and kilowatt hours produced therefrom during the years 1964 through 1967 were as follows:

		BTU's Consumed		Kwh Produced	
Year	Cost	BTU's (10^{-6})	% Total	KWH (10^{-3})	% Total
1964	$ 533	707	.001	53	.001
1965	519	657	.001	57	.001
1966	1,844	2,278	.003	194	.003
1967	9,656	12,617	.018	657	.009

Fuel oil is also used in our major stations for boiler startup and for setting boiler safety valves following boiler internal inspections and repairs. Any generation resulting from this fuel oil usage is negligible and is incidental to the purpose of using the fuel oil. The millions of BTU's consumed and the cost thereof of oil used in our major station during the years 1964 through 1967 were as follows:

BTU's Consumed

Year	Cost	BTU's (10^{-6})	% Total
1964	$ 76,259	119,959	.207
1965	52,863	77,903	.078
1966	52,262	75,863	.074
1967	37,285	52,727	.052

Fuel oil is seasonal to the extent that the greatest usage at the peaking plants is during the summer months and the greatest usage at the major stations is during other than summer months.

Nuclear - Illinois Power Company does not have facilities for generating electricity by utilizing nuclear energy.

Hydroelectric - Illinois Power Company has one small hydro-electric plant. The kilowatt hour output and the % of total from this plant for the years 1964 through 1967 were as follows:

Kwh Produced

Year	Kwh (10^{-6})	% Total
1964	18,593	.34
1965	16,638	.25
1966	16,599	.24
1967	16,475	.24

ILLINOIS POWER COMPANY
1966 COAL TONNAGE & COST

	Havana	Hennepin	Vermilion	Wood River	Total Tons	Total Dollars
Beck	—	10,875	—	164,308	175,183	$ 760,681.00
Deep Valley	—	—	356	—	356	886.00
Deep Vein	—	—	15,173	—	15,173	66,609.00
Dinsmore—Two Rivers	—	—	2,652	—	2,652	10,873.00
Floyd Lee	—	—	8,373	—	8,373	31,817.00
Freeman	—	—	126,252	158,019	284,271	1,312,949.00
Great Lakes Carbon	—	—	—	70,209	70,209	354,555.00
Kiesel	—	—	—	26,843	26,843	94,755.00
O'Keefe Coal Co.	—	—	63,411	—	63,411	291,690.00
Old Ben	—	—	2,037	56	2,093	10,638.00
Peabody—Bright Star	—	77,775	—	—	77,775	395,874.00
Peabody—Chiefton	—	—	47,281	—	47,281	221,747.00
Peabody—Edwards	—	64,361	—	—	64,361	328,241.00
Peabody—Green Diamond (Conv)	—	—	—	2,575	2,575	11,664.00
Peabody—Key	—	149,903	—	—	149,903	764,505.00
Peabody—River King	—	120,823	—	61,463	182,286	934,496.00
Peabody—S. W. (Unit)	—	—	—	1,042,803	1,042,803	4,338,060.00
Peabody—S. W. (Conv.)	—	—	—	86,527	86,527	165,467.00
Peabody—Utility	—	—	—	72	72	288.00

	Havana	Hennepin	Vermilion	Wood River	Total Tons	Total Dollar
Peabody—Western Ky.	—	27,506	—	—	27,506	155,959.00
Republic—Elk #1	—	—	—	3,714	3,714	14,447.00
Republic—Harmattan (2X0)	—	—	41,248	—	41,248	210,364.00
Republic—Harmattan (¼x1¼)	—	—	142,299	—	142,299	614,731.00
Republic—T Bird	—	117,218	—	—	117,218	608,361.00
Republic—Shauneetown	—	25,732	—	—	25,732	138,952.00
Royal Fuel	—	—	—	2,352	2,352	8,796.00
Southern Ill. Co-op	—	—	356	9,147	9,503	37,329.00
Truax Traer	342,390	14,596	—	—	356,986	1,753,239.00
United Electric—Banner	—	64,285	—	—	64,285	330,424.00
United Electric—Buckheart	—	98,790	—	—	98,790	507,780.00
V-Day	—	—	10,675	—	10,675	30,957.00
Total Tons Received	342,390	701,864	460,113	1,578,088	3,152,455	$14,507,149.00
	($1,681,134.90)	($4,012,430.52)	($2,126,883.20)	($6,686,720.61)		($14,507,149.00)

ILLINOIS POWER COMPANY
1967 COAL TONNAGE & COST

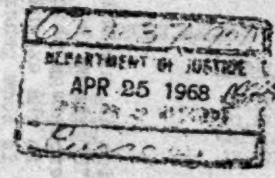
	Havana	Hennepin	Vermilion	Wood River	Total Tons	Total Dollar
Beck—Little Dog	—	7,157	—	61,672	68,829	$ 302,064.90
Bell & Zoller	—	—	—	1,641	1,641	7,663.47
Dinsmore—Two Rivers	—	—	260	—	260	1,107.60
Floyd Lee—Western Brick	—	—	5,839	—	5,839	23,939.90
R. Lee—Deep Valley	—	—	55	—	55	136.95
Freeman	—	—	36,801	181,946	218,747	977,371.92
Kiesel	—	—	—	24,260	24,260	87,336.00
O'Keefe—DeSota	—	—	—	1,495	1,495	6,727.50
O'Keefe—Shelburn	—	—	92,359	—	92,359	455,329.87
O'Keefe—Jasonville	—	—	34,294	—	34,294	169,562.42
O'Neil	—	—	56	—	56	280.00
Peabody—Bright Star	—	64,626	—	—	64,626	332,177.64
Peabody—Chiefton	—	—	66,204	—	66,204	324,399.60
Peabody—Edwards	—	129,881	—	—	129,881	668,887.15
Peabody—Green Diamond	—	—	—	3,940	3,940	17,927.00
Peabody—River King	—	207,285	—	45,611	252,896	1,368,326.05
Peabody—River Queen	—	1,452	—	—	1,452	8,305.44
Peabody—S. W. (Unit)	—	—	—	1,166,063	1,166,063	4,874,143.34
Peabody—S. W. (Conv.)	—	—	—	200,827	200,827	911,487.85

	Havana	Hennepin	Vermilion	Wood River	Total Tons	Total Dollar
Republic—Elk #1	—	—	—	14	14	665.00
Republic—Murdock	—	—	23,678	—	23,678	127,624.42
Republic—Liberty #3 (2X0)	—	—	34,474	—	34,474	186,504.34
Republic—Harmattan (¼x1¼)	—	—	185,145	—	185,145	1,018,297.50
Republic—T Bird (Ayshire)	—	89,405	—	—	89,405	482,787.00
Republic—Crab Orchard	—	3,861	—	—	3,861	20,270.25
Royal Fuel	—	—	—	73	73	328.50
Truax Traer	365,018	—	—	—	365,018	1,865,241.98
Truax Traer	—	38,607	—	—	38,607	211,180.29
United Electric—Banner	—	62,100	—	68	62,168	330,057.00
United Electric—Buckheart	—	40,665	—	—	40,665	210,238.05
V-Day—Screenings	—	—	7,572	—	7,572	43,160.40
V-Day—Carbon	—	—	13,964	—	13,964	40,495.60
Total Tons Received	365,018	645,039	500,801	1,687,110	3,197,168	$15,074,024.93
	($1,365,241.98)	($3,460,034.68)	($2,914,381.44)	($7,166,544.47)		($15,074,024.93)

DAIRYLAND POWER COOPERATIVE
La Crosse, Wisconsin
54601

April 23, 1968 APR 29 1968

Mr. John T. Cusack
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604



Dear Mr. Cusack:

In answer to your letter of April 9 concerning the acquisition of United Electric Coal Companies by General Dynamics Corporation, we have assembled as much information as is immediately available.

In answer to question 1, the coal shipped by Freeman Coal Company and United Electric Coal Company was delivered to our plants at Alma and Cassville, Wisconsin. Tabulation "A" on the attached sheet shows the tonnage and the dollar amounts to each station for the years 1964-1967. All of the United Electric Coal Company's shipments came from their Fidelity Mine. The Freeman Coal Company has the option of shipping similar coals from various mines and we do not have the information as to the mine from which the coal was shipped. The dollar amount shown in Table "A" of course includes freight.

In answer to question 2, we only supply electric power and therefore do not have a BTU output. The estimated kilowatt hour output from each station by coal supplied by the two coal companies in question are shown on Table "B". Also, shown in Table "B" is the percentage of this power to our total generation.

In answer to question 3, we have two generating stations utilizing oil and gas for generation. One of these is a dual fuel diesel station - the other is a diesel station using oil only as fuel. Table "C" shows the fuel costs, KWH output, and the percentage that the output of these two plants is to the total output. The purchases of oil and gas are as seasonal as we can possibly make them because of the unrealistic high price of gas and oil.

There is a 50 megawatt second round demonstration nuclear power plant on our system that was scheduled for operation in 1965. The nuclear reactor of this power plant is owned by AEC. The turbine generator of this plant is owned by Dairyland Power Cooperative, and has been ready for operation since 1965; however, the nuclear reactor is still not in operation. As to whether our utilization of the atomic energy is seasonal, it will be used when and if it is operable.

We have one hydroelectric plant which is our only other source of generating electric power. Table "D" shows the KWH generation of this hydroelectric plant and the percentage which this generation is to the total. This is seasonal to the extent that the river flow is seasonal. Although, there is some generation every day of the year.

At the present time, studies are just being initiated for determining our future energy sources.

We trust this information satisfactorily answers your questions.

Very truly yours,

DAIRYLAND POWER COOPERATIVE

John P. Madgett
General Manager

NWM/sh
Attachments
cc: Reading File

TABLE "A"

	FREEMAN				UNITED ELECTRIC			
	ALMA		CASSVILLE		ALMA		CASSVILLE	
	TONS	COST	TONS	COST	TONS	COST	TONS	COST
1964	43,860	217,000	9,675	47,329	25,825	136,756	2,638	13,798
1965	56,620	289,327	7,147	36,166	25,308	137,674	11,063	63,539
1966	59,272	320,693	18,000	96,922	32,096	179,662	12,755	69,770
1967	77,994	448,223	26,905	151,927	35,447	203,843	7,636	43,861

TABLE "B"

KWH x 1000 (using #coal/Gross KWH)

	FREEMAN		UNITED ELECTRIC	
	ALMA	CASSVILLE	ALMA	CASSVILLE
1964	97,467	18,786	57,389	5,122
1965	124,440	13,744	55,622	21,275
1966	131,716	35,294	71,324	25,010
1967	173,320	52,243	70,894	14,827

% OF TOTAL SYSTEM OUTPUT

	FREEMAN		UNITED ELECTRIC	
	ALMA	CASSVILLE	ALMA	CASSVILLE
1964	7.06	1.36	4.16	0.37
1965	8.01	0.88	3.58	1.37
1966	7.95	2.13	4.30	1.51
1967	10.21	3.08	4.18	0.87

TABLE "C"

	TOTAL DIESEL PLANTS		
	FUEL COST	GROSS MWH	% OF TOTAL
1964	14,626	2,653	0.19
1965	46,343	9,177	0.59
1966	64,512	12,619	0.76
1967	55,101	10,412	0.61

TABLE "D"

GENOA AND FLAMBEAU

	GROSS MWH	% OF TOTAL
1964	49,066	3.56
1965	74,288	4.78
1966	81,118	4.89
1967	73,359	4.32

GOVERNMENT EXHIBIT 39

CORN PRODUCTS COMPANY
717 Fifth Avenue
New York, N. Y. 10022

Executive Offices

May 24, 1968

Department of Justice
United States Courthouse Room 2634
Chicago, Illinois 60604

Attention: John T. Cusack, Esq.

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)

Gentlemen:

I enclose herewith the material requested in your letter of April 15, concerning the above matter. I trust that it supplies you with all the information that you require.

Very sincerely yours,

/s/ Warren S. Adams, 2nd
WARREN S. ADAMS, 2ND
Vice President and
General Counsel

WSA:ed
Encs.

COMPANY LETTER

Moffett Technical Center

April 26, 1968

A. S. Wells
New York

Replying to the Department of Justice's request of April 15, 1968, the following are the answers to the numbered questions:

(1) Coal is consumed in three boilers, two of which are chain-grate stoker fired, and the third uses pulverized fuel. Steam is used for the generation of power in turbo generators and for process heating requirements and product drying.

PEKIN COAL CONSUMED

1964 - Total 180617 Tons	**(Strike reduced requirement)**			
United Electric	Cuba Mine		15380	Tons @ $4.00
			15302	4.05
			20802	4.07
		Total	51484	
Peabody	Vulcan		55245	4.00
			6401	4.05
		Total	61646	
Republic	Flamingo		61114	4.00
			4909	4.05
		Total	66023	
Pittsburg Midway	Allendale	Total	1464	4.05
1965 - Total 230073 Tons				
United Electric	Cuba		16803	4.07
			80166	4.10
		Total	96969	
Peabody	Vulcan		18272	4.07
	Bright Star		20215	4.10
		Total	38487	

Pittsburg Midway	Allendale		2089	4.07
			1965	4.10
		Total	4054	
Republic	Flamingo		14761	4.07
			18406	4.10
	Sunspot		57396	4.47
		Total	90563	

1966 - Total 230801

United Electric	Cuba		58772 Tons @	$4.10
			172029	4.15
		Total	230801	

1967 - Total 233292

United Electric	Cuba	Total	233292	4.15

(2) No other energy fuel is used at the Pekin Plant.

(3) See number (2)

(4) Attached are copies of Franzen's letters of February 12, 13, and 23, 1968 which substantiate the use of coal as the most economical fuel that we can use. Gas during the year of 1967 would have cost $845,000 more than coal, less savings of $273,000.

/s/ D. E. W.

DEWall:mm
cc: R. F. Brainard

Enclosures

UNION CARBIDE CORPORATION
270 PARK AVENUE
NEW YORK, N. Y. 10017

LAW DEPARTMENT

August 2 1968

Department of Justice
Room 2634
United States Courthouse
Chicago, Illinois 60604

Attention: John T. Cusack, Esquire
Midwest Office - Antitrust Division

Re United States v. General Dynamics Corporation, et al., Civil Action No. 67 C 1632 (N.D. Ill.)

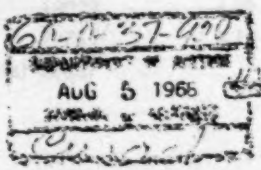
Gentlemen:

This letter is written in response to yours of July 29, 1968.

As stated in my letter of May 8, 1968, our East Chicago, Indiana, plant burns coal, coke and natural gas. The natural gas is purchased on an interruptible basis for economic reasons. On a firm or full-time basis the cost of the gas would approach the cost of purchased electrical energy and the primary use of the boilers in which these fuels are consumed is to generate electricity.

The only specification put on the coal presently being purchased for this plant is its B.t.u. content.

The plant, which was first put in service in 1951, was originally designed to burn coal. However, when economically priced gas became available in the Chicago area it was modified so that it can now burn either coal or gas. Coke is frequently available on a spot basis at attractive prices similar to the interruptible gas supply but the coke must be blended with coal or gas to burn efficiently so that it could not be used as a sole source of energy. Storage and handling costs of coal and coke are not significant and, of course, there are virtually no such costs related to gas.



Aside from the factors stated above and the fact that our contract with United Electric Coal Company calls for us to buy 50% of our fuel from them, cost is the sole factor in determining the fuel to use at any given point in time.

Very truly yours,

John R. Murphy

John R. Murphy

GOVERNMENT EXHIBIT 43

DUNDEE CEMENT COMPANY

DUNDEE MICHIGAN TELEPHONE: DETROIT · WOODWARD 3-8488,
TOLEDO · CHERRY 4-7488, ANN ARBOR · NORMANDY 2-2547, DUNDEE · LAWRENCE 9-2411

August 22, 1968

Mr. John T. Cusack
Attorney
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Dear Mr. Cusack:

Responding to your letter of August 7, 1968, I shall try to answer the questions in the order in which they were asked.

1. Enclosed please find a schedule which provides the information regarding our coal purchases for the periods requested.

2. Neither the Dundee plant nor the Clarksville plant consumed any other energy fuel for the purposes for which coal is required. In both plants we use oil in connection with the start-up of kilns, because of the lower ignition point for oil. Once the coal is ignited, the fuel oil feed is stopped. The oil usage is not significant, and in no case has it been substituted as a running fuel, the purpose for which coal has been used by us.

3. Not applicable in light of the response to question 2.

4. I am advised that we do not specifically place a ceiling on the sulphur content of the coal we buy. However, we do seek to obtain the lowest sulphur content coal available at competitive prices. Economics play the most important role. If a high sulphur coal is offered at a substantially lower cost per million BTU than lower sulphur coal, we would use the high sulphur coal, provided the measures to compensate for the high sulphur content are not such as to erase the purchase cost advantage.

60-0-37-910
DEPARTMENT OF JUSTICE
AUG 28 1968
DIVISION V ILLINOIS
acknowledged 8-30-68

The present sulphur content of the coals purchased for the Dundee plant ranges from 0.80% to 1.25% with the average in the area of 1.10%.

The present sulphur content of the coals purchased for the Clarksville plant ranges from a low of 1.50% to a high of 3.0% with the average in the area of 2.6%.

We have not set an absolute maximum on sulphur content. I believe that this particular question has not been raised in a practical way in our experience, that is to say that extremely high sulphur coals have not been offered to us at a sufficiently low price to warrant our investigating the adjustments which we could or would be willing to make.

Obviously adjustment can be made and has been made within limits to the raw mix to compensate for changes in sulphur content of the coal.

5. General knowledge of the availability and economics of the various energy fuels known to be usable in the manufacture of cement clinker have made it unnecessary to make formalized surveys or studies as to the merits of one fuel versus another. Hence our information is fragmentary. At both Dundee and Clarksville only cursory investigations were made, and it was a relatively simple matter to decide to use coal at both locations for the main running fuel. The cost of fuel has been dramatically less for coal than for natural gas or fuel oil. However, from previous experience, our chief executive was reluctant to consider using a fuel whose supply could be interrupted.

Feasibility studies for the immediate conversion from coal to gas or oil have never been made at either location. It is possible to envision circumstances in which such would be considered, for example if another were to be in abundant supply for a reasonably assured long period.

We trust that this answers all of the questions which you raised.

Very truly yours,

Boyd W. Yard

Secretary-Treasurer

BWY:jr

cc: M/O/Richard G. Ferguson

DUNDEE

DUNDEE CEMENT COMPANY
COAL PURCHASES 1967 SUMMARY
CLARKSVILLE, MISSOURI, PLANT

	Tons	Cost	Freight
Bell & Zoller - Ill.			
January-March	14,021.95	$ 55,386.73	$20,331.84
April-June	5,103.05	20,918.14	7,400.14
July-December	21,690.00	92,484.72	31,553.60
Total	40,815.00	$168,789.59	$59,285.58
Peabody - Ill.			
January-March	4,349.80	$ 17,181.72	$ 6,307.22
April-June	11,789.55	48,107.19	17,094.84
July-December	55,272.30	234,605.38	80,339.67
Total	71,411.65	$299,894.29	$103,741.73
Old Ben - Ill.			
January-March	11,443.75	$ 45,140.07	$ 16,593.44
April-June	7,909.05	31,617.26	11,468.13
July-December	24,403.05	95,171.95	35,384.45
Total	43,755.85	$171,929.28	$ 63,446.02
GRAND TOTAL	155,982.50	$640,613.16	$226,473.33

GOVERNMENT EXHIBIT 49

FEDERAL POWER COMMISSION

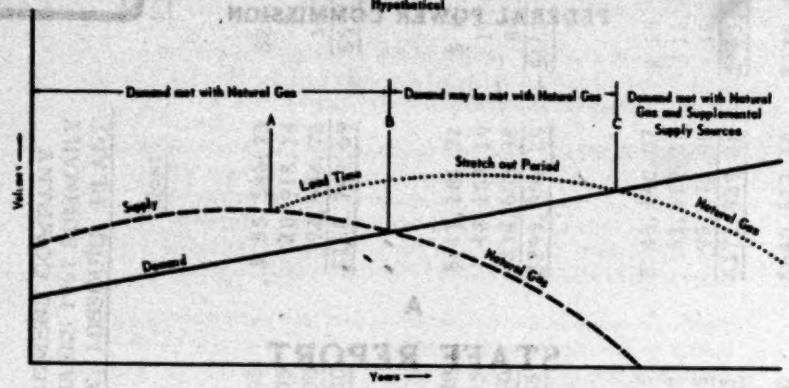
A STAFF REPORT ON NATIONAL GAS SUPPLY AND DEMAND

BUREAU OF NATURAL GAS
Washington, D.C.
September 1969

* * *

Figure 1

GAS SUPPLY – DEMAND BALANCE
Hypothetical



INTRODUCTION

Evidence is mounting that the supply of natural gas is diminishing to critical levels in relation to demand. There is a compelling need for accurate and current analysis and interpretation of this trend. Prior studies of future natural gas availability have proven to be overly optimistic. The purpose of this report is to provide a realistic and objective outlook on the natural gas supply-demand relationship as a guide to effective regulatory and management decisions.

On the basis of current trends, only a few years remain before demand will outrun supply. During this period decisions of increasing urgency will confront industry and government policy makers with respect to gas prices, market expansions, exports and imports, and substitute fuel technology and availability. Timely action can extend the usefulness of the natural gas resource base and ease the inevitable transition to a gas economy in which imported and substitute gas fuels will play an increasingly important role. Figure 1, a hypothetical gas supply-demand balance case, is illustrative of the timing problem and the value of purposeful planning for future gas supply. The dashed supply line represents a continuation of present trends. The dotted supply line represents a program which would optimize the usefulness of our remaining natural gas resources and provide the needed additional time for economic and technological developments to furnish the required volumes of substitute fuels at reasonable costs.

GX 51

COAL SHIPMENTS TO ILLINOIS DESTINATIONS
BY DISTRICT OF ORIGIN
1965-1967

Year	Coal Shipments to Illinois Destinations	District of Origin					
		3 and 6 Northern West Va. and West Va. Panhandle	4 Ohio	7 and 8 Southern West Va. and Northern Va.	9 West Kentucky	10 Illinois	11 Indiana
1965	44,356,000 */	154,000	15,000	1,033,000	3,386,000	4,206,000	34,147,000	1,415,000
1966	46,382,000	63,000	13,000	1,027,000	3,190,000	3,384,000	37,573,000	1,132,000
1967	46,710,000	167,000	12,000	822,000	2,961,000	3,150,000	38,510,000	1,088,000

*/ Net Tons

Source: Mineral Industry Surveys, U. S. Department of the Interior, Bureau of Mines--Bituminous Coal and Lignite Distribution Report, Calendar Years 1965-1967 (Gallagher Deposition Exhibits 1-3).

GOVERNMENT EXHIBIT 32

Revised

1967 SALES OF COAL IN THE EASTERN INTERIOR COAL PROVINCE SALES AREA BY COAL PRODUCERS LOCATED IN ILLINOIS (PRODUCING DISTRICT NO. 10), INDIANA (PRODUCING DISTRICT NO. 11), AND WESTERN KENTUCKY (PRODUCING DISTRICT NO. 9)

Name of Producer	Within Sales Area		Outside Sales Area		Unknown */		Total Tons
	Tons	% of Total	Tons	% of Total	Tons	% of Total	
Ayrshire Collieries Corporation							
Thunderbird Mine	985,542.00	100.0	--	--	--	--	985,542.00
Wright Mine	1,300,986.00	100.0	--	--	--	--	1,300,986.00
Hancock Mine	1,084,244.00	93.6	73,375.00	6.3	1,171.00	.1	1,158,790.00
Minnehaha Mine	1,618,044.00	93.3	102,704.00	6.0	13,224.00	.7	1,733,972.00
Harmattan Mine	546,213.00	96.5	--	--	19,803.00	3.5	566,016.00
Sun Spot Mine	774,069.00	96.5	8,007.00	1.0	19,832.00	2.5	801,908.00
Delta Mine	586,060.00	59.0	360,303.00	36.2	47,322.00	4.8	993,685.00
Gibraltar Mine (1/2)	1,036,779.00	100.0	--	--	--	--	1,036,779.00
Total	7,931,937.00	92.5	544,389.00	6.3	101,352.00	1.2	8,577,678.00
Barbara Kay Coal, Inc.							
Barbara Kay Mine	111,741.00	100.0	--	--	--	--	111,741.00
Belle Valley Coal Company, Inc.							
Belle Valley Mine	107,091.00	100.0	--	--	--	--	107,091.00
Black Tam Mining Company							
Black Tam Mine	--	--	1,210,244.85	100.0	--	--	1,210,244.85
Freeman Coal Mining Corporation							
Crown Mine	2,190,278.00	100.0	--	--	--	--	2,190,278.00
Orient #3 Mine	2,350,317.00	89.2	284,168.00	10.8	--	--	2,634,485.00
Orient #4 Mine	1,091,347.00	84.3	203,075.00	15.7	--	--	1,294,422.00
Orient #5 Mine	1,448,872.00	98.8	17,267.00	1.2	--	--	1,466,139.00
Total	7,080,814.00	93.3	504,510.00	6.7	--	--	7,585,324.00

Name of Producer	Within Sales Area		Outside Sales Area		Unknown */		Total Tons
	Tons	% of Total	Tons	% of Total	Tons	% of Total	
Houston Coal Co.							
Houston Mine	14,615.41	100.0	--	--	--	--	14,615.41
Island Creek Coal Company, West Kentucky Division							
East Diamond Mine	110,247.00	4.6	2,262,975.00	95.4	--	--	2,373,222.00
Pleasant View Mine	360,127.00	63.9	204,374.00	36.1	--	--	566,501.00
Atkinson Mine	1,441,719.00	98.1	28,428.00	1.9	--	--	1,470,147.00
Pies Mine	1,153,696.00	80.3	273,409.00	19.0	9,591.00	.7	1,436,696.00
Crescent Mine	820,872.00	78.2	201,323.00	19.2	27,087.00	2.6	1,049,282.00
Williams Mine	224,188.00	89.8	14,732.00	5.9	10,844.00	4.3	249,764.00
Uniontown Mine	629,106.00	42.9	837,934.00	57.1	--	--	1,467,040.00
Boone Mine	--	--	419,685.00	100.0	--	--	419,685.00
Total	4,741,955.00	52.5	4,242,860.00	47.0	47,522.00	.5	9,032,337.00
Kirkpatrick Mining Company							
Kirkpatrick Mine	698,674.56	94.2	43,000.50	5.8	--	--	741,675.06
Old Ben Coal Corporation							
Mine #24	2,358,747.00	99.6	8,786.00	.4	--	--	2,367,533.00
Mine #21	1,999,409.00	92.3	166,857.00	7.7	--	--	2,166,266.00
Mine #9	1,160,081.00	95.8	51,390.00	4.2	--	--	1,211,471.00
Enoe Mine	1,311,190.00	86.6	203,675.00	13.4	--	--	1,514,865.00
Blackfoot #5 Mine	1,084,831.00	86.5	169,909.00	13.5	--	--	1,254,740.00
King's Station Mine	196,048.00	90.3	21,094.00	9.7	--	--	217,142.00
Total	8,110,306.00	92.9	621,711.00	7.1	--	--	8,732,017.00
The Pittsburg & Midway Coal Mining Co.							
Colonial Mine	1,495,809.00	74.0	504,924.00	25.0	21,472.00	1.0	2,022,205.00
Paradise Mine	1,803,558.00	86.2	211,792.00	10.1	77,475.00	3.7	2,092,825.00
DeKoven Mine	2,082,702.00	70.92	853,726.00	29.07	326.00	.01	2,936,754.00
Total	5,382,069.00	76.3	1,570,442.00	22.3	99,273.00	1.4	7,051,784.00

Name of Producer	Within Sales Area		Outside Sales Area		Unknown */		Total Tons
	Tons	% of Total	Tons	% of Total	Tons	% of Total	
Peabody Coal Company							
Northern Illinois Mine	754,530.46	100.0	--	--	39.69	--	754,570.15
River King Mine	5,277,234.91	99.3	24,261.85	.4	15,532.88	.3	5,317,029.64
Forsyth-Energy Mine	479,042.97	94.8	26,167.95	5.2	4.98	--	505,215.90
Midwest Mine	1,414,631.91	100.0	--	--	--	--	1,414,631.91
Mine #10	5,720,947.05	99.99	328.90	.01	--	--	5,721,275.95
Sinclair Mine	4,825,456.00	100.0	--	--	--	--	4,825,456.00
River Queen Mine	2,105,457.83	39.4	3,236,739.85	60.6	220.38	--	5,342,418.06
Ken Mine	878,710.45	31.1	1,931,998.95	68.4	14,956.55	.5	2,825,861.95
Homestead Mine	1,931,964.58	82.1	421,091.65	17.9	--	--	2,353,056.23
ague Mine	2,217,415.37	81.8	334,807.61	12.4	158,187.51	5.8	2,710,410.49
Riverview Mine	916,718.76	87.1	134,125.40	12.8	1,032.76	.1	1,051,876.92
Will Scarlet Mine	1,152,061.50	83.4	227,263.28	16.5	1,707.12	.1	1,381,031.90
Allendale Mine	247,974.34	100.0	--	--	--	--	247,974.34
Utility Mine	503,555.45	97.3	13,726.55	2.6	334.06	.1	517,616.06
Edwards Mine	536,246.46	99.97	--	--	149.75	.03	536,396.21
Lynnville Mine	2,846,661.94	84.1	535,914.50	15.8	3,071.28	.1	3,385,647.72
Squaw Creek Coal Co.	1,436,358.00	100.0	--	--	--	--	1,436,358.00
Victoria Mine	895,971.59	100.0	--	--	--	--	895,971.59
Macco Mine	1,245,903.31	99.84	1,864.90	.15	63.73	.01	1,247,831.94
Chieftain Mine	475,378.84	99.99	--	--	57.25	.01	475,436.09
Old Glory Mine	592,385.82	98.68	7,506.85	1.25	397.65	.07	600,290.32
Middle Grove Mine	1,381,608.16	99.98	147.20	.01	194.15	.01	1,381,943.51
Bright Star Mine	545,481.76	99.62	1,937.85	.35	168.83	.03	547,588.44
Green Diamond Mine	94.00	100.0	--	--	--	--	94.00
Eagle Mine	225,964.24	73.1	82,960.23	26.9	--	--	308,924.47
Hawthorn Mine	2,331,393.62	96.0	96,480.60	3.97	691.80	.03	2,428,566.02
Gibraltar Mine (1/2)	761,185.15	73.1	279,486.98	26.9	--	--	1,040,672.13
Total	41,700,288.47	84.7	7,356,805.10	14.9	196,468.37	.4	49,253,561.94
Rialto Coal Mining Company, Inc.							
Jiffy Mine	223,038.43	49.2	--	--	229,839.80	50.8	452,878.23

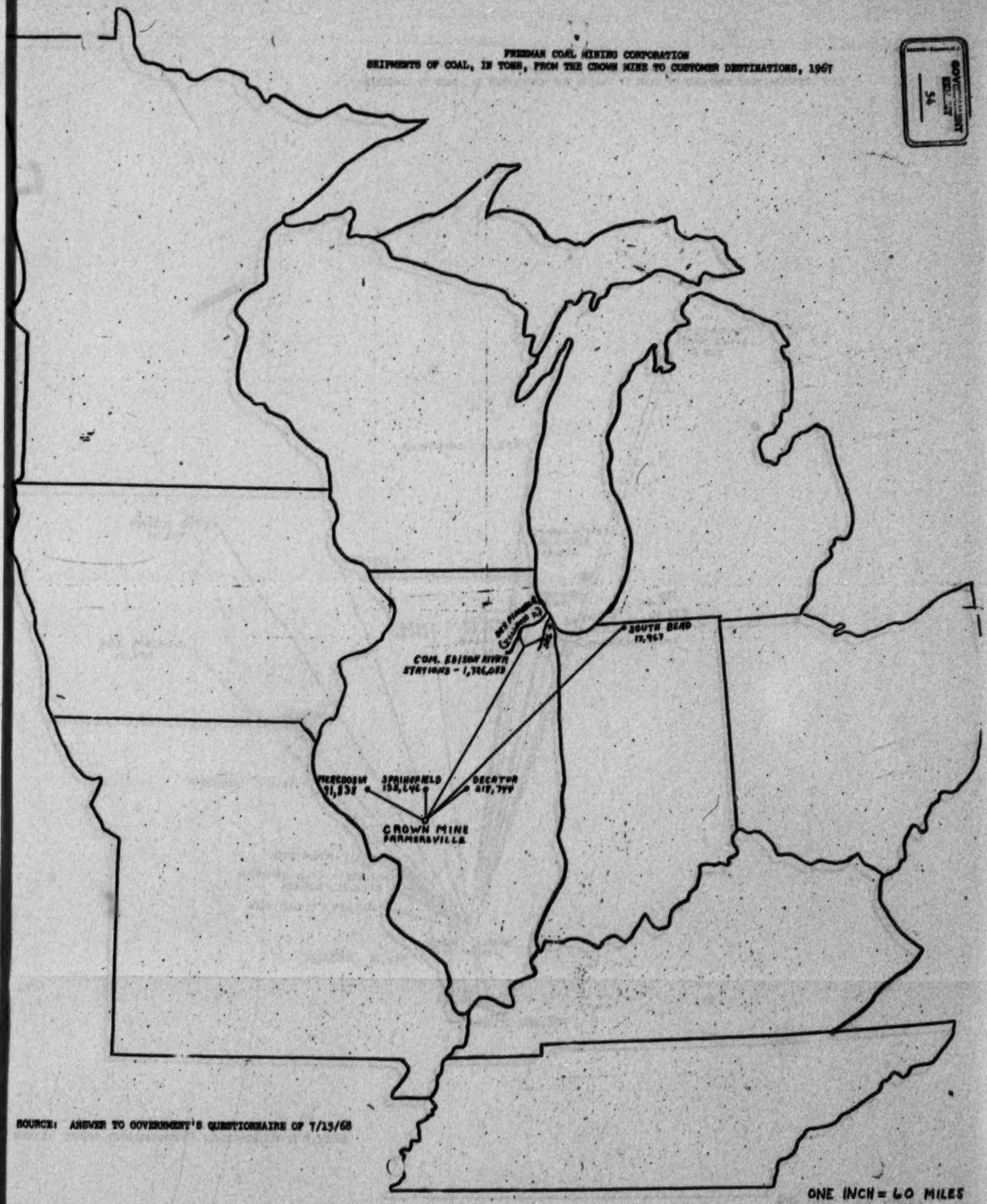
Name of Producer	Within Sales Area		Outside Sales Area		Unknown */		Total Tons
	Tons	% of Total	Tons	% of Total	Tons	% of Total	
Sahara Coal Co., Inc.							
Mines 5, 6 and 16	2,171,491.00	85.3	375,102.00	14.7	—	—	2,546,593.00
Sherwood-Templeton Coal Company, Inc.							
Pioneer Mine	87,076.00	74.1	—	—	30,431.00	25.9	117,507.00
Southwestern Illinois Coal Corporation							
Captain Mine	5,787,105.59	100.0	—	—	—	—	5,787,105.59
Streamline Mine	1,625,769.23	94.7	3,935.40	.2	86,493.15	5.1	1,716,197.80
Total	7,412,874.84	98.8	3,935.40	.1	86,493.15	1.1	7,503,303.39
Tab-Badgett, Joint Venture							
Lakeview Mine	—	—	9,094.90	1.6	557,417.70	98.4	566,512.60
Truax-Traer Coal Company							
Burning Star #2 Mine	953,123.87	63.6	15,388.55	1.0	531,027.65	35.4	1,499,540.07
Piatt Mine	1,521,765.88	99.95	—	—	740.60	.05	1,522,506.40
Little Sister Mine	915,137.20	99.69	—	—	2,801.62	.31	917,938.82
Burning Star #3 Mine	108,775.20	6.46	—	—	1,574,442.25	93.54	1,683,217.45
Hillsboro Mine	1,169,007.00	100.0	—	—	—	—	1,169,007.00
Total	4,667,809.07	68.7	15,388.55	.2	2,109,012.12	31.1	6,792,209.74
The United Electric Coal Companies							
Banner Mine	806,179.00	100.0	—	—	—	—	806,179.00
Fidelity Mine	1,657,395.00	92.6	131,700.00	7.4	—	—	1,789,095.00
Cube-Buckheart Mines	2,782,232.00	100.0	—	—	—	—	2,782,232.00
Total	5,245,806.00	97.6	131,700.00	2.4	—	—	5,377,506.00
Wright Coal Company							
Wright Mine	54,894.40	11.9	407,636.00	88.1	—	—	462,530.40

Name of Producer	Within Sales Area		Outside Sales Area		Unknown */		Total Tons
	Tons	% of Total	Tons	% of Total	Tons	% of Total	
Zeigler Coal & Coke Co.							
Spartan Mine	518,383.00	60.1	217,465.00	25.2	126,834.00	14.7	862,682.00
Zeigler #4 Mine	975,222.00	85.0	79,918.00	7.0	91,647.00	8.0	1,146,787.00
Zeigler #9 Mine	64,868.00	12.2	468,109.00	87.8	---	---	532,977.00
Oriole Mine	447,905.00	75.2	104,449.00	17.5	43,142.00	7.3	595,496.00
Murdock Mine	704,988.00	97.0	---	---	21,964.00	3.0	726,952.00
Total	2,711,366.00	70.2	869,941.00	22.5	283,587.00	7.3	3,864,894.00
GRAND TOTAL	98,453,867.18	82.0	17,906,760.30	14.9	3,741,336.14	3.1	120,101,963.62

*/ The destination of some shipments is unknown for various reasons: the questionnaire showed the destination as unknown; a lumped figure was given on the questionnaire which included shipments to destinations both within and outside the sales area but no breakdown as to specific destination; the destination shown on the questionnaire could not be geographically located; etc.

Source: Answers to Government's questionnaire of July 15, 1968.

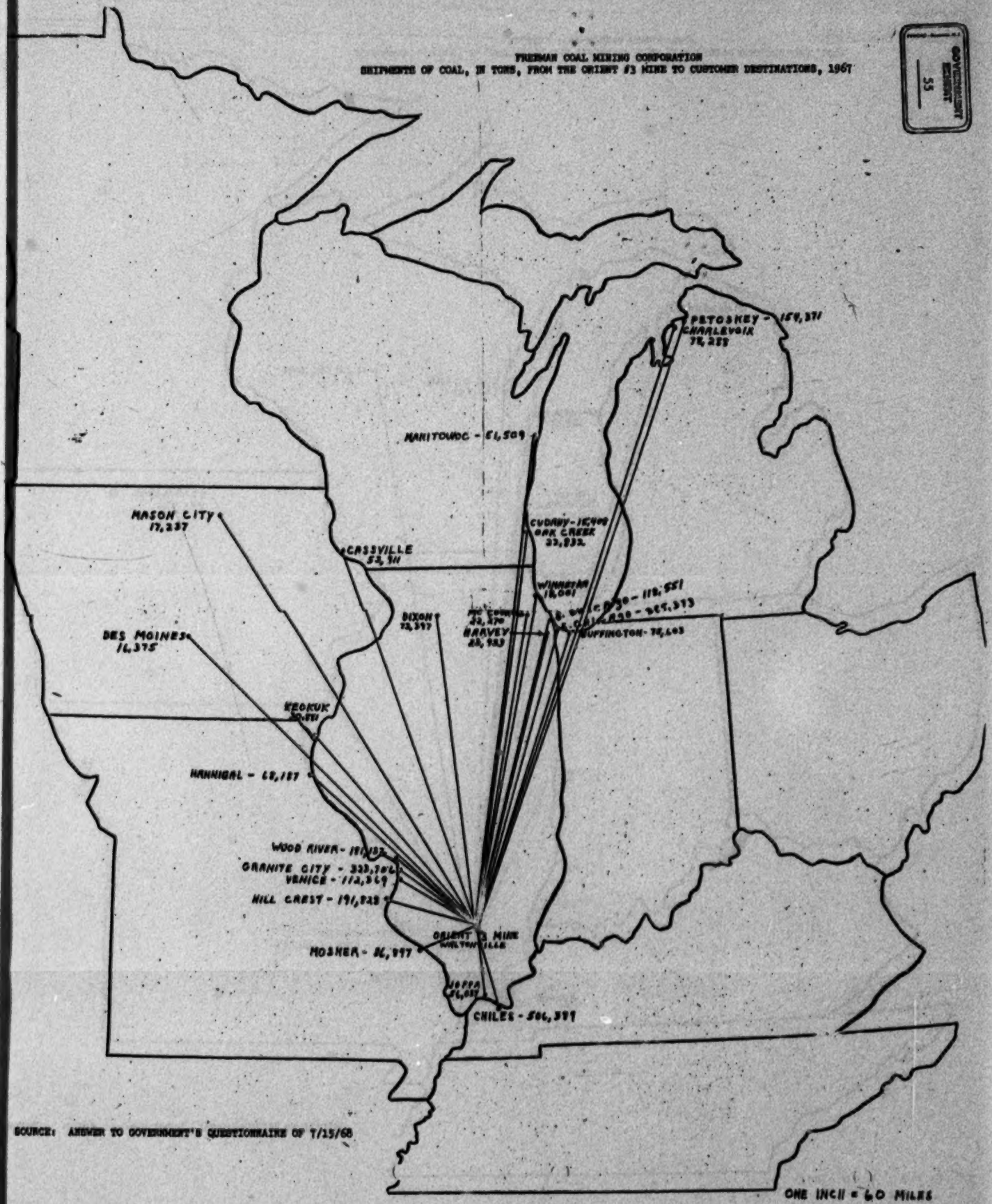
FREEMAN COAL MINING CORPORATION
SHIPMENTS OF COAL, IN TONS, FROM THE CROWN MINE TO CUSTOMER DESTINATIONS, 1967



SOURCE: ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68

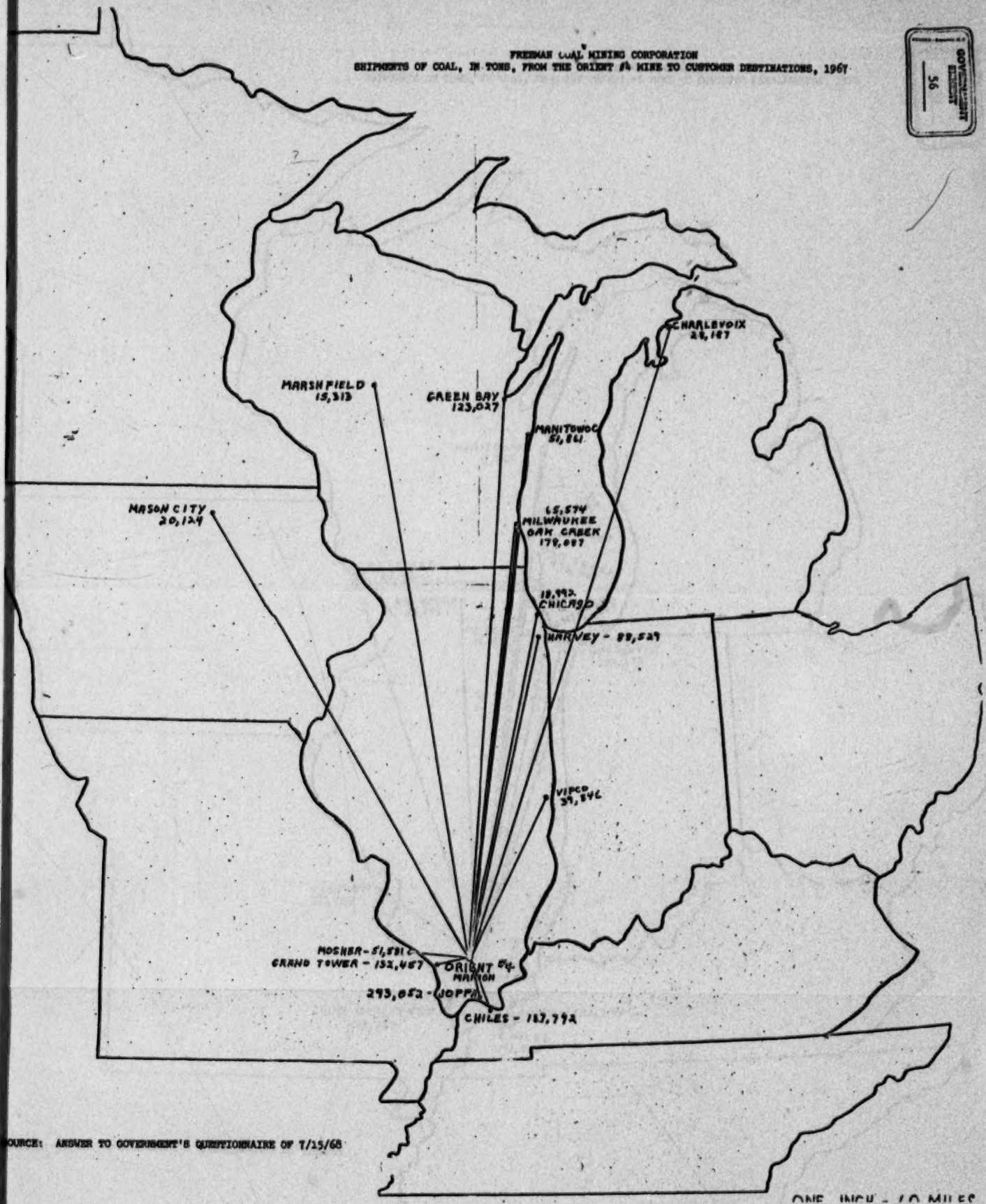
ONE INCH = 60 MILES

FREEMAN COAL MINING CORPORATION
SHIPMENTS OF COAL, IN TONS, FROM THE ORIENT #3 MINE TO CUSTOMER DESTINATIONS, 1967



SOURCE: ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68

FREEMAN COAL MINING CORPORATION
SHIPMENTS OF COAL, IN TONS, FROM THE ORIENT #4 MINE TO CUSTOMER DESTINATIONS, 1967

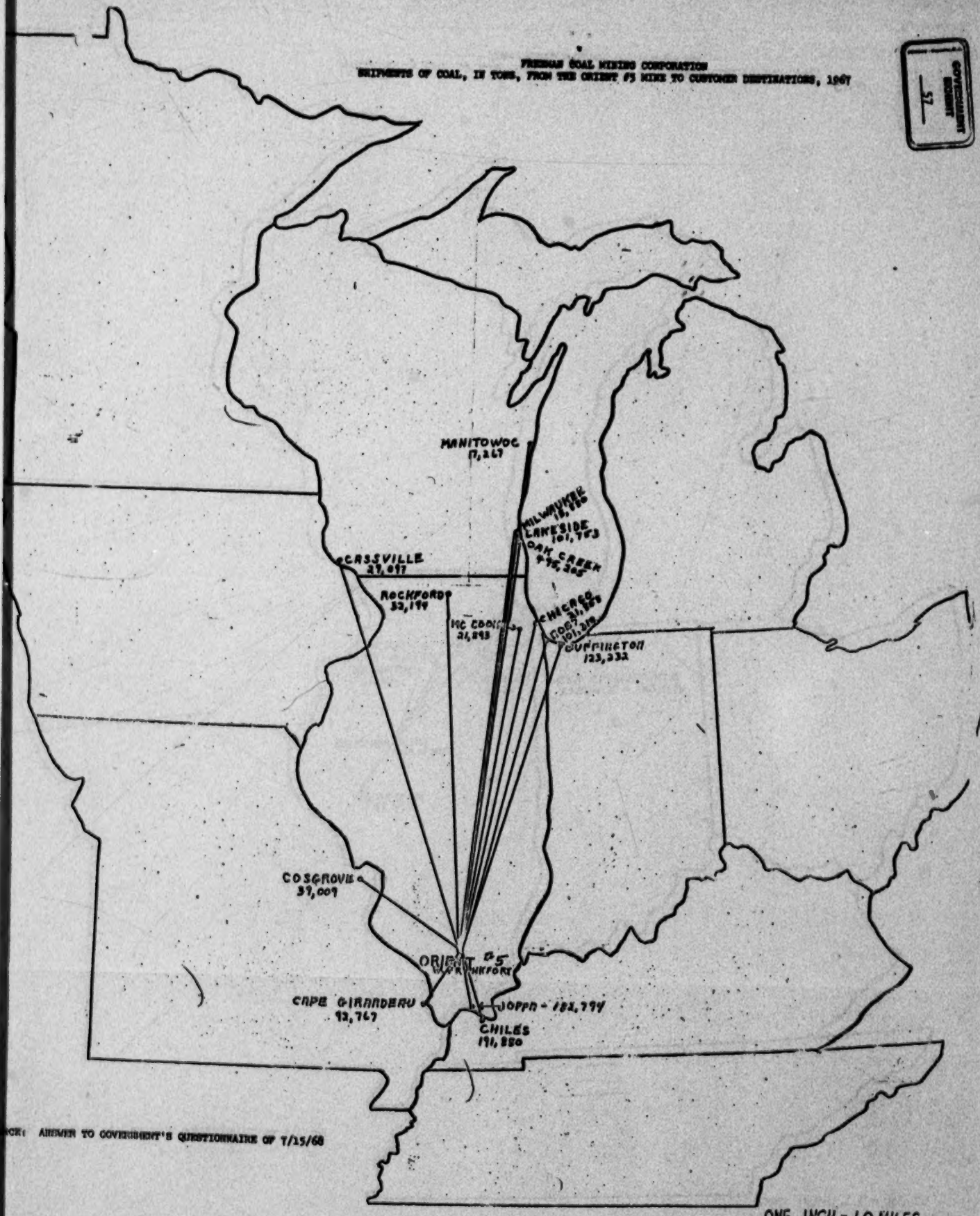


SOURCE: ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68

ONE INCH = 40 MILES

FREEMAN COAL MINING CORPORATION
SHIPMENTS OF COAL, IN TONS, FROM THE ORIENT #5 MINE TO CUSTOMER DESTINATIONS, 1967

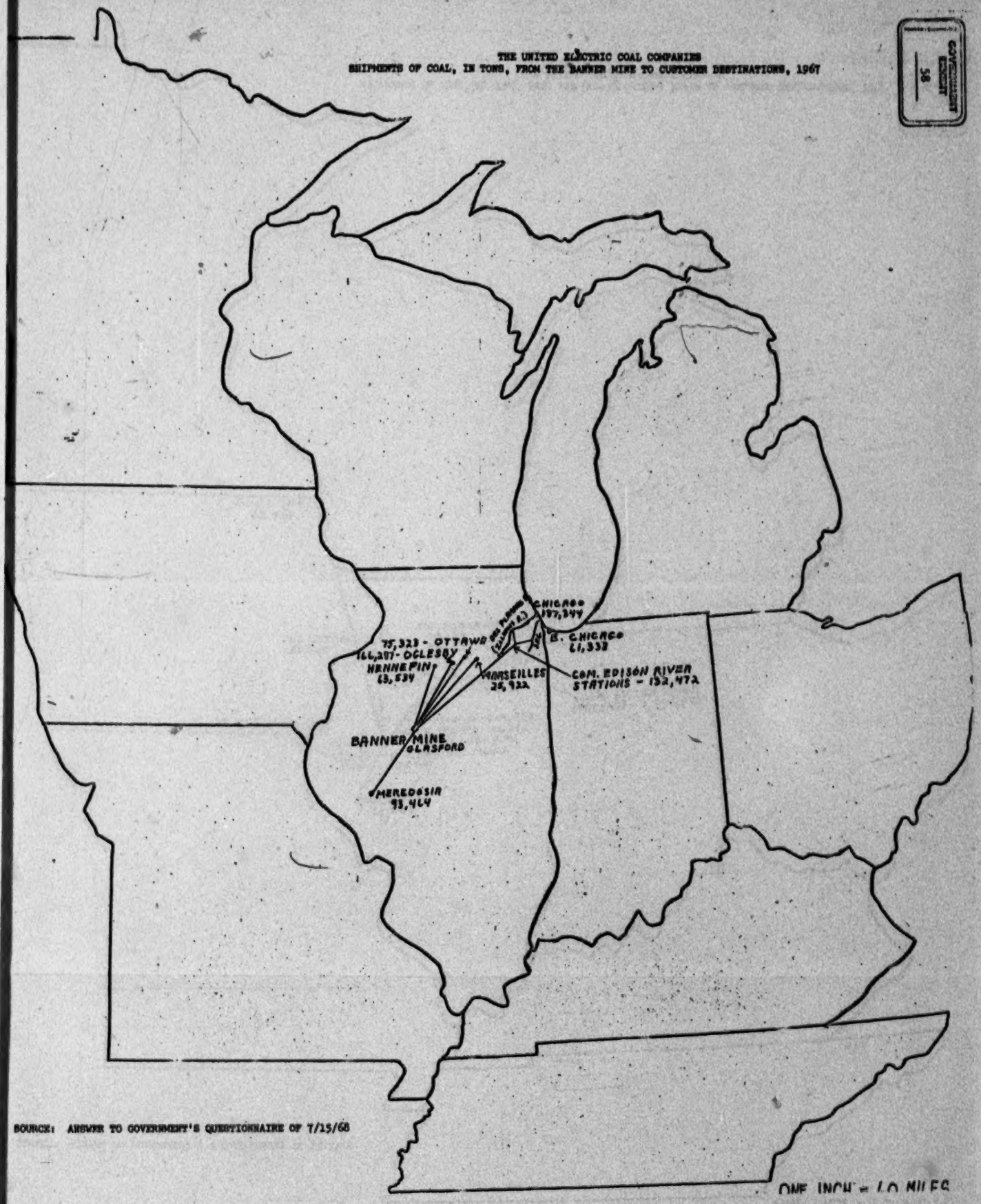
GOVERNMENT EXHIBIT 57



ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68

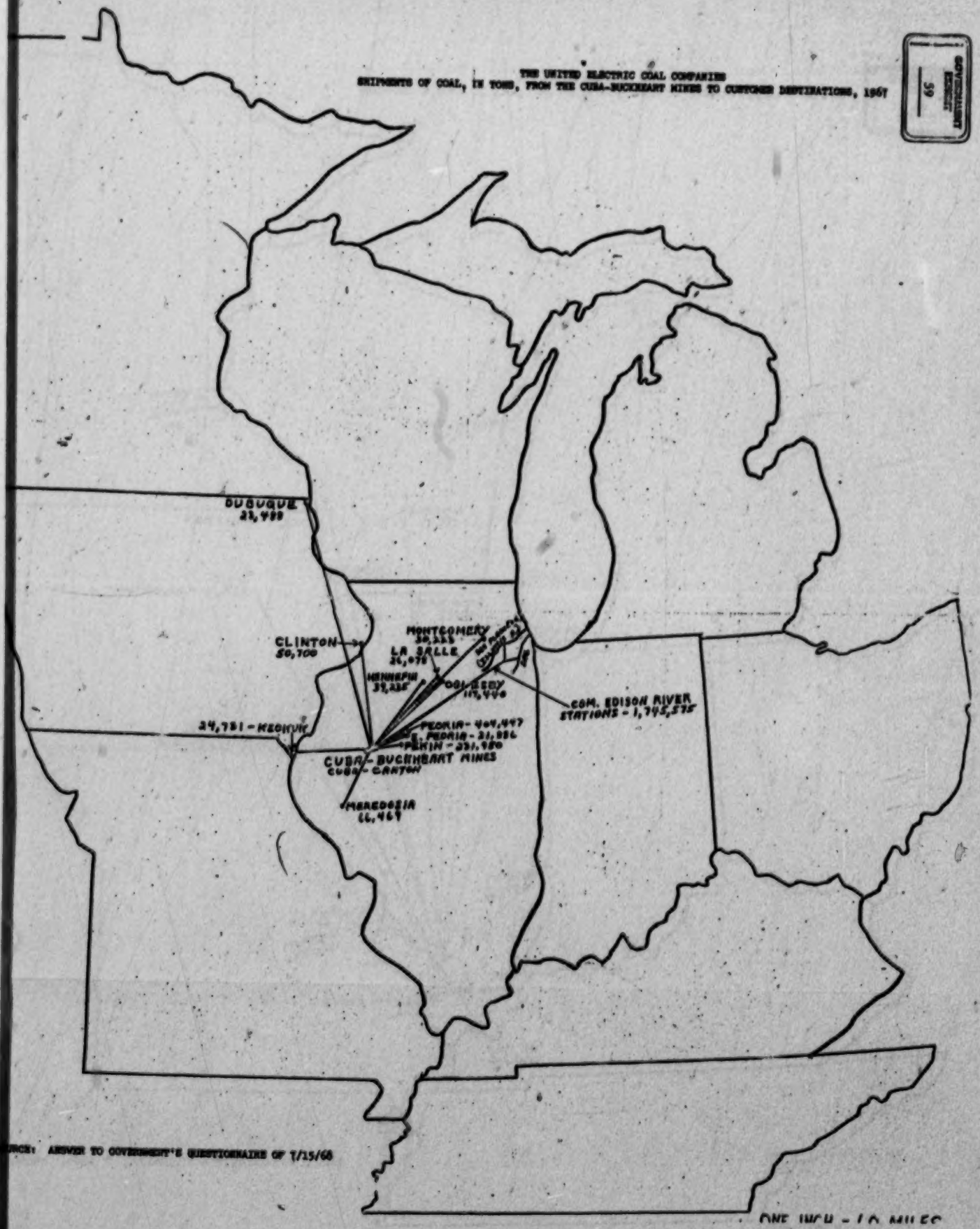
GOVERNMENT EXHIBIT 58

THE UNITED ELECTRIC COAL COMPANIES
SHIPMENTS OF COAL, IN TONS, FROM THE BANNER MINE TO CUSTOMER DESTINATIONS, 1967



SOURCE: ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68

THE UNITED ELECTRIC COAL COMPANIES
SHIPMENTS OF COAL, IN TONS, FROM THE CUBA-BUCKHEART MINES TO CUSTOMER DESTINATIONS, 1967



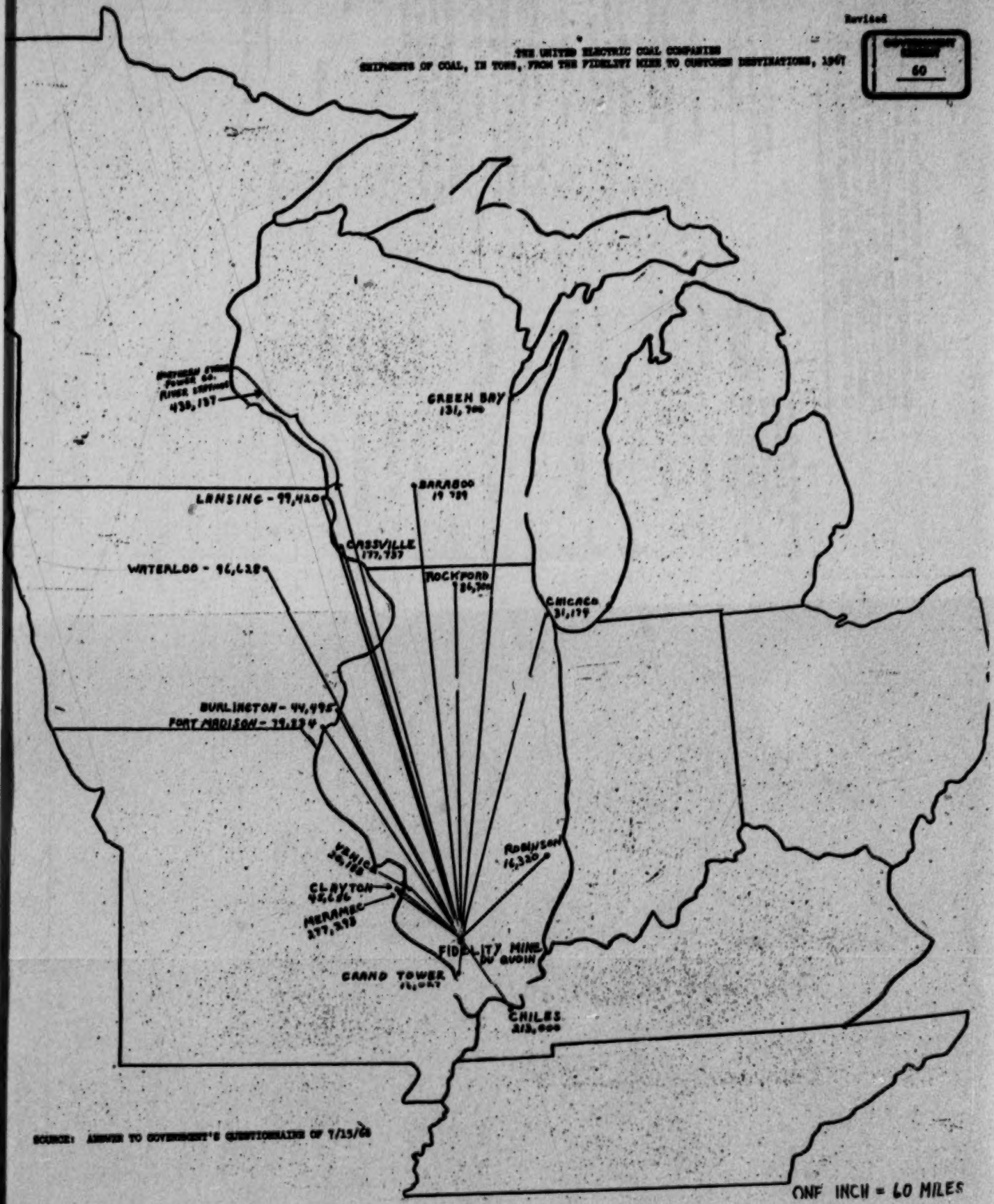
SOURCE: ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68

ONE INCH = 10 MILES

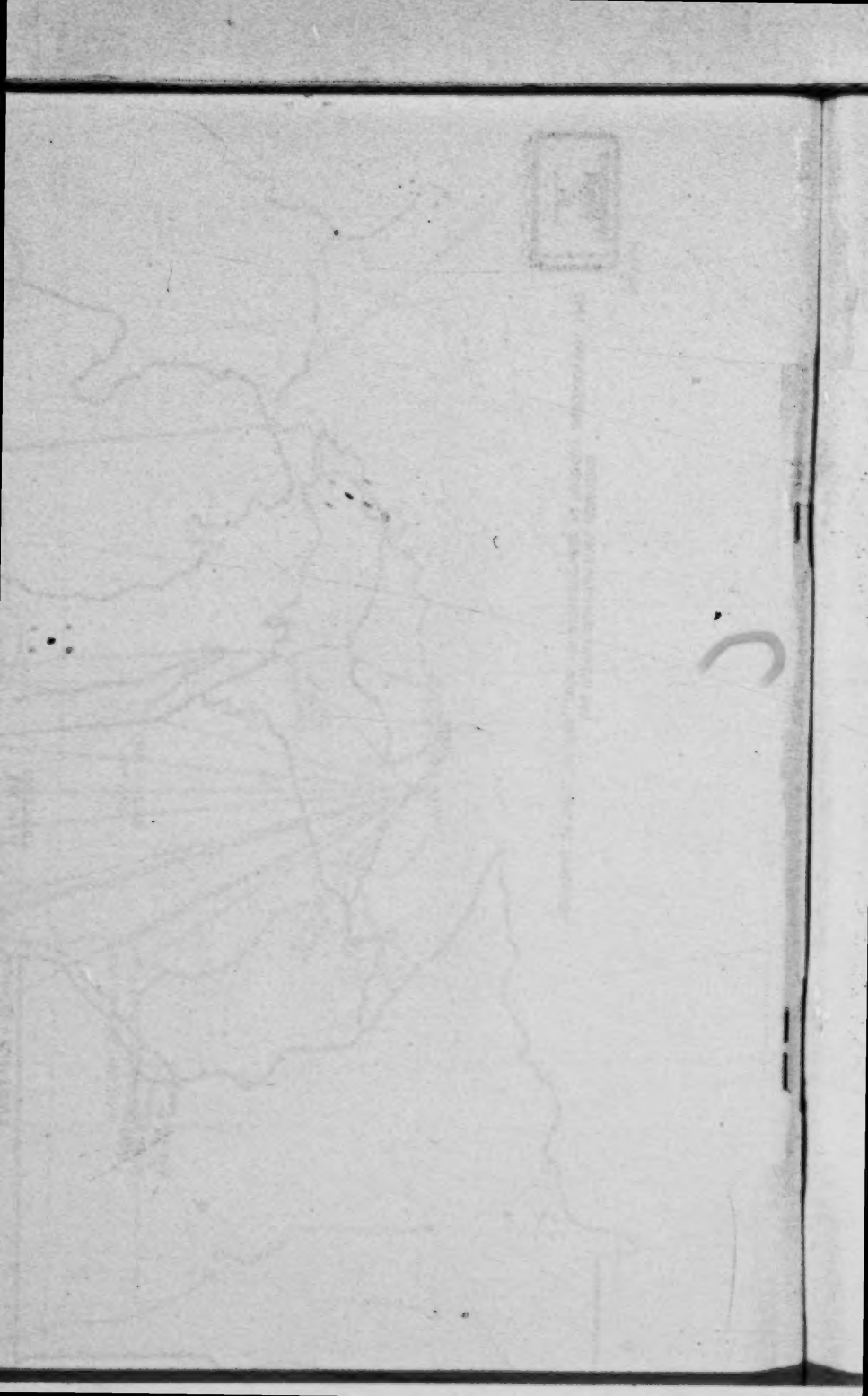
Revised

GOVERNMENT EXHIBIT 60

THE UNITED ELECTRIC COAL COMPANIES
SHIPMENTS OF COAL, IN TONS, FROM THE FIDELITY MINE TO CUSTOMER DESTINATIONS, 1967



SOURCE: ANSWER TO GOVERNMENT'S QUESTIONNAIRE OF 7/15/68



GX 61

TOTAL COAL CONSUMPTION IN TONS IN 1967 BY STEAM ELECTRIC PLANTS IN THE EASTERN INTERIOR COAL PROVINCE SALES AREA AND THE TOTAL SALES OF COAL IN TONS IN 1967 FROM MINES LOCATED IN THE EASTERN INTERIOR COAL PROVINCE TO STEAM ELECTRIC PLANTS IN THE EASTERN INTERIOR COAL PROVINCE SALES AREA

States and Portions of States Comprising the Eastern Interior Coal Province Sales Area	1 Total Coal Consumption (In Tons)	2 Coal Sales From Mines Located Within the Eastern Interior Coal Province (In Tons)
Western one half of Kentucky	10,649,000	12,051,000
Western one-third to one half of the State of Tennessee	6,050,000	5,210,000
The Extreme Eastern Portion of the State of Missouri on or Near the Mississippi River	3,042,000	3,491,000
Eastern one half of Iowa	2,167,200	2,042,000
Southeastern Minnesota, defined as Principally the Cities of St. Paul and Minneapolis and the Southeastern one-quarter of the State Contiguous to the Mississippi River	2,298,000	2,092,242
Wisconsin, Except for that Portion Contiguous to Lake Superior and that Portion Contiguous to Lake Michigan above Milwaukee	5,689,000	5,699,000
Indiana	19,120,000	18,697,000
Illinois	28,295,000	28,324,000
TOTAL	77,310,200	77,606,242

See Sources on page 2.

Agreed to by Defendants
Not agreed to by Plaintiff

GOVERNMENT EXHIBIT 62

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES 1/ FOR THE 1957 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	10,736,481	1	23.0
Material Service Corporation	6,905,475	2	14.8
Freeman Coal Mining Corporation	5,832,717		(12.5)
Chicago, Wilmington & Franklin Coal Co. 2/	1,072,758		(2.3)
Truax-Traer Coal Company	4,170,363	3	8.9
The United Electric Coal Companies	3,619,243	4	7.7
Old Ben Coal Corporation	3,519,263	5	7.5
Zeigler Coal & Coke Co.	2,747,035	6	5.9
Ayrshire Collieries Corporation	2,410,301	7	5.2
Midland Electric Coal Corporation	2,367,206	8	5.0
Sahara Coal Co., Inc.	1,589,354	9	3.4
Union Colliery Co.	1,156,065	10	2.5
Stonefort Corporation	1,144,394	11	2.5
Southwestern Illinois Coal Corporation	812,911	12	1.7
Mid-Continent Coal Corporation	727,399	13	1.6
Lumaghi Coal Company	572,559	14	1.2
Saxton Coal Corporation	547,280	15	1.2
Morgan Coal Company	407,297	16	.9
Little Old Dog Coal Company	360,708	17	.8
127 remaining companies	2,889,555		6.2
TOTAL 1957 Production of Coal in Illinois	46,682,889		100.0

1/ Production in excess of 300,000 tons.

2/ See Deposition Transcript of Frank M. Nugent, p. 62.

Coal Report of Illinois, 1957, Department of Mines and Minerals.

Agreed to by Defendants
Not agreed to by Plaintiff

GOVERNMENT EXHIBIT 63

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES 1/ FOR THE 1958 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	8,714,059	1	19.9
Material Service Corporation	6,872,541	2	15.6
Freeman Coal Mining Corporation	5,801,164		(13.2)
Chicago, Wilmington & Franklin Coal Co. 2/	1,071,377		(2.4)
Truax-Traer Coal Company	4,346,474	3	9.9
Old Ben Coal Corporation	3,580,078	4	8.2
..ne United Electric Coal Companies	3,334,478	5	7.6
Zeigler Coal & Coke Co.	3,076,732	6	7.0
Ayrshire Collieries Corporation	2,343,786	7	5.4
Midland Electric Coal Corporation	2,340,470	8	5.3
Sahara Coal Co., Inc.	1,565,160	9	3.6
Stonefort Corporation	1,088,982	10	2.5
Southwestern Illinois Coal Corporation	956,347	11	2.2
Mid-Continent Coal Corporation	823,966	12	1.9
Saxton Coal Corporation	637,241	13	1.5
Union Colliery Co.	577,331	14	1.3
Morgan Coal Company	573,231	15	1.3
Lumaghi Coal Company	521,364	16	1.2
ttle Dog Coal Company	375,594	17	.9
116 remaining companies	2,049,296		4.7
TOTAL 1958 Production of Coal in Illinois	43,777,130		100.0

1/ Production in excess of 300,000 tons.

2/ See Deposition Transcript of Frank M. Nugent, p. 62.

Not agreed to by Plaint

GOVERNME
EXHIBIT
64

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES 1/ FOR THE 1959 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	9,588,461	1	21.1
Material Service Corporation	6,858,695	2	15.1
Freeman Coal Mining Corporation	6,006,089		(13.2)
Chicago, Wilmington & Franklin Coal Co. 2/	348,550		(.8)
Orient No. 2 Coal Company 2/	504,056		(1.1)
Truax-Traer Coal Company	4,764,481	3	10.5
Old Ben Coal Corporation	3,757,366	4	8.3
The United Electric Coal Companies	3,661,202	5	8.1
Zeigler Coal & Coke Co.	3,275,091	6	7.2
Midland Electric Coal Corporation	2,482,668	7	5.5
Ayrshire Collieries Corporation	2,393,451	8	5.3
Sahara Coal Co., Inc.	1,637,451	9	3.6
Southwestern Illinois Coal Corporation	1,138,132	10	2.5
Stonefort Corporation	941,807	11	2.1
Mid-Continent Coal Corporation	917,139	12	2.0
Morgan Coal Company	669,672	13	1.5
Saxton Coal Corporation	564,289	14	1.2
Lumaghi Coal Company	505,458	15	1.1
Little Dog Coal Company	327,830	16	.7
106 remaining companies	1,891,433		4.2
TOTAL 1959 Production of Coal in Illinois	45,374,626		100.0

1/ Production in excess of 300,000 tons.

2/ See Deposition Transcript of Frank M. Nugent, p. 62.

Source: Coal Report of Illinois, 1959, Department of Mines and Minerals, State of Illinois, Table 10, pages 34-54.

GX 65

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES 1/ FOR THE 1960 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	9,418,967	1	20.5
General Dynamics Corporation	6,833,842	2	14.9
Freeman Coal Mining Corporation	6,234,128		(13.6)
Orient No. 2 Coal Company	599,714		(1.3)
Truax-Traer Coal Company	4,927,195	3	10.8
The United Electric Coal Companies	4,231,072	4	9.2
Old Ben Coal Corporation	3,512,214	5	7.7
Zeigler Coal & Coke Co.	3,429,094	6	7.5
Midland Electric Coal Corporation	2,557,304	7	5.6
Ayrshire Collieries Corporation	2,165,026	8	4.7
Sahara Coal Co., Inc.	1,722,557	9	3.8
Mid-Continent Coal Corporation	936,468	10	2.0
Southwestern Illinois Coal Corporation	933,759	11	2.0
Stonefort Coal Mining Co., Inc.	882,755	12	1.9
Saxton Coal Corporation	711,733	13	1.6
Morgan Coal Company	668,019	14	1.5
Lumaghi Coal Company	563,963	15	1.2
Little Dog Coal Company	358,171	16	.8
82 remaining companies	1,968,493		4.3
TOTAL 1960 Production of Coal in Illinois	45,820,632		100.0

1/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1960, Department of Mines and Minerals, State of Illinois, Table 10, pages 34-55.

GX 66

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES */ FOR THE 1961 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	9,732,236	1	21.6
Freeman Coal Mining Corporation, subsidiary of General Dynamics Corporation	6,610,361	2	14.6
Truax-Traer Coal Company	4,454,663	3	9.9
The United Electric Coal Companies	4,420,690	4	9.8
Old Ben Coal Corporation	3,453,795	5	7.7
Zeigler Coal & Coke Co.	3,390,770	6	7.5
Midland Electric Coal Corporation	2,367,667	7	5.2
Ayrshire Collieries Corporation	2,270,004	8	5.0
Sahara Coal Co., Inc.	1,769,638	9	3.9
Southwestern Illinois Coal Corporation	939,455	10	2.1
Stonefort Coal Mining Co., Inc.	909,769	11	2.0
Mid-Continent Coal Corporation	822,111	12	1.8
Saxton Coal Corporation	700,002	13	1.6
Morgan Coal Company	556,207	14	1.2
Lumaghi Coal Company	536,071	15	1.2
Little Dog Coal Company	312,192	16	.7
77 remaining companies	1,886,895		4.2
TOTAL 1961 Production of Coal in Illinois	45,132,526		100.0

*/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1961, Department of Mines and Minerals, State of Illinois, Table 10, pages 34-53.

GX 67

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES */ FOR THE 1962 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	10,495,479	1	21.7
Freeman Coal Mining Corporation, subsidiary of General Dynamics Corporation	6,841,632	2	14.1
Consolidation Coal Co., Truax-Traer Division	5,021,377	3	10.4
The United Electric Coal Companies	4,846,926	4	10.0
Old Ben Coal Corporation	3,804,213	5	7.9
Zeigler Coal & Coke Co.	3,435,225	6	7.1
Midland Electric Coal Corporation	3,379,443	7	7.0
Ayrshire Collieries Corporation	2,432,241	8	5.0
Sahara Coal Co., Inc.	1,929,781	9	4.0
Stonefort Coal Mining Co., Inc.	1,160,576	10	2.4
Southwestern Illinois Coal Corporation	1,062,503	11	2.2
Saxton Coal Corporation	656,757	12	1.4
Morgan Coal Company	505,698	13	1.0
Lumaghi Coal Company	486,582	14	1.0
Little Dog Coal Company	318,096	15	.7
63 remaining companies	1,977,384		4.1
TOTAL 1962 Production of Coal in Illinois	48,353,913		100.0

*/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1962, Department of Mines and Minerals, State of Illinois, Table 10, pages 30-47.

GX 68

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES */ FOR THE 1963 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	15,110,212	1	29.3
Freeman Coal Mining Corporation, subsidiary of General Dynamics Corporation	6,928,804	2	13.4
Consolidation Coal Co., Truax-Traer Division	5,296,352	3	10.2
The United Electric Coal Companies	4,944,935	4	9.6
Old Ben Coal Corporation	4,110,778	5	8.0
Zeigler Coal & Coke Co.	3,339,199	6	6.5
Ayrshire Collieries Corporation	2,957,497	7	5.7
Sahara Coal Co., Inc.	2,137,753	8	4.1
Stonefort Coal Mining Co., Inc.	1,322,879	9	2.6
Southwestern Illinois Coal Corporation	985,730	10	1.9
Young's Coal Corporation	640,660	11	1.2
Lumaghi Coal Company	528,864	12	1.0
Morgan Coal Company	352,968	13	.7
Crab Orchard Cooperative Coal Co.	308,642	14	.6
J. W. Coal Company, Inc.	300,132	15	.6
63 remaining companies	2,377,026		4.6
TOTAL 1963 Production of Coal in Illinois	51,642,431		100.0

*/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1963, Department of Mines and Minerals, State of Illinois, Table 10, pages 30-47.

GX 69

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES */ FOR THE 1964 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	16,530,643	1	30.1
Freeman Coal Mining Corporation, subsidiary of General Dynamics Corporation	7,017,031	2	12.8
The United Electric Coal Companies	5,793,936	3	10.6
Consolidation Coal Co., Truax-Traer Division	5,736,485	4	10.4
Old Ben Coal Corporation	4,540,879	5	8.3
Zeigler Coal & Coke Co.	3,438,660	6	6.3
Ayrshire Collieries Corporation	2,888,888	7	5.3
Sahara Coal Co., Inc.	2,282,351	8	4.2
Southwestern Illinois Coal Corporation	1,824,449	9	3.3
Stonefort Coal Mining Co., Inc.	1,242,306	10	2.3
Young's Coal Corporation	609,656	11	1.1
Little Dog Coal Company	373,937	12	.7
J. W. Coal Company, Inc.	338,732	13	.6
58 remaining companies	2,216,535		4.0
TOTAL 1964 Production of Coal in Illinois	54,834,488		100.0

*/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1964, Department of Mines and Minerals, State of Illinois, Table 10, pages 30-47.

GX 70

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES */ FOR THE 1965 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	17,111,524	1	29.4
Freeman Coal Mining Corporation, subsidiary of General Dynamics Corporation	7,257,856	2	12.5
Consolidation Coal Co., Truax-Traer Division	5,471,467	3	9.4
The United Electric Coal Companies	5,348,641	4	9.2
Southwestern Illinois Coal Corporation	5,130,198	5	8.8
Old Ben Coal Corporation	4,720,256	6	8.1
Zeigler Coal & Coke Co.	3,500,132	7	6.0
Ayrshire Collieries Corporation	2,693,198	8	4.6
Sahara Coal Co., Inc.	2,379,692	9	4.1
Stonefort Coal Mining Co., Inc.	1,386,169	10	2.4
Little Dog Coal Company	378,980	11	.6
J. W. Coal Company, Inc.	378,419	12	.6
New Gallatin Coal Co.	328,765	13	.6
Youngs' Coal Corporation	327,840	14	.6
Big Muddy Coal Company	319,105	15	.5
44 remaining companies	1,500,238		2.6
TOTAL 1965 Production of Coal in Illinois	58,232,480		100.0

*/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1965, Department of Mines and Minerals, State of Illinois, Table 10, pages 30-45.

GX 71

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES */ FOR THE 1966 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	19,337,269	1	30.6
Freeman Coal Mining Corporation, subsidiary of General Dynamics Corporation	7,706,710	2	12.2
Consolidation Coal Co. (a subsidiary of Continental Oil Co.), Truax-Traer Division	6,863,214	3	10.8
Southwestern Illinois Coal Corporation	6,786,797	4	10.7
Old Ben Coal Corporation	6,056,409	5	9.6
The United Electric Coal Companies	5,854,938	6	9.3
Zeigler Coal & Coke Co.	3,286,410	7	5.2
Sahara Coal Co., Inc.	2,528,877	8	4.0
Ayrshire Collieries Corporation	2,326,835	9	3.7
Little Dog Coal Company	447,676	10	.7
37 remaining companies	2,017,562		3.2
TOTAL 1966 Production of Coal in Illinois	63,212,697		100.0

*/ Production in excess of 300,000 tons.

Source: Coal Report of Illinois, 1966, Department of Mines and Minerals, State of Illinois, Table 10, pages 30-43.

GX 72

PRODUCTION OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES 1/ FOR THE 1967 CALENDAR YEAR

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company	20,158,284 2/	1	31.1
General Dynamics Corporation	14,123,787	2	21.8
Freeman Coal Mining Corporation	8,380,496		(12.9)
The United Electric Coal Companies	5,743,291		(8.9)
Southwestern Illinois Coal Corporation	7,526,586	3	11.6
Consolidation Coal Co. (a subsidiary of Continental Oil Co.), Truax-Traer Division	6,906,346	4	10.6
Old Ben Coal Corporation	5,989,539	5	9.3
Zeigler Coal & Coke Co.	2,898,399	6	4.5
Sahara Coal Co., Inc.	2,550,507	7	3.9
Ayrshire Collieries Corporation	2,367,983	8	3.7
Main Line Coal Corporation	587,784	9	.9
Little Dog Coal Company	416,049	10	.6
29 remaining companies	1,289,507		2.0
TOTAL 1967 Production of Coal in Illinois	64,814,771		100.0

1/ Production in excess of 300,000 tons.

2/ Pursuant to Final Judgment dated October 23, 1967 in United States v. Peabody Coal Company et al., Civil Action No. 67 C 1621 (N.D. Illinois), 1967 Trade Cases Sec. 72,213, Peabody is to divest itself on or before October 23, 1969 of mines having annual production of 6,000,000 tons of coal. In compliance with this judgment, Peabody is in the process of selling its Mecco, Allendale, and Elm (a combination of the Bright Star, Middle Grove, and Elmwood [not in production in 1967] mines) Mines, all of which are located in Illinois. In 1967 these mines produced a total of 2,495,297 tons of coal.

Source: Coal Report of Illinois, 1967, Department of Mines and Minerals, State of Illinois, Table 10, pages 30-43.

Agreed to by Defendants
Not agreed to by Plaintiff

GOVERNMENT EXHIBIT 73

PRODUCTION OF COAL IN ILLINOIS, 1957-1967

Year	Total Production	Number of Companies	Production of Top 2		Production of Top 4		Production of Top 10	
			Tons	% of Total	Tons	% of Total	Tons	% of Total
1957	46,682,889	144	17,641,956	37.8	25,431,562	54.5	39,220,786	84.0
1958	43,777,130	133	15,586,600	35.6	23,513,152	53.7	37,262,760	85.1
1959	45,374,626	122	16,447,156	36.2	24,969,003	55.0	39,556,998	87.2
1960	45,820,632	98	16,252,809	35.5	25,410,953	55.5	39,733,616	86.7
1961	45,132,526	93	16,342,597	36.2	25,217,950	55.9	39,409,279	87.3
1962	48,353,913	78	17,337,111	35.8	27,205,414	56.3	43,346,893	89.6
1963	51,642,431	74	22,039,016	42.7	32,280,303	62.5	47,134,139	91.3
1964	54,834,488	71	23,547,674	42.9	35,078,095	64.0	51,295,628	93.5
1965	58,232,480	59	24,369,380	41.8	35,189,488	60.4	54,999,133	94.4
1966	63,212,697	47	27,043,979	42.8	40,693,990	64.4	61,195,135	96.8
1967	64,814,771	39	34,282,071	52.9	48,715,003	75.2	63,525,264	98.0

Source: Coal Reports of Illinois, 1957-1967, Department of Mines and Minerals, State of Illinois, Table 10.

GOVERNMENT EXHIBIT 74

SALES OF COAL IN ILLINOIS BY THE LEADING COMPANIES AND THEIR SUBSIDIARIES IN 1967
(From Mines Located in Eastern Interior Coal Province)

Name of Company	Sales of Coal in Tons	Rank	Percentage of Total Sales
Peabody Coal Company	13,320,890	1	28.5
General Dynamics Corporation	7,531,907	2	16.1
Freeman Coal Mining Corporation	3,933,322		(8.4)
The United Electric Coal Companies	3,598,585		(7.7)
Southwestern Illinois Coal Corporation	5,535,700	3	11.9
Consolidation Coal Co. (a subsidiary of Continental Oil Co.), Truax-Traer Division	4,363,324	4	9.3
Ayrshire Collieries Corporation	1,998,329	5	4.3
Old Ben Coal Corporation	1,970,377	6	4.2
Sahara Coal Co., Inc.	1,520,214	7	3.3
Zeigler Coal & Coke Co.	1,092,481	8	2.3
The Pittsburg & Midway Coal Mining Co., subsidiary of Gulf Oil Corporation	740,515	9	1.6
Island Creek Coal Co., West Kentucky Division	442,737	10	1.0
TOTAL of Leading Companies	38,516,474		82.5
TOTAL SALES of coal in Illinois	46,710,000		

Source: Answers to Government's questionnaire of July 15, 1968 and Gallagher Deposition Exhibit No. 3.

GOVERNMENT EXHIBIT 75

PRODUCTION OF COAL IN ILLINOIS (PRODUCING DISTRICT NO. 10), INDIANA (PRODUCING DISTRICT NO. 11), AND WESTERN KENTUCKY (PRODUCING DISTRICT NO. 9) BY THE LEADING COMPANIES 1/ AND THEIR SUBSIDIARIES IN CALENDAR YEAR 1957

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company 2/	20,250,902	1	22.1
Freeman Coal Mining Corporation, subsidiary of Material Service Corporation	6,905,475	2	7.5
West Kentucky Coal Co.	6,531,986	3	7.1
Ayrshire Collieries Corporation	5,778,910	4	6.3
The United Electric Coal Companies	4,512,096	5	4.9
Truax-Traer Coal Company 3/	4,162,618	6	4.5
Zeigler Coal & Coke Co. 4/	3,611,108	7	3.9
Old Ben Coal Corporation 5/	3,500,262	8	3.8
The Pittsburg & Midway Coal Mining Co.	2,514,432	9	2.7
Midland Electric Coal Corporation 6/	2,410,048	10	2.6
Sahara Coal Co., Inc. 7/	1,797,438	11	2.0
Snow Hill Coal Corporation	1,795,801	12	2.0
The Maumee Collieries Company	1,628,542	13	1.8
Rhos Coal Corporation	1,476,476	14	1.6
Stonefort Corporation 8/	1,153,538	15	1.3
TOTAL of Leading Companies	68,029,632		74.1
TOTAL PRODUCTION in Illinois, Indiana and Western Kentucky	91,839,000		

See footnotes on page 2.

Agreed to by Plaintiff
Not Agreed to by Defendants

1/ Production in excess of 1,000,000 tons.

2/ 1957 Coal Report of Illinois shows 6,251 tons less for Peabody Coal Company.

3/ 1957 Coal Report of Illinois shows 7,745 tons more for Truax-Traer Coal Company.

4/ 1957 Coal Report of Illinois shows 5,557 tons more for Zeigler Coal & Coke Co.

5/ 1957 Coal Report of Illinois shows 19,001 tons more for Old Ben Coal Corporation.

6/ 1957 Coal Report of Illinois shows 42,842 tons less for Midland Electric Coal Corporation.

7/ 1957 Coal Report of Illinois shows 208,084 tons less for Sahara Coal Co., Inc.

8/ 1957 Coal Report of Illinois shows 9,144 tons less for Stonefort Corporation.

Source: "Report of Mine Performance . . . January through December, 1957 and 1958, for Illinois, Indiana and Western Kentucky, by districts" published by Mid-West Coal Producers Institute, Inc.; and Bituminous Coal Facts, 1964, published by National Coal Association.

Agreed to by Defendants
Not agreed to by Plaintiff

GOVERNMENT EXHIBIT 77

PRODUCTION OF COAL IN ILLINOIS (PRODUCING DISTRICT NO. 10) INDIANA (PRODUCING DISTRICT NO. 11), AND WESTERN KENTUCKY (PRODUCING DISTRICT NO. 9) BY THE LEADING COMPANIES 1/ AND THEIR SUBSIDIARIES IN CALENDAR YEAR 1959

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company 2/	22,936,841	1	25.5
Freeman Coal Mining Corporation, subsidiary of Material Service Corporation	6,858,695	2	7.6
Ayrshire Collieries Corporation	6,135,629	3	6.8
West Kentucky Coal Co.	6,000,488	4	6.7
Truax-Traer Coal Company 3/	4,764,483	5	5.3
The United Electric Coal Companies 4/	4,338,544	6	4.8
Zeigler Coal & Coke Co. 5/	4,217,466	7	4.7
Old Ben Coal Corporation 6/	3,757,367	8	4.2
The Pittsburg & Midway Coal Mining Co.	3,177,063	9	3.5
Midland Electric Coal Corporation 7/	2,441,112	10	2.7
Sahara Coal Co., Inc. 8/	1,787,293	11	2.0
Snow Hill Coal Corporation	1,471,166	12	1.6
Enos Coal Corporation	1,403,958	13	1.6
Southwestern Illinois Coal Corporation 9/	1,155,384	14	1.3
TOTAL of Leading Companies	70,445,489		78.3
TOTAL PRODUCTION in Illinois, Indiana and Western Kentucky	89,886,000		

See footnotes on page 2.

1/ Production in excess of 1,000,000 tons.

2/ 1959 Coal Report of Illinois shows 5,329 tons more for Peabody Coal Company.

3/ 1959 Coal Report of Illinois shows 2 tons less for Truax-Traer Coal Company.

4/ 1959 Coal Report of Illinois shows 5,516 tons more for The United Electric Coal Companies.

5/ 1959 Coal Report of Illinois shows 10 tons less for Zeigler Coal & Coke Co.

6/ 1959 Coal Report of Illinois shows 1 ton less for Old Ben Coal Corporation.

7/ 1959 Coal Report of Illinois shows 41,556 tons more for Midland Electric Coal Corporation.

8/ 1959 Coal Report of Illinois shows 149,842 tons less for Sahara Coal Co., Inc.

9/ 1959 Coal Report of Illinois shows 17,252 tons less for Southwestern Illinois Coal Corporation.

Source: "Report of Mine Performance . . . January through December, 1959 and 1960, for Illinois, Indiana and Western Kentucky, by districts" published by Mid-West Coal Producers Institute, Inc.; and Bituminous Coal Facts, 1968, published by National Coal Association.

GOVERNMENT EXHIBIT 85

Revised

PRODUCTION OF COAL IN ILLINOIS (PRODUCING DISTRICT NO. 10), INDIANA (PRODUCING DISTRICT NO. 11), AND WESTERN KENTUCKY (PRODUCING DISTRICT NO. 9) BY THE LEADING COMPANIES 1/ AND THEIR SUBSIDIARIES IN CALENDAR YEAR 1967

Name of Company	Production of Coal in Tons	Rank	Percentage of Total Production
Peabody Coal Company 2/	48,808,013 3/	1	37.7
General Dynamics Corporation	14,123,594	2	10.9
Freeman Coal Mining Corporation	8,380,496		(6.5)
The United Electric Coal Companies 4/	5,743,098		(4.4)
Old Ben Coal Corporation	9,457,647	3	7.3
Island Creek Coal Co., West Kentucky Division	9,060,961	4	7.0
Ayrshire Collieries Corporation	8,604,021	5	6.6
Southwestern Illinois Coal Corporation	7,526,586	6	5.8
The Pittsburg & Midway Coal Mining Co., subsidiary of Gulf Oil Corporation	7,051,786	7	5.5
Consolidation Coal Co. (a subsidiary of Continental Oil Co.), Truax-Traer Division 5/	6,906,344	8	5.3
Zeigler Coal & Coke Co. 6/	3,940,921	9	3.0
Sahara Coal Co., Inc. 7/	2,823,526	10	2.2
TOTAL of Leading Companies	118,303,399		91.4
TOTAL PRODUCTION in Illinois, Indiana and Western Kentucky	129,500,000		

See footnotes on page 2.

1/ Production in excess of 1,000,000 tons.

2/ 1967 Coal Report of Illinois shows 15,832 tons less for Peabody Coal Company.

3/ Pursuant to Final Judgment dated October 23, 1967 in United States v. Peabody Coal Company et al., Civil Action No. 67 C 1621 (N.D. Illinois), 1967 Trade Cases Sec. 72,213, Peabody is to divest itself on or before October 23, 1969 of mines having annual production of 6,000,000 tons of coal. In compliance with this judgment, Peabody is in the process of selling its Macco, Allendale, and Elm (a combination of the Bright Star, Middle Grove, and Elmwood [not in production in 1967] mines) Mines, all of which are located in Illinois. In 1967 these mines produced a total of 2,495,297 tons of coal.

This figure includes 1,436,358 tons sold by Squaw Creek Mine and 4,625,456 tons sold by Sinclair Mine during 1965 since production figures for these two mines were not available. The Squaw Creek Mine is operated pursuant to a joint venture between Peabody and Aluminum Company of America. The entire production of the mine is consumed by Alcoa and is not available for sale on the open market. Peabody receives 40 per cent of the operating profits from this mine.

4/ 1967 Coal Report of Illinois shows 193 tons more for The United Electric Coal Companies.

5/ 1967 Coal Report of Illinois shows 2 tons more for Truax-Traer Division of Consolidation Coal Co.

6/ 1967 Coal Report of Illinois shows 1 ton less for Zeigler Coal & Coke Co.

7/ 1967 Coal Report of Illinois shows 273,019 tons less for Sahara Coal Co., Inc.

Source: "Report of Mine Performance . . . January through December, 1966 and 1967, for Illinois, Indiana and Western Kentucky, by districts" published by Mid-West Coal Producers Institute, Inc.; Bituminous Coal Facts, 1968, published by National Coal Association; and Peabody's Answers to Government's Questionnaire of July 15, 1968.

Agreed to by Defendants
Not agreed to by Plaintiff

GOVERNMENT EXHIBIT 86

PRODUCTION OF COAL IN ILLINOIS (PRODUCING DISTRICT NO. 10), INDIANA (PRODUCING DISTRICT NO. 11), AND WESTERN KENTUCKY (PRODUCING DISTRICT NO. 9), 1957-1967

Year	Total Production	Production of Top 2		Production of Top 4		Production of Top 8	
		Tons	% of Total	Tons	% of Total	Tons	% of Total
1957	91,839,000	27,156,377	29.6	39,467,273	43.0	60,177,837	65.5
1958	87,016,000	26,530,109	30.5	37,974,636	43.6	58,991,908	67.6
1959	89,886,000	29,795,536	33.1	41,931,653	46.6	64,627,688	71.9
1960	92,102,000	30,673,473	33.3	42,812,763	46.5	65,886,556	71.5
1961	90,964,000	31,302,531	34.4	42,911,278	47.2	65,513,639	72.
1962	96,251,000	34,069,705	35.4	46,288,972	48.1	72,845,323	75.7
1963	102,552,000	42,594,749	41.5	55,104,786	53.7	80,153,696	78.2
1964	107,954,000	46,843,007	43.4	59,653,974	55.3	87,402,506	81.0
1965	113,247,000	48,221,904	42.6	63,196,841	55.8	96,511,201	85.2
1966	123,087,000	54,258,079	44.1	70,955,144	57.6	109,398,100	88.9
1967	129,500,000	62,931,607	48.6	81,450,215	62.9	118,303,389	91.4

Source: "Report of Mine Performance . . . January through December . . . for Illinois, Indiana and Western Kentucky, by districts" published by Mid-West Coal Producers Institute, Inc.; Bituminous Coal Facts, published by National Coal Association; letter dated November 4, 1968 from Peabody Coal Company to Department of Justice; 1967 Annual Report of Kentucky Department of Mines and Minerals; and Peabody's response to Government's questionnaire of July 15, 19[illegible].

87

ACQUISITIONS IN EASTERN INTERIOR COAL PROVINCE SINCE 1954

Name of Acquiring Company	Name of Company Acquired	Date of Acquisition	Name of Mine Acquired	Cost (Dollars)	Production Last Full Year before Acquisition (Tons)
PEABODY COAL COMPANY and its subsidiaries	Morgan Mines, Inc.	1956	Energy Mine	750,000.00	409,410
	Midwest-Radiant Corporation	1956	Midwest Mine)		507,600
	Perry Coal Company	1956	St. Ellen Mine)	5,358,771.00	1,070,339
	Poplar Ridge Coal Company	1956	Poplar Ridge Mine	892,411.00	807,263
	Terteling Bros., Inc.	1957	Pond River Mine	4,002,400.00	427,528
			Vogue Mine		492,067
	Black Star Coal Corporation	1958	Alva Mine	3,170,000.00	550,000
	The Maumee Collieries Company	1959	Linton Mine)		NA
			Chieftain Mine)		472,690
			Old Glory Mine)	7,411,500.00	113,699
			Airline Mine)		760,478
	Hart & Hart	1961	Hart & Hart Mine	1,150,000.00	100,000
	Morgan Coal Company	1963	Edwards Mine	600,000.00	175,000
			Utility Mine	750,000.00	200,000
	Riverview Coal Company, Inc.	1963	Riverview Mine	2,500,000.00	600,000
	Midland Electric Coal Corporation	1963	Green Diamond Mine)		968,321
			Viking Mine)		709,787
			Green Valley Mine)		823,185
			Atkinson-Mineral Mine)	15,928,117.00	290,351
			Middle Grove-Rapatee Mine)		1,266,876
			Victoria Mine)		860,768

Name of Acquiring Company	Name of Company Acquired	Date of Acquisition	Name of Mine Acquired	Cost (Dollars)	Production Last Full Year before Acquisition (Tons)
PEABODY COAL COMPANY and its subsidiaries (Contd.)	Stonefort Coal Mining Company, Inc.	January 1966	Allendale Mine Will Scarlet Mine	6,639,300.00	531,690 852,884
E WESTERN ILLINOIS COAL CORPORATION	NONE				
CRUAX-THAER COAL COMPANY	Little Sister Coal Corporation	5-18-56	Little Sister Mine	175,000 shares of common stock at 27-1/2 per share	668,021
	New Kathleen Mine of Union Colliery Company	5-29-58	New Kathleen Mine	1,046,044.00	1,156,065
OLD BEN COAL CORPORATION and its subsidiary		*/	Kings Mine	*/	507,754
	Enos Coal Division Interlake Steel Corp.	10-13-65	Enos Mine Blackfoot #5 Mine	15,866,510.00	1,731,540 715,105
E SPA COAL CO., INC.	NONE				

*/ This mine closed 3/31/66 by Princeton Mining Co. and reopened as a new mine on a lease basis by Kings Station Coal Corporation (subsidiary of Enos Coal Corporation) on 9/26/66. This was not the acquisition of an active coal producer or of a producing property but the acquisition of mining rights from several sources.

Name of Acquiring Company	Name of Company Acquired	Date of Acquisition	Name of Mine Acquired	Cost (Dollars)	Production Last Full Year before Acquisition (Tons)
ZEIGLER COAL & COKE CO. and its subsidiary	Midwest Utilities Co.	1-1-57	Bradbury Mine	2,720,000.00	847,498
	Moffat Coal Co.	3-15-55	Moffat Mine	600,000.00	295,412
HIX COLLIERIES CORPORATION	Carmac Coal Company	Feb. 1956	Carmac Mine	565,108.03	296,099
	Friar Tuck Mine of Sherwood-Templeton Co.	Jan. 1960	Friar Tuck Mine	1,550,000.00	401,320
THE UNITED ELECTRIC COAL COMPANIES	NONE				
FREEMAN COAL MINING CORPORATION and subsidiary		2-1-55	Orient No. 3 Mine	8,082,000.00	1,579,296 */
		6-30-59	Orient No. 5 Mine	211,602.94	
		6-30-59	Orient No. 2 Mine	1,129,197.63	1,071,377 */
THE PITTSBURG & MIDWAY COAL MINING CO.	NONE				
SHERWOOD-TEMPLETON COAL COMPANY, INC.		4-1-61	Pioneer Mine	700,729.03	139,954 */
KARRAPA KAY COAL, INC.	NONE				

*/ These figures taken from Coal Report of Illinois, 1954, 1958 and 1960.

Name of Acquiring Company	Name of Company Acquired	Date of Acquisition	Name of Mine Acquired	Cost (Dollars)	Production Last Full Year before Acquisition (Tons)
ISLAND CREEK COAL COMPANY	Island Creek Coal Co.	1-29-68	East Diamond	149,470,600.00	2,374,000
			Pleasant View		566,000
			Atkinson		1,472,000
			Pies		1,443,000
			Crescent		1,049,000
			Williams		237,000
			Uniontown		1,491,000
			Hamilton		Under construction
	West Kentucky Coal Co.	12-31-64	East Diamond	15,930,717.00	1,878,671
			Pleasant View		1,106,938
	Nashville Coal, Inc. (Subsidiary of West Kentucky Coal Co.)		Atkinson		Closed
			Pies		1,035,214
			Crescent		922,311
			Williams		162,939
			Uniontown		1,498,218
			Stoney Point		Closed
NASHVILLE COAL, INC. (Subsidiary of Island Creek Coal Company)	Nashville Coal Co., Inc.	9-13-55	Pies	17,329,368.00	Not available
			Crescent		" "
			Williams		" "
			Uniontown		" "
			Stoney Point		" "

Name of Acquiring Company	Name of Company Acquired	Date of Acquisition	Name of Mine Acquired	Cost (Dollars)	Production Last Full Year before Acquisition (Tons)
BELLE VALLEY COAL COMPANY, INC.	NONE				
BLACK TAM MINING COMPANY	NONE				
GIBRALTAR COAL CORPORATION	NONE				
GREEN COAL CO.	NONE				
HOUGTON COAL CO.	NONE				
KIRKPATRICK MINING COMPANY	NONE				
LIBERTY COAL COMPANY	NONE				
MORRIS BROS. CO.	NONE				
MORRIS ENTERPRISES	NONE				
PIALTO COAL COMPANY, INC.	Sternberg Coal Corp.	1963	Jiffy Mine		Not available

Name of Acquiring Company	Name of Company Acquired	Date of Acquisition	Name of Mine Acquired	Cost (Dollars)	Production Last Full Year before Acquisition (Tons)
TAB-BADGETT, Joint Venture	NONE				
CHT COAL COMPANY	NONE				

ree: Answers to Government's questionnaire of August 12, 1968.

GOVERNMENT EXHIBIT
88

Revised

COMMON KNOWN CUSTOMERS OF THE UNITED ELECTRIC COAL COMPANIES AND FREEMAN COAL MINING CORPORATION
SHOWING DESTINATION POINTS - 1965

	The United Electric Coal Companies				Freeman Coal Mining Corporation			
Name of Customer	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
Caterpillar Tractor Co. Peoria, Illinois	Cuba-Buckheart	Plant at Montgomery, Ill.	123,879	29,143	Crown	Plant at Decatur, Illinois	138,257	30,067
	Cuba-Buckheart	Plant at E. Peoria, Ill.	84,900	19,810				
Central Illinois Light Co. Peoria, Illinois	Cuba-Buckheart	Liberty St. Plant Peoria, Illinois	1,455,833	364,870	Crown	Plant at Springfield, Ill.	83,769	18,290
Central Illinois Public Service Company Springfield, Illinois	Fidelity	Grand Tower Plant Grand Tower, Ill.	46,775	15,089	Orient #4	Grand Tower Plant Grand Tower, Ill.	303,366	102,803
	Cuba-Buckheart	Meredosia Plant Meredosia, Ill.	387,917	100,484	Crown	Meredosia Plant Meredosia, Ill.	262,892	82,148
	Banner	Meredosia Plant Meredosia, Ill.	221,394	52,252				
Commonwealth Edison Co. Chicago, Illinois	Cuba-Buckheart	River Stations	5,514,897	1,542,127	Crown	River Stations	3,159,489	816,405
	Banner	River Stations	238,444	51,452	Crown	State Line Plant Hammond, Indiana	2,247,840	580,847
					Orient #5	State Line Plant Hammond, Indiana	74,817	20,551
					Orient #5	Waukegan Plant Waukegan, Illinois	355,335	97,757
					Orient #4	Waukegan Plant Waukegan, Illinois	63,673	17,493

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
Dairyland Power Cooperative 1/ La Crosse, Wisconsin	Fidelity	Alma Plant Alma, Wisconsin	137,674 2/	25,308	Not available	Alma Plant Alma, Wisconsin	289,327 2/	56,620
	Fidelity	E.J. Stoneman Plant Cassville, Wisconsin	63,539 2/	11,063	NA	E.J. Stoneman Plant Cassville, Wis.	36,166 2/	7,147
Foote Minerals FMCO Operations Keokuk, Iowa	Cuba-Buckheart	Plant at Keokuk, Iowa	119,997	31,086	Orient #3	Plant at Keokuk, Iowa	72,927	25,589
Illinois Power Co. Decatur, Illinois	Mary Moore	Vermillion Plant Oakwood, Illinois	81,777	24,524	Orient #4	Vermillion Plant Oakwood, Illinois	249,778	37,938
	Panner	Hennepin Plant Hennepin, Illinois	283,255	65,204	Orient #5	Vermillion Plant Oakwood, Illinois	522,725	179,015
	Cuba-Buckheart	Hennepin Plant Hennepin, Illinois	351,228	93,775	Orient #3	Wood River Plant Alton, Illinois	339,064	116,918
Inland Steel Co. Chicago, Illinois	Cuba-Buckheart	E. Chicago Plant E. Chicago, Ind.	134,016	36,445	Orient #3	E. Chicago Plant E. Chicago, Ind.	1,713,329	332,737
Marquette Cement Mfg. Co. Chicago, Illinois	Cuba-Buckheart	Oglesby Plant Oglesby, Illinois	1,170,490	275,406	Orient #4	Cape Girardeau Plant Cape Girardeau, Mo.	710,530	168,372
					Orient #3	Des Moines Plant Des Moines, Iowa	114,860	28,715
					Orient #3	Milwaukee Plant Milwaukee, Wis.	149,958	27,132

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
Northern States Power Co. Minneapolis, Minn.	Fidelity	Mississippi River Stations	999,101	280,416	Orient #5	Riverside Plant (A Mississippi River Station)	NA	3,053 [3]
Tennessee Valley Authority Chattanooga, Tenn.	Fidelity	Shawnee Steam Plant Chiles, Kentucky	749,276	263,373	Orient #3	Shawnee Steam Plant Chiles, Kentucky	1,251,487	431,194
					Orient #4	Shawnee Steam Plant Chiles, Kentucky	275,307	97,283
					Orient #5	Shawnee Steam Plant Chiles, Kentucky	951,615	327,673
Union Electric Company St. Louis, Missouri	NA	Venice Plant Venice, Illinois	NA	3,000 [4]	Orient #3	Venice Plant Venice, Illinois	311,936	128,899
	Fidelity	Meramec Plant Hill Crest, Mo.	1,653,520	482,722	Orient #2	Meramec Plant Hill Crest, Mo.	417,496	172,519
Wisconsin Public Service Co. Green Bay, Wisconsin	Fidelity	J.P. Pulliam Plant Green Bay, Wis.	301,224	84,377	Orient #4	J.P. Pulliam Plant Green Bay, Wis.	181,134	50,738
					Orient #5	J.P. Pulliam Plant Green Bay, Wis.	389,676	109,153
Total Sales to Common Customers			14,119,136	3,851,926			14,667,253	4,067,056
Total Sales in 1965				5,486,994				7,915,832
Sales to Common Customers as Per Cent of Total Sales				70.2%				51.4%

Footnotes on following page

Footnotes:

Source: Answers to Government's questionnaire of July 15, 1968.

1/ Source--Letter with attachment from John P. Madgett, Dairyland Power Cooperative, to the Department of Justice dated April 23, 1968

2/ Includes freight.

3/ In 1964 Freeman Coal Mining Corporation's Orient #5 Mine shipped 43,018 tons of coal to the Riverside Plant, a Mississippi River Station of Northern States Power Co. In this same year The United Electric Coal Companies shipped 53,491 tons to Northern States Power Co.'s Riverside Station and a total of 311,373 tons to all of the Mississippi River Stations of Northern States Power Co. Source--Letter with attachments from V. H. Wood, Northern States Power Co., to the Department of Justice dated May 31, 1968.

4/ Source--Letter from Stewart W. Smith, Jr., Union Electric Company, to the Department of Justice dated March 5, 1969.

GOVERNMENT EXHIBIT 89

Revised

COMMON KNOWN CUSTOMERS OF THE UNITED ELECTRIC COAL COMPANIES AND FREEMAN COAL MINING CORPORATION
SHOWING DESTINATION POINTS - 1966

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
Caterpillar Tractor Co. Peoria, Illinois	Cuba-Buckheart	Plant at E. Peoria, Illinois	94,520	21,533	Crown	Plant at Decatur, Illinois	175,023	37,106
	Cuba-Buckheart	Plant at Montgomery, Ill.	126,788	29,573				
Central Illinois Light Co. Peoria, Illinois	Cuba-Buckheart	Liberty St. Plant Peoria, Illinois	1,357,352	333,345	NA	Plant at Springfield, Ill. 1/	68,536 2/	14,043 2/
Central Illinois Public Service Company Springfield, Illinois	Cuba-Buckheart	Meredosia Plant Meredosia, Ill.	478,214	120,110	Crown	Meredosia Plant Meredosia, Ill.	279,889	84,614
	Banner	Meredosia Plant Meredosia, Ill.	372,838	81,917	Orient #4	Grand Tower Plant Grand Tower, Ill.	311,209	100,143
	Fidelity	Grand Tower Plant Grand Tower, Ill.	55,269	17,186	Orient #3	Grand Tower Plant Grand Tower, Ill.	50,779	16,677
Commonwealth Edison Co. Chicago, Illinois	Cuba-Buckheart	River Stations	5,702,262	1,605,459	Orient #5	Waukegan Plant Waukegan, Illinois	136,606	37,529
	Banner	River Stations	822,014	172,151	Crown	River Stations 1/	5,888,360	1,627,308
Dairyland Power Cooperative 4/ La Crosse, Wisconsin	Fidelity	Alma Plant Alma, Wisconsin	179,662 3/	32,096	NA	Alma Plant Alma, Wisconsin	320,693 3/	59,272
	Fidelity	E.J. Stoneman Plant Cassville, Wisconsin	69,770 3/	12,755	NA	E.J. Stoneman Plant Cassville, Wisconsin	96,922 3/	18,000

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
Keoto Minerals MEMCO Operations Keokuk, Iowa	Cuba-Buckheart	Plant at Keokuk, Iowa	164,408	41,213	Orient #3	Plant at Keokuk, Iowa	94,664	31,131
Illinois Power Co. Decatur, Illinois	Cuba-Buckheart	Hennepin Plant Hennepin, Illinois	368,562	91,679	Orient #4	Vermillion Plant Oakwood, Ill.	376,376	123,894
	Banner	Hennepin Plant Hennepin, Illinois	337,989	72,818	Orient #3	Wood River Plant Alton, Illinois	406,227	140,717
					Orient #5	Wood River Plant Alton, Illinois	45,737	15,771
Marquette Cement Mfg. Co. Chicago, Illinois	Cuba-Buckheart	Plant at Oglesby, Illinois	1,231,517	283,692	NA	Plant at Oglesby, Illinois 6/	16,250 1/	3,934
					Orient #4	Cape Girardeau Plant Cape Girardeau, Mo.	720,287	166,919
					Orient #3	Des Moines Plant Des Moines, Iowa	88,619	21,626
					Orient #3	Milwaukee Plant Milwaukee, Wis.	231,909	43,519
Tennessee Valley Authority Chattanooga, Tenn.	Fidelity	Shawnee Steam Plant Chiles, Kentucky	747,125	254,607	Orient #3	Shawnee Steam Plant Chiles, Kentucky	1,371,606	454,662
					Orient #4	Shawnee Steam Plant Chiles, Kentucky	500,252	172,803
					Orient #5	Shawnee Steam Plant Chiles, Kentucky	605,996	206,493

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
A[illegible]n Electric Company St. Louis, Missouri	Fidelity	Venice Plant Venice, Illinois	110,884	31,420	Orient #3	Venice Plant Venice, Illinois	437,478	170,043
	Fidelity	Meramec Plant Hill Crest, Mo.	1,371,814	387,998	Orient #3	Meramec Plant Hill Crest, Mo.	281,455	109,228
Wisco[illegible]in Public Service Co. Gre[illegible] Bay, Wisconsin	Fidelity	J.P. Pulliam Plant Green Bay, Wis.	441,541	116,617	Orient #4	J.P. Pulliam Plant Green Bay, Wis.	317,346	83,512
					Orient #5	J.P. Pulliam Plant Green Bay, Wis.	102,415	26,951
Total Sales to Common Customers			14,034,529	3,706,169			12,924,634	3,765,897
Total Sales in 1966				5,964,160				8,562,402
Sales to Common Customers as Per Cent of Total Sales				62.1%				44.0%

Source: Answers to Government's questionnaire of July 15, 1968.

1/ Source--Letter from Q. W. Wellington, Central Illinois Light Co., to Department of Justice dated October 21, 1966.

2/ Source--Letter with attachment from W. T. Reid, Central Illinois Light Co., to Department of Justice dated March 23, 1968.

3/ Commonwealth Edison Co. apparently took title to the coal at the dock at Havana, Illinois and shipped it to its river stations.

4/ Source--Letter with attachment from John P. Madgett, Dairyland Power Cooperative, to the Department of Justice dated April 23, 1968.

5/ [illegible]cludes freight.

6/ Letter with attachment from William R. Engelhardt of Norman, Engelhardt, Holland, Billick, Franke & Lauritzen to Department of Justice dated July 19, 1968

7/ Includes tax.

Revised

COMMON KNOWN CUSTOMERS OF THE UNITED ELECTRIC COAL COMPANIES AND FREEMAN COAL MINING CORPORATION
SHOWING DESTINATION POINTS - 1967

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
Caterpillar Tractor Co. Peoria, Illinois	Cuba-Buckheart	Plant at E. Peoria, Ill.	98,271	21,886	Crown	Plant at Decatur, Illinois	164,616	34,295
	Cuba-Buckheart	Plant at Montgomery, Ill.	134,496	30,223				
Central Illinois Electric and Gas Co. (Division of Commonwealth Edison Co.) Chicago, Illinois	Fidelity	Plant at Rockford, Illinois	320,790	86,700	Orient #5	Plant at Rockford, Illinois	136,538	32,194
Central Illinois Light Co. Peoria, Illinois	Cuba-Buckheart	Liberty St. Plant Peoria, Illinois	1,460,273	352,073	HA	Plant at Springfield, Ill. 1/	56,035 2/	11,2[illegible]
Central Illinois Public Service Company Springfield, Illinois	Cuba-Buckheart	Meredosia Plant Meredosia, Illinois	264,911	66,469	Crown	Meredosia Plant Meredosia, Illinois	307,658	91,838
	Banner	Meredosia Plant Meredosia, Illinois	429,329	93,464	Orient #4	Grand Tower Plant Grand Tower, Ill.	417,239	132,457
	Fidelity	Grand Tower Plant Grand Tower, Illinois	52,089	16,027				
Commonwealth Edison Co. Chicago, Illinois	Cuba-Buckheart	River Stations	6,294,707	1,745,575	Crown	River Stations	6,114,470	1,726,083
	Banner	River Stations	624,922	132,472				

114

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
Dairyland Power Cooperative 1/ La Crosse, Wisconsin	Fidelity	Alma Plant Alma, Wisconsin	203,843	35,447	NA	Alma Plant Alma, Wisconsin	446,223	77,997
	Fidelity	E.J. Stoneman Plant Cassville, Wis.	43,861	7,636	NA	E.J. Stoneman Plant Cassville, Wis.	151,287	26,905
Foote Minerals KERMCO Operations Keokuk, Iowa	Cuba-Buckheart	Plant at Keokuk, Iowa	113,999	24,731	Orient #3	Plant at Keokuk, Iowa	94,186	20,88
Illinois Power Co. Decatur, Illinois	Cuba-Buckheart	Hennepin Plant Hennepin, Illinois	165,991	39,235	Orient #3	Wood River Plant Alton, Illinois	525,282	181,13
	Banner	Hennepin Plant Hennepin, Illinois	305,990	63,534	Orient #6	Vermillion Plant Oakwood, Illinois	132,089	29,84
	Banner	Wood River Plant Alton, Illinois	NA	68 2/				
Marquette Cement Mfg. Co. Chicago, Illinois	Cuba-Buckheart	Oglesby Plant Oglesby, Illinois	513,212	117,440	Orient #5	Cape Girardeau Plant Cape Girardeau, Mo.	405,391	99,767
	Banner	Oglesby Plant Oglesby, Illinois	873,007	166,287	Orient #6	Milwaukee Plant Milwaukee, Wis.	183,706	35,01
					Orient #3	Des Moines Plant Des Moines, Iowa	67,956	16,37
Tennessee Valley Authority Chattanooga, Tenn.	Fidelity	Shawnee Steam Plant Chiles, Kentucky	636,576	213,000	Orient #3	Shawnee Steam Plant Chiles, Kentucky	1,646,484	506,38
					Orient #6	Shawnee Steam Plant Chiles, Kentucky	564,469	187,79
						Shawnee Steam Plant Chiles, Kentucky	611,896	191,8

Name of Customer	The United Electric Coal Companies				Freeman Coal Mining Corporation			
	Mine	Destination	Dollar Volume	Number of Tons	Mine	Destination	Dollar Volume	Number of Tons
			$				$	
Union Electric Company St. Louis, Missouri	Fidelity	Venice Plant Venice, Illinois	73,245	20,185	Orient #3	Venice Plant Venice, Illinois	294,408	112,369
	Fidelity	Meramec Plant Hill Crest, Mo.	980,954	277,293	Orient #3	Meramec Plant Hill Crest, Mo.	508,588	191,038
Wisconsin Public Service Co. Green Bay, Wisconsin	Fidelity	J.P. Pulliam Plant Green Bay, Wis.	200,460	51,700	Orient #6	J.P. Pulliam Plant Green Bay, Wis.	467,596	173,027
Total Sales to Common Customers			14,007,456	3,641,445			13,229,596	3,842,967
Total Sales in 1967				5,913,500				9,077,563
Sales to Common Customers as Per Cent of Total Sales				61.61				42.35

Source: Answers to Government's questionnaire of July 15, 1968

1/ Source--Letter from G. W. Wellington, Central Illinois Light Co., to Department of Justice dated October 21, 1966.

2/ Source--Letter with attachment from W. T. Reid, Central Illinois Light Co., to Department of Justice dated March 23, 1968.

3/ Source--Letter with attachment from John P. Padgett, Dairyland Power Cooperative, to the Department of Justice dated April 23, 1968.

4/ Includes freight.

5/ Source--Letter with attachments from A. Kraskevik, Illinois Power Company, to Department of Justice dated March 12, 1968.

GX 91

PER CENT OF SALES OF EACH COMPANY TO IDENTICAL CUSTOMER FACILITIES BY THE UNITED ELECTRIC COAL COMPANIES AND FREEMAN COAL MINING CORPORATION FOR THE YEARS 1965-1967

	1965 %	1966 %	1967 %
The United Electric Coal Companies	54.7	52.9	48.2
Freeman Coal Mining Corporation	37.4	37.0	39.8

Source: Answers to Government's Questionnaire of July 15, 1968; Letter with attachment from John P. Madgett, Dairyland Power Cooperative, to the Department of Justice dated April 23, 1968; Letter with attachments from V. H. Wood, Northern States Power Co., to the Department of Justice dated May 31, 1968; Letter from Stewart W. Smith, Jr., Union Electric Company, to the Department of Justice dated March 5, 1969; Letter with attachment from William R. Engelhardt of Norman, Engelhardt, Holland, Billick, Franke & Lauritzen to the Department of Justice dated July 19, 1968; and Letter with attachments from A. Kraakevik, Illinois Power Company, to Department of Justice dated March 12, 1968.

CENTRAL ILLINOIS PUBLIC SERVICE COMPANY

GENERAL OFFICES 607 E. ADAMS ST.

SPRINGFIELD, ILLINOIS 62701

GOVERNMENT EXHIBIT 93

October 28, 1966

The Honorable Donald F. Turner
Assistant Attorney General
United States Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Dear Mr. Turner:

We have Mr. Bertram M. Long's letter of October 14, 1966 requesting certain information concerning the proposed acquisition of the stock of The United Electric Coal Companies by General Dynamics Corporation including coal purchases made by Central Illinois Public Service Company. The information requested is as follows:

1. The names of all coal suppliers for the years 1964 and 1965 are included on the attached tabulation.

2. Amount of coal in dollars and tons purchased is included in tabulation with 1.

3. Purchases of coal mined out-of-State by tons is included in tabulation with 1.

4. For many years it has been our practice to negotiate on an individual basis the terms of our coal purchases from our several coal suppliers. Several factors are considered in our coal purchasing decisions. Among these factors are: type of product (dust, screenings, carbon, etc.), BTU content, cost per million BTU (F.O.B. generating plant), sulfur and other impurities content, moisture content, amount of resulting ash, etc. Based upon the application of such factors, our coal purchases from Freeman Coal Mining Corporation and The United Electric Coal Companies have resulted in these two companies being among the principal suppliers of coal to two of our four electric generating stations (no coal is purchased from either company for use at our other two generating stations). In 1964 Freeman provided 24.8 percent and United Electric 2.9 percent of the total coal requirements at one of the generating stations, while at the other generating station the amounts were 12.3 percent and 23.8 percent, respectively. Similarly, in 1965,

DEPARTMENT OF JUSTICE
OCT 31 1966
DIVISION OF RECORDS

the relationships were 22.2 percent for Freeman and 3.0 percent for United Electric at the first station and 12.1 percent and 26.5 percent, respectively, for the second station. All factors considered, we have found the two companies to be competitive.

5. We do not know what effect, if any, there would be upon this company or other public utilities if General Dynamics Corporation were to be successful in acquiring all of the stock of The United Electric Coal Companies.

We trust that the above information is sufficiently complete for your purposes.

Yours very truly,

K. E. Bowen
Vice President

COAL PURCHASES - 1964 & 1965

Suppliers	Cost-1964	Tons-1964	Cost-1965	Tons-1965
Consolidation Coal Company	$ 785,214	214,830	$1,135,352	334,939
Truax-Traer Coal Company	667,122	214,110	535,320	145,846
Freeman Coal Mining Corporation	788,385	191,355	613,640	193,561
Peabody Coal Company	735,765	182,374	795,940	193,945
The United Electric Coal Companies	648,262	166,936	795,283	195,450
Republic Coal & Coke Company	468,096	152,417	760,927	193,426
Old Ben Coal Corporation	563,622	147,750	455,731	148,589
Sahara Coal Company, Inc.	525,385	128,914	486,957	127,108
Sterling-Midland Coal Company	353,337	115,021	304,323	73,877
Bell & Zoller Coal Company	303,148	80,366	363,355	118,607
Forsyth Coal Company	149,713	46,952	311,191	80,705
Gibson Coal Company	181,146	42,626	210,039	67,670
Enders Coal & Coke Company	11,606	4,068	99,666	23,675
Southern Illinois Co-op Coal Sales Co.	6,583	2,013	23,152	7,420
R. S. & K. Coal Corporation	5,547	1,871		
Sullivan Enterprises	5,821	1,699	53,672	18,108
Midvale Coal Company	2,358	762		
Royal Fuel Corporation	898	234	58,277	18,323
Reliable Coal & Mining Company	351	118		
Toledo Grain Company			58,069	17,896
Lafayette Coal Company			246	80
Illinois Central Railroad Company				
Total	$6,202,367	1,694,424	$7,061,151	1,959,232
Mined outside Illinois		48,965		67,670

GOVERNMENT EXHIBIT 94

ILLINOIS POWER COMPANY
500 South 27th Street
Decatur, Illinois 62525

October 17, 1966

Mr. Bertram M. Long
Assistant Chief, Midwest Office
Antitrust Division
United States Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

OCT 21 1966
ANSWERED BY LETTER
DATE 10-21-66

Dear Mr. Long:

(3) Both United Electric Coal Companies and Freeman Coal Mining Corporation have bid on supplying coal to our company. Other area coal suppliers also having bid for these requirements has satisfied us that the two named companies you have questioned have in fact held themselves out to be competitors.

I regret that due to my absence from the office for a few days that there has been a delay in responding to your letter.

Very truly yours,

Illinois Power Company

By _____
A. Kraakevik
Vice President

AK/g

60-0-37
DEPARTMENT OF JUSTICE RECORD
OCT 18 1966
DIVISION OF RECORDS
Chicago

[illegible] POWER CO.

Tons of Coal Purchased 1965

	Kanawa	Hancock	Vermilion	Wood River	Total Tons	Total Dollar
Freeman Coal Mng. Co.	-	-	215,331	116,940	332,271	1,539,568.02
United Elec. - (Banner)	-	66,606	-	-	66,606	338,358.48
United Elec. - (Buckhart)	-	101,883	-	-	101,883	504,320.85
United Elec. - (M. Moore)	-	-	22,675	-	22,875	105,453.75
V-Day Coal Co.	-	-	20,176	-	20,176	60,528.00
Total Tons Received	319,710	796,654	472,238	1,555,569	3,142,171	$14,217,856.33
	($1,489,868.60)	($3,990,698.60)	($2,227,223.41)	($6,510,085.72)		($14,217,856.33)

10-11-66

ILLINOIS POWER CO.

Tons of Coal Purchased 1966

	Havana	Hennepin	Vermilion	Wood River	Total Tons	Total Dollars
...na Coal Mng. Co.	-	-	33,608	115,177	148,785	660,468.93
...Electric	-	141,231	228,832	3,029	373,092	1,767,215.41
...ply	-	-	8,789	-	8,789	26,367.00
...Tons Received	360,581	781,576	485,784	942,818	2,570,759	$11,981,610.96
	($1,683,118.10)	($3,906,312.46)	($2,295,819.62)	($4,096,360.78)		($11,981,610.96)

GOVERNMENT EXHIBIT 104

CENTRAL ILLINOIS ELECTRIC AND GAS CO.
303 NORTH MAIN STREET
ROCKFORD, ILLINOIS, 61101

October 20, 1966

United States Department of Justice
Room 2634, United States Courthouse
Chicago, Illinois, 60604

Attention: Mr. Donald F. Turner,
Assistant Attorney General

Dear Mr. Turner:

This is in reply to your letter of October 14, 1966, in which you ask a series of questions relative to our coal purchases:

1. The names of the firms which supplied us with coal during the years 1964 and 1965 are the Old Ben Coal Corporation, 10 South Riverside Plaza, Chicago; Republic Coal & Coke Co., 8 South Michigan Avenue, Chicago; Truax-Traer Coal Company, Division of Consolidation Coal Company, 524 Commercial National Bank Building, Peoria, Illinois; The United Electric Coal Companies, 307 North Michigan Avenue, Chicago; and Peabody Coal Company, 122 West Washington Avenue, Madison, Wisconsin.

2. The amount of coal in dollars and tonnage is as follows:

	Tons	Dollars
1964		
United	51,688	189,520
	212,095	$798,263
1965		
United	38,804	143,692
	217,715	$835,505

DEPARTMENT OF JUSTICE
OCT 24 1966
DIVISION OF RECORDS

3. During the years 1964 and 1965, the coal purchased from Republic was mined in Indiana. All other coal was mined in the state of Illinois.

4. Our present contracts with the abovementioned coal companies were entered into in 1961 for a period of five years. Our records do not show whether Freeman Coal entered a bid at that time. We are at present inviting bids from the abovementioned companies and others, including Freeman, for our future coal supplies. At the present time we have had no formal bid from either United or Freeman.

5. We do not feel that the elimination of United Electric as an independent coal supplier would in any way affect our operation.

I trust that I have answered these questions to your satisfaction.

Yours very truly,

L. S. Berry,
Vice President, Electric Oper.

STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Commonwealth Edison Company
Application for authority to cause to be formed and to invest in a subsidiary corporation to conduct certain activities ancillary to its public utility business.

No.

PETITION

To the ILLINOIS COMMERCE COMMISSION:

COMMONWEALTH EDISON COMPANY (hereinafter called "Edison") respectfully says:

1. Edison is an Illinois corporation, with its principal office at One First National Plaza, Chicago, Illinois. It is engaged in the business of supplying electricity to the public in such city and in the northern part of the State of Illinois, and is a public utility subject to the jurisdiction of this Commission.

2. In the course of its electric public utility business, Edison purchases and installs large generating units, the usefulness of which and the cost of energy from which depend on the availability and price of fuel, principally coal and nuclear fuel. Edison is required to and does purchase large quantities of such fuels and is required to and does make forward commitments for the purchase of such fuels for supply to its generating stations.

3. Fossil fuel procurement has become increasingly difficult. The growth of nuclear power has had the effect of making coal mine operators reluctant to open new coal mines in and near Edison's service territory. Restrictions on the use of coal with sulfur contents characteristic of the major reserves in the areas in or near Edison's service territory have had a similar effect. In addition, large quantities of coal reserves in such areas are being acquired by petrochemical and other companies which have potential uses for such reserves other than their exploitation for fuels for electric generating stations.

4. While there is no similar short-run problem in the acquisition of yellowcake, which contains the natural uranium required as the raw material for nuclear fuel, the extent of uranium reserves is uncertain. Indeed, the Atomic Energy Commission has indicated that the reserves recoverable at $8.00 per pound of yellowcake (a price somewhat above the current market) are sufficient to satisfy the demands for such fuel only through about 1979. Edison has purchased sufficient yellowcake, for future delivery, to meet its nuclear fuel requirements through 1975, but now has under consideration the construction of additional nuclear units for which additional supplies of uranium must be arranged.

5. Edison was one of the first companies to enter the field of electric generation with nuclear power. Its Dresden Unit 1, which went into service in 1960, was the first large-scale entirely privately financed nuclear power plant. It has now operated successfully for ten years. Edison has also contracted for more nuclear capacity than any other investor-owned utility. Its 809,000 kilowatt Dresden Unit 2 is now in preparation for commercial operation, which is expected to begin before the summer of 1970. At that time, it will be the largest nuclear unit in commercial service in the United States. Dresden Unit 2 will be followed by Dresden Unit 3 and Quad-Cities Units 1 and 2, each with a capability of 809,000 kilowatts, and Zion Units 1 and 2, each with a capability of 1,100,000 kilowatts. Through extensive experience with the operation of Dresden 1 and its procurement activities for the subsequent units, Edison has developed specialized technological capabilities in the procurement and management of nuclear fuels.

6. A critical factor in the operation of nuclear plants is computer technology. Without highly developed computer skills, it is impossible to operate a nuclear plant; the utilization of such skills has an important effect on the efficiency of fuel management and, consequently, on the cost of power from nuclear

units. Edison's skills in the computer area are highly developed. It was the first utility in the United States to employ a large-scale electronic computer for its billing and for mass accounting operations, and has extended its computer applications to the solution of complex engineering problems in other areas of its business. By reason of its present extensive commitment to nuclear power, it has applied these skills to the problems of nuclear fuel management. A subsidiary to provide computer services both to Edison and to others, primarily utilities, would reinforce Edison's own capabilities and be of advantage to other utilities.

7. A large number of electric utility companies have committed to and over the next several years are expected to commit to the installation of nuclear power plants. In many cases, these companies will not have developed within their own staffs either sufficient skilled specialists or sufficient experience for the most effective management of nuclear enterprises or the application of computers thereto. Many of such companies will be installing their first nuclear units and, since nuclear units are economic only if very large, may operate only a single nuclear unit or a relatively small number for several years. Edison believes that by making available to such companies the advantages of its experience and background in nuclear fuel procurement, nuclear fuel technology and computer applications, it can benefit them while improving at the same time the security of its own fuel supply, its ability to purchase nuclear fuels advantageously, and the utilization of fuel in its own reactors.

8. Accordingly, Edison proposes to establish a subsidiary for the purposes, ancillary to its electric utility business, of:

(a) the acquisition and development of fuel reserves, both nuclear and fossil, capable of providing economical and reliable supplies of fuel for electric generation, the output

from such reserves to be made available to others when consistent with Edison's own requirements, and the conduct of such other fuel supply activities as may be reasonably related thereto;

(b) provision to itself and others of nuclear fuel management services and computer services.

Edison, therefore, requests the consent, authority and approval of this Commission to and for the formation of a subsidiary, all of the capital stock of which would be owned by Edison, and for the investment in such capital stock, without further order of the Commission, of up to $10,000,000.

9. In connection with the establishment of such subsidiary, Edison would propose to transfer thereto, at its cost, certain contractual rights to land with associated coal reserves, the nature and extent of which will be described in the testimony herein. These reserves, however, will not be developed until satisfactory means become available for limiting the sulfur by-products in the stack effluents produced by burning coal of the character contained in the reserves. Since no such means are now available, the subsidiary will initially simply hold and manage such land rights and land acquired for coal reserves without development for coal mining.

10. Also, in the initial stages of the organization and operation of the subsidiary, certain administrative, accounting and other services to the subsidiary will be provided by Edison at the cost to Edison of such services. Such costs to be incurred by Edison and reimbursed by the subsidiary will be limited to $100,000 until further application to the Commission for approval of the terms of any arrangements between Edison and the subsidiary.

11. Transactions other than those transactions above described between Edison and its affiliated interest, the proposed subsidiary, will be presented to the Commission for approval at such times and in the manner required by law.

12. Edison proposes to record its investment in the subsidiary and any profits or losses resulting therefrom in accordance with the Commission's Uniform System of Accounts for public utilities.

WHEREFORE, Edison requests consent, authority and approval of the Commission to form a subsidiary and invest therein as set forth in paragraph (8) above and to engage in transactions with such subsidiary as set forth in paragraphs (9) and (10) above.

Dated this 26th day of March, 1970.

COMMONWEALTH EDISON COMPANY

By /s/ R. J. Schultz

/s/ Isham, Lincoln & Beale

Isham, Lincoln & Beale
One First National Plaza
Chicago, Illinois 60670
786-7500
Attorney for Petitioner

STATE OF ILLINOIS }
COUNTY OF COOK } ss.

I, R. J. Scholtz, first being duly sworn upon oath, depose and say that I am a Vice-President of COMMONWEALTH EDISON COMPANY, an Illinois corporation; that I have read the above and foregoing petition by me subscribed and know the contents thereof; that said contents are true in substance and in fact, except as to those matters stated upon information and belief, and as to those, I believe the same to be true.

R. J. Scholtz

Subscribed and sworn to before me this 26th day of March, 1970.

Notary Public

GOVERNMENT EXHIBIT 200

• • • •

THE UNITED ELECTRIC COAL COMPANIES

Special Meeting of the Board of Directors

October 9, 1959

• • • •

Mr. Morris commented briefly on sales prospects stating that he expects Commonwealth Edison to take additional 350,000 tons per year starting January 1, 1960, and at the same time Central Illinois Light expects to increase purchases by 150,000 tons per year, and Central Illinois Public Service by 100,000 tons per year, a total increase of 600,000 tons per year not including any sales to be made from Banner Mine which will go largely for lake delivery. More storage areas for natural gas are being found and gas companies will also restrict pumping from the well head in order to take advantage of domestic and commercial rates.

No further business appearing, on motion duly made by Mr. Morris, and duly seconded by Mr. Jessopp, the meeting was adjourned.

/s/ G. H. Utterback
Secretary

• • • •

GOVERNMENT EXHIBIT 201

* * * *

THE UNITED ELECTRIC COAL COMPANIES

DIRECTORS' MEETING

May 13, 1960

* * * *

The Chairman brought up for discussion the Company's ownership in McDonough and Schuyler Counties. At July 31, 1959 the Company owned or had contracts to purchase 2,529.10 acres of coal containing an estimated 8,976,117 tons and as of this date these figures have been increased to 3,339 acres of coal containing 11,530,000 tons. Inasmuch as the development of this field is probably some ten years in the future, it was decided not to pursue an aggressive purchasing policy in that area, but only to acquire acreage which might become available at not to exceed normal farm land prices in this area.

* * * *

GOVERNMENT EXHIBIT 210

Information Testimony for
Illinois Commerce Commission Docket #55321

Comments on Fuel Resources and Pollution
in the Power Generation Industry
By Jack A. Simon
2/24/1970

* * * *

Table 1

Reported Uses of Coal Received by Consumers in Illinois
1944 and 1968
(Thousands of Tons)

Use	1944	1968	% Change
Electric utilities	10,242	28,221	+175.5
Coke and gas plants	4,198	3,069	— 26.9
Retail	14,595	3,312	— 77.3
Other[1]	12,941	8,863	— 31.5
Total	41,976	43,465	+ 3.5

[1] Includes general industrial, railroad, and miscellaneous uses.
Source: U. S. Bureau of Mines Coal Distribution Reports.

Q. Will you comment on coal production in Illinois?

A. Illinois in 1969 produced 64,832,584 tons of coal, or about 12 percent of the national total. Exhibit 3a is a map showing the area of Illinois underlain by coal-bearing rocks and locations of mines that were active in December 1969. Exhibit 4a indicates annual coal production in Illinois since 1948, and the steady increase in production during the past 10 years. The 1969 production of coal in Illinois was the largest annual production since 1948, according to data reported by the Illinois Department of Mines and Minerals.

Exhibits 4a, 5a, 6a, 7a, 8a, and 9a present statistical data on Illinois coal and certain relationships to national statistics.

* * * *

Q. Is any part of the Illinois coal with relatively low-sulfur content used for generating electric energy?

A. Yes, although I do not have data on quantity and quality of coal shipments from the mines to specific markets. From the principal low-sulfur coal areas, premium coal for blending for use in metallurgical coke production is now produced at an annual rate of about 4 million tons per year. This coal is prepared from naturally occurring low-sulfur coal, and if some of the coal produced does not meet standards for metallurgical coke production, primarily because of higher ash and sulfur content, it is sold in other markets. This less-than-premium-quality coal is, of course, still relatively low in sulfur content compared with most Illinois coal produced.

A steadily increasing use of Illinois coal in blends to produce metallurgical coke in recent years is one of the reasons for the extensive development of mining activity in the low-sulfur coal area in Franklin and Jefferson Counties, and, on a more modest scale, for some expansion of activity in the relatively low-sulfur coal area in Saline County.

Q. Are there techniques of coal desulfurization other than washing?

A. Yes. The coal can be converted to other fuels with by-product recovery of sulfur. Of greatest long-term interest is the possibility of producing liquid and gaseous fuels from coal. Development of technology to accomplish this conversion is well advanced and pilot-scale plants are now in operation, although no commercial plants have been announced.

A report by H. E. Risser, entitled "Gasification and Liquefaction—Their Potential Impact on Various Aspects of the Coal Industry," was published by the Illinois State Geological Survey as Circular 430

(1968) and is presented as Exhibit 21a. Pertinent information on future projections for coal are present in Exhibit 22a, a report published by the Illinois State Geological Survey as Circular 310 and entitled "Coal in the Future Energy Market," by H. E. Risser (1960).

• • • •

GOVERNMENT
EXHIBIT
219

1967
KEYSTONE
COAL BUYERS MANUAL

A McGraw-Hill Publication

© Copyrighted 1967 McGraw-Hill, Inc.
Printed in U. S. A.

Price $45.00 per copy

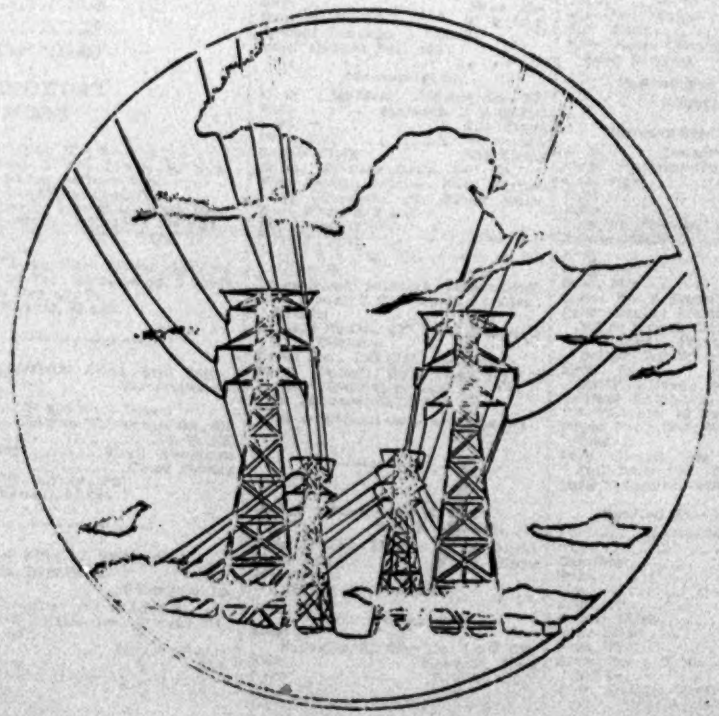
McGraw-Hill Mining Publications
Coal Age—Engineering & Mining Journal—Metals Week
Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

JOHN R. EMERY, Publisher
Mining Publications

ALFRED E. FLOWERS, Editor
Keystone Coal Buyers Manual
Coal Age

GEORGE F. NIELSEN, General Manager
Keystone Coal Buyers Manual
Coal Mine Directory
Monthly News Bulletin Service

McGRAW-HILL, INC.
330 West 42d St., New York, N.Y. 10036



If you are generating electricity, or doing any industrial power or heating job with coal, use a product of the Freeman mines in Illinois . . . for quality and consistently excellent performance. Available reserves aggregate one billion tons. You can be sure of dependable service and security of supply today and for many years to come.

FREEMAN COAL MINING CORPORATION

A DIVISION OF GENERAL DYNAMICS CORPORATION / 307 N. Michigan Ave. • Chicago, Ill. 60601 • ANdover 3-2800

ILLINOIS

DISTRICT 10

RAILROADS SERVING

AT&SF; B&O; CB&Q; C&EI; C&IM; C&NW; CRI&P; G&GE; GM&O; IC; L&N; M&St.L; MoPac; NYC; PRR; SL&OF; TP&W.

1965 TOTAL TONNAGE 58,483,208
1965 UNDERGROUND TONNAGE 25,813,625
1965 STRIP TONNAGE 32,669,583

SIZE OF MINES—1965

500,000 tons and over 37
200,000 to 500,000 13
100,000 to 200,000 5
50,000 to 100,000 6
Less than 50,000 29
(U. S. Bur. Mines)

THIS 1967 ILLINOIS DIRECTORY
29 COMPANIES, 60 MINES

AYRSHIRE COLLIERIES CORP.
430 Big Four Building.
Indianapolis, Ind.
(Affiliated with Thunderbird Collieries Corp.)
Pres. .....Norman E. Kelb
V. Pres. & Exec. Asst. .....Cletus A. Broecker
Vice Pres.-Opns. ....W. A. Endicott
Vice Pres.-Engr. ...D. H. McFadden
Gen. Supt. .....W. H. Hopper
Prep. Mgr. .....J. J. Merle
Pur. Dir. .....Charles B. Parker
Sales Agt., Republic Coal & Coke Co.

Harmattan Mine
P. O. Box 66, Danville, Vermilion Co., Ill.
Ship .....Hillery, NYC RR.
Supt. .....George Wilson
M. Mech .....R. S. Davis
Pit Foreman .....Ralph Westfall
Tipple Fore. .....Clarence Inman
Resident Engr. Jack Lautenschlager
Strip: No. 7 seam, 72" Th.
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: Washery: Crusher: Shaker & Vib. Screns: Ldg. Bins.: Oil Type Dust. Treat.: Heat Driers Freeze-Proof Treat.
Daily Cap. (Cleaned Coal) (1 Shift) ..... 5000 T.
Sizes Washed: Rom (7" x 4"; 4" x 2"; 2" x 1¼"; 1¼" x ¾"; ¾" x ¼"; ¼" x 0)
Sizes Dried: 1¼" x ¼" (Thermal); ¼" x 0 Centrif.
Stoker Sizes: 1¼ x ¼, ¾ x ¼
Mng. Equip.: 2 Drags: 1 Shvl.: 2 Drills: 3 Tracts.
Haulage Equip.: 6 Tractor-Trailer Units
Power Purchased
Property Owned & Leased: Life Expectancy Indefinite: Employees 90: Daily Cap. 500 T.
1966 Tonnage. 777,702

For additional data, see page 427

BARBARA-KAY COAL CO., INC.
P. O. Box 397, Marion, Ill.
Pres. .....James A. Gentry
Vice Pres. .....Leon King
Sales Agent, Southern Illinois Co-Op Coal Sales Co.

Barbara-Kay Mine
(Dist. 10)
P.O. ..Marion, Williamson Co., Ill.
Supt. .....Thomas Horn
Fore. .....Raymond Wilkins
Slope: No. 5 Seam, 48" Th.
Prep. Equip.: Washery, Diester Tbl., Oil Treat., Screns., Pek. Tbls., Ldg. Bins., Mgnts.
Daily Cap. (Cleaned Coal) ....400 T.
Sizes Washed: 1" x ¼, ¼" x ⅛
Sizes Shpd.: 1" x ½, 1" x ¼, ¼" x ⅛
Trade Name: Barbara-Kay
Major Use Value: Domestic
Mng. Equip.: Roof Bltg., Rock Dust., Mng. Mach., Mbl. Ldr., Pit Cars
Haulage Equip.: Shtl. Cars, Locos., 42" T.O.
Pwr. Purch.: Prop. Owned: Life Expec. 10 Yrs.: Employs 30: 1 Shift: Daily Cap. 400 T.
1966 Tonnage. 88,839

BASIN CREAM COAL CO., INC.
Carterville, Ill.

El Sen No. 1 Mine
Loc. ....Herrin, Williamson Co., Ill.
Ship. .....I. C. RR
Mine Mgr. .....Virgil Woodburn
Supt. .....Claud Gentry
Deep: No. 6 Seam, 66"
1965 Tonnage. 57,994

BELL & ZOLLER COAL CO.
208 So. LaSalle St.
Chicago 4, Ill.
(Operates also in Dist. 9)
(Aff. with Zeigler Coal & Coke Co., Dist. 10)
Pres. .....Stuart Colman
Vice Pres. .....M. E. Walsh
Treas.-Sec. & Contr. John R. Cosbey
Ass't. Sec. .....J. O. Hays
Vice Pres. Sales .....Warren P. Wurzburg
Vice Pres. Lake Sales ..S. M. Rogers
Mgr. Sales .....Wm. H. Sutton
Asst. Sec.-Asst. Treas., M. K. Reilly
Operating Office—Johnston City, Ill.
Gen. Supt. .....Arthur Towles
Safety Dir. .....Coy South
Pur. Agt. .....J. C. Davis
Chief Engr. .....Gilbert Engram
Maint. Engr. .....Wm. McNall
Div. Auditor .....John Brannon
Traffic Mgr. .....D. R. Lindstrom
Sls. Agent, Bell & Zoller Coal Co.

Zeigler No. 3 Mine
(Closed 1966)

Zeigler No. 4 Mine
P. O Johnston City, Williamson Co., Ill.
Ship. .....Zeigler Mine, IC, MP & CB & Q & C & EI RRs.
Supt. .....Raymond Gothard
Mine Mgr. .....Guy Robinson
Supply Clerk .....John Aaron
Elecn. .....Charles Crosseman
Prep. Mgr. .....Courtney Bilderback
Slope: No. 6: 96" Th.
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: McNally-Pth. Washery: Deister Tbls.: Thermal Driers: Shkr.: Vib. Screns.: Crusher: Ldg. Bins.: Mgnts.: Oil Dust Treat.: Calcium Freeze Proof
Daily Cap. (Cleaned Coal) (2 Shifts) .....6000 T.
Sizes Washed: 7 x 0
Sizes Dried: 1 x 0
Sizes Shipped: 7" x 3"; 3" x 2"; 2" x 1½"; 1½" x 1"; 1½" x ¼"; 1" x ¼"; 1¼" x 10M; ⅜" x 10M; ¼" x 0
Trade Name: Zeigler Superwashed
Mng. Equip.: 6 MBL. Ldrs.: 8 Cont. Miners: Rock Dust.: 2 Units Roof Bolt, Arctic cascade conv.
Haulage Equip.: Convyrs.: 16 Shuttle Cars
Power Purchased: 3800 KVA D.V. 250 D.C., Tipple 440 A.C.
Prop. Owned: 222 Employees: 2 shifts
1966 Tonnage. 1,073,180

Zeigler No. 9 Mine
Loc. Madisonville, Hopkins Co., Ky.
Ship .....Nebo, Ky.
Originating RR .....IC & L&N
Annual Tonnage. 1,750,000
Note: Opened Fall. 1967

Murdock Mine
P. O ...Murdock, Douglas Co., Ill.
Ship .....Murdock, B & O RR.
Supt. .....Bill Urton
Prep. Mgr. .....K. W. Neibch
Supply Clerk .....Roy Bauer
Shaft: Murdock Seam, 84" Th.
Prep. Equip.: Crusher: Shkr. Screns.: Jig Washery: Oil Spray Dust.
Sizes Washed: 6 x 0
Sizes Dried: 1" x 0
Sizes Shipped: Over 6", over 3", 6 x 1½, 3 x 1½, 1½ x 0: 1 x ¼: 1½ x ¼
Trade Name: Murdock Superwashed
Mng. Equip.: 2 Cut. Machs.: 4 Ldrs.: 3 Drills
Haulage Equip.: 42" T.O.: 3 Shuttle Cars: Convyrs.
Power Pur., 250 D.C., 440 A.C.
Prop. Owned: Employees 114: 2 shifts: Daily Cap. 3,300 T.
1966 Tonnage. 653,624

For additional data, see page 416

BELLE VALLEY COAL CO.
R.D. 1, Belleville, Ill.
Pres. & Gen. Mgr. ... C. O. Stiehl
Chief Engr. .....H. W. Flood
Sales Agts.:
Schleifer & Associates

Belle Valley Mine
Ship.
Belleville, St. Clair Co., L&N. RR.
Supt .....Kenneth Wall
Elecn. .....Roland Plab
Chief Clerk .....C. R. Deetsch
Top Foreman .....Edward Williamson
Prep. Mgr. .....Harry Niedemuller
Designer of Plant: Wemco
Prep. Equip.: WKE Heavy Media Washery: Crusher: Screens
Daily Cap. (Cleaned Coal) ...600 T.
Sizes: 4 x 0: 2 x ⅜: 1¼ x ⅜: ⅜ x 3/16
Equip.: Ldg. Mach: 4 Tr. Loco: T.O. 42": 16-5 ton steel cars
Power Pur.: D.V. 250 D.C.
Employees 46: 2 shifts: Life Expec 10 yrs.: Daily Cap. 500 T.

BIG MUDDY COAL CO.
P.O. Box 238, De Soto, Ill.

Big Muddy Mine
Loc. .....De Soto, Jackson Co., Ill.
Ship .....I.C. RR
Supt. .....Eugene Farley
Strip.: No. 6 Seam, 108" Th.
1965 Tonnage. 319,165

BLUE BIRD COAL CO.
234 So. Michigan Ave.,
Chicago, Ill.
Pres. .....Richard E. Cochran
Sales Agt. .Ender Coal & Coke Co.

Turner Mine
P. O. ....Harrisburg, Saline Co., Ill.
Ship .....Harrisburg: NYC RR.
Pur. Agt. .....H. Hess
Slope: No. 5 Seam: 54" Th.
Prep. Equip.: Deister Tbls.: Vib. & Shkr. Screns.: Pek. Tbls.: Ldg. Bins.
Sizes Washed: 1¼ x 10M: 1" x 10M: ¾ x 10M

CONSOLIDATION COAL CO., TRUAX-TRAER COAL CO. DIV.
111 No. Wabash Ave.,
Chicago, Ill. 60602
(See also N. D.)
Pres. .....Melville H. Ireland
Vice Pres. (Oper.) .....Wm. E. Hall
Treas. .....S. N. Zagaria
Vice Pres. (Sales) ....B. E. Herbster
Chf. Engr. .....M. H. Shumate
Sales Agts., Consolidation Coal Co., Sales Division

Burning Star No. 1 Mine
(closed 1966)

Burning Star No. 2 Mine
P. O. .....DuQuoin, Perry Co., Ill.
Ship. Pinckneyville, IC & MP RRs.
Gen. Mgr. .....R. E. Henderson
Supt. .....Laddie Green
Engr. .....K. V. Stewart
Prep Plt. Foreman John E. Robinson
Supply Clerk .....Neil Rice
Elec. .....H. M. Richart
M. Mech .....H. L. Singer
Prep. Mgr. .....J. L. Dress
Strip: No. 6 seam: 60" to 66" Th.
Prep. Equip.: McNally Wash.: Rot. Brkr.: Raw & Clean Coal Storage: Oil Dust. Treat.: Vissac Heat Driers: CMI Driers
Mng. Equip.: 1 Strp. & 1 Ldg. Shvls.: 2 Ovbdn. Drills
Haulage Equip.: 18 Tractor-Trailer 6 Tractors: 12 Pumps
Power Pur.: Dist. Volt. A.C. 34,500/7200/400
Prop. Owned: Life Expec. 20 yrs.: Full Daily Cap. 6800 T.: 1 shift
1966 Tonnage. 1,464,000

Burning Star No. 3 Mine
P.O. .....Sparta, Randolph Co., Ill.
Ship .....Sparta, MI RR
Gen. Mgr. .....R. E. Henderson
Supt. .....H. M. Clark
Elec. .....J. Jenkins
Engr. .....K. V. Stewart
Supply Clerk .....A. Campanella
Mine Mech. .....H. L. Singer
Prep. Mgr. .....J. L. Dress
Strip: No. 5 & No. 6 Seams, 54" & 66" Th.
Prep. Equip.: McNally Wash. Rot. Brkr.: Raw & Clean Coal Storage: Oil Dust. Treat. CMI Driers. Rapid Loading
Mng. Equip.: 1 Strp. & 2 Ldg. Shvls., 1 Drag., 2 Ovbdn. Drills
Haulage Equip.: 6 Tractor-Truck Units
Pwr. Purch.: 34,500-6,900-440 AC: Prop. Owned: 3 Shifts: Daily Cap. 6,000 T.
1966 Tonnage. 1,378,000

Hillsboro Mine
P. O. ..Coffeen, Montgomery Co., Ill.
Supt. .....M. V. Harrell
Asst. Supt. .....R. O. Rouse
Mine Mgr. .....Earl Caveney
Engr. .....R. Rentz
Supply Clerk .....Mrs. Skinn
Elec. .....S. Lanham
Shaft: No. 6 Seam, 66" to 72" Th.
Prep.: Raw. Brkr. 1½ x 0
Mng. Equip.: Contin. Mnrs.
Haulage Equip.: Shtl. Cars, Belts
Prop. Owned: Daily Cap. 3,800 T.
1966 Tonnage. 1,017,000

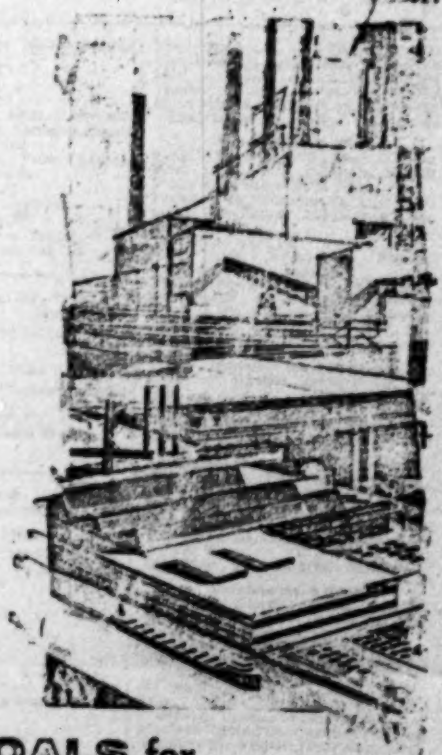
Red Ember Mine
P. O. .....Platt, Fulton Co., Ill.
Ship .....Platt, CB&Q RR.
Gen. Mgr. .....J. G. Berta
Engr. .....L. Fisher
Mech. Supt. .....L. W. West
M. Mech. .....Elmer McCann
Prep. Engr. .....J. L. Dress
Supply Clerk .....Lyle Boughan
Stripping: No. 5 seam: 84" Th.

BY BARGE on the Inland Waterways

BY LAKE VESSEL to Great Lakes Ports

BY RAIL to all Middle West Points

BY TRUCK for Local Area Delivery



UNITED ELECTRIC COALS for ELECTRIC UTILITIES and BASIC INDUSTRIES

BANNER– Direct Barge-Loading Coal Mine.
Premium quality heavy media washed coal.
Banner Seam, Peoria County, Illinois

CUBA-BUCKHEART
Heavy media, washed and heat dried coals.
Fulton County, Illinois, No. 5 Seam.

FIDELITY
Washed and heat dried coals.
Perry County, Illinois, No. 6 Seam.

THE UNITED ELECTRIC COAL COMPANIES
A SUBSIDIARY OF GENERAL DYNAMICS CORPORATION/ 307 N. Michigan Ave. • Chicago, Ill. 60601 • CEntral 6-6565

Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: Norton washery; oil dustless treatment; Crusher; Vib. & Shkr. Screens; Ldg. Bms.; Mgnts.; Vissac Driers; CMI Driers
Cap. (Cleaned Coal)...7500 T
Washed: 6" x 0
...Dried: 1" x 0
Sizes Made: 6" x 4"; 4" x 2"; 2" x 1"; 1" x 0
Mng. Equip.: 2 Strp. & 3 Ldg. Shvls.; 1 Drag.; 2 Wh. Excav.
Haulage Equip.: 17 Trucks, 8 Tractr.
Power Pur.: Dist. Volt 34,500/4160 440 A.C.
Prop. owned & leased: Life Expectancy 20 yrs.: 1 shift: 7500 T. daily
1966 Tonnage, 1,604,000

Little Sister Mine

P. O. St. David, Fulton Co., Ill.
Ship St. David, CB&Q RR.
Gen. Mgr.....J. Q. Berta
Supt. .....Carl Bowlin
Engr.....L. Fisher
Prep. Mgr.....J. L. Dress
Supply Clerk.....J. M. Mullen
Elec .....P. Brita
Strip: No. 5 seam: 50" Thick
Designer of Plant: Link-Belt Co.
Prep. Equip.: Link Belt washery; Crusher, Vib. and Shaker Screens; Loading Booms; Cent. Drier; Oil Freeze Proof
Daily Cap. (Cleaned Coal) ..4,500 T.
Sizes Washed: 6" x 0
Sizes Made: ¾" Scr.; 1¼" Scrs.: ¾" x 3/16"; 1¼" x ¾"; 4" x 1¼"; 8" x 4"
Mng. Equip.: 2 Strp. & 2 Ldg. shovels; drills; Dragline; wheel excav.
Haulage Equip.: 14 Trucks; 7 Tractrs.; 17 Pumps
Power Purchased: D.V. 440-4000 A.C.; 6,500,000 kwh. used annually
Prod. owned & leased: 3 shifts; 4500 T. daily cap.
1966 Tonnage, 983,000

For additional data, see pages 27, 57, 132, 143, 209, 267, 419, 437, 468, 487, 496, 497, 536, 537, 548, 549, 583

EDEN MINING CORP.
Sparta, Ill.

Eden Mine

Loc. .....Randolph Co., Ill.
Ship .....C M & O RR
Strip: No. 6 Seam: 57" Th.
Employs 22
1965 Tonnage, 166,908

FARLEY BROS. COAL CO.
De Soto, Ill.

Black Dot #2 Mine

Loc. .....Jackson Co., Ill.
Ship .....I. C. RR
Strip: No. 5 Seam: 42" Th.
Employs 16
1965 Tonnage, 48,470

FREEMAN COAL MINING CORP.
A Division of General Dynamics Corp.
307 N. Michigan Ave.
Chicago, Ill. 60601
Pres.....Frank Nugent
Exec. Vice Pres.....N. T. Camicia
Vice Pres.....Barton R. Gebhart
Sec.....J. F. McGuire
Treas .....M. J. Propst
Compt. .....J. McMurtrey
Sls. Mgr. .....Gary A. Roberts
Dir. Pur.....Norman P. Sylvebeck
Sls. Agt., Freeman Coal Mining Corp.

Operations Office:
West Frankfort, Ill.

Gen. Mgr. of Mines
Harry Williamson, Jr.
Gr st.....Buddy Morris
Fr ter.....Jack Matheson, Jr.
Chf. ...er.....Thomas L. Garwood
Project Engr.....Wm. H. Mullins
Safety Dir.....Paul M. Budzak
Maint. Supt.....E. C. Willis
Proj. Engr.....Chas. Jankousky
Prep. Engr. .....Arduino Castrale
Elect. Engr. .....Francis Harmon
Underg. Mech. Engr. Lloyd H. Saylor
Const. Engr.....R. R. Steinriede
Traffic Mgr.....Carroll A. Clem
Workm. Comp. Supr.
Raymond Wyant
Employment Supr.
Harry Treadwell, II
Supply Supvr. ....Emory Smothers

Crown Mine

P. O.....Farmersville, Montgomery Co., Ill.
Ship.....Crown, I.C. R.R.
Supt.....Bernard Burke
Mine Mgr.....John Carney
Shaft: No. 6 seam: 84" Th.
Designer of Plant: Roberts & Schaefer Co.
Prep. Equip.: Jeffrey Jigs, Crushers, Air Flow Cleaners; Dryers; Screens, etc.; Oil Type Dust. Treat.
Daily Cap. (Cleaned Coal) (2 Shifts) 10,000 T.
Major Use Values: Dom.; Indus.; Utility
Trade Name: Crown
Sizes Washed: 6" x 1½"
Sizes Air Cleaned: 1½" to 0
Sizes Dried: 5/16" x 0
Mng. Equip.: Cutt. Machs.; Mbl. Ldrs.; Drills; Rock Dusters; Roof Bolting
Haulage Equip.: Main Line & Panel Belts; Shuttle Cars; Batt. & Trolley Locos
Power Pur.: 250 D.C., 440 A.C.
Daily Capacity 10,000 T; 2 Shifts
1966 Tonnage, 2,284,378

Orient No. 2 Mine

P. O. Waltonville, Jefferson Co., Ill.
Ship. Orient 2 CB & Q; MP; IC RRs.
Supt .....Howard L. Schuls
Mine Mgr.....Virgil Robinson
Slope: No. 6 Seam: 108" Th.
Designer of Plant: Allen & Garcia Co.
Prep. Equip.: Jeffrey Jigs; Nelson L. Davis Heavy Media; Heavy Media Cycle.; Stump Airflow Cleaners; Mgnts; Vib. & Shkr. Screns.; Ldg. Bms.; Crshrs.; Oil Treat.; Freeze Proof
Daily Cap. (Cleaned Coal) (2 Shifts).....14,000 T.
Sizes Washed: 6" x 10 mesh
Sizes Air Cleaned: 7/16" x 0
Sizes Made: 2", 1½", ¾" & 7/16" x 0; 48, 28, 10M, 6" x 3" 3" x 2" 2" x 1½", 1¼" x ¾", ¾" x 7/16"; M/R. Comb. of above
Trade Names: Orient Airflow Stoker Orient Supertherm; Bantam Stoker
Major Use Values: Domestic; Industrial; Metallurgical; Utility
Mng. Equip.: MSA Rock Dust.; Roof Bolt.; Continuous Miners; Pumps
Haulage Equip.: Batt. Locos; Shuttle Cars; Main Line & Panel Belts
Power Pur.: 250 D.C., Tipple 440 A.C.
2 shifts; Daily Capacity 14,000 T.
1966 Tonnage, 2,767,635

Orient No. 4 Mine

P. O. Marion, Williamson Co., Ill
Ship..Orient 4, I.C., C&EI, Mo. Pac. RRs.
Supt.....Van E. Austin
Mine Mgr.....Ben Kincer
Slope: No. 6 Seam: 108" Th.
Designer of Plant: Roberts & Schaefer Co.
Prep. Equip.: Crshrs.; Heavy Media Vessels; Jeffrey Jigs; Air Flow Cleaners; Fine Coal Dryer; Oil Type Freeze-Proof & Dust. Treats.
Daily Cap. (Cleaned Coal) (2 Shifts) 7000 T.
Major Use Values: Util.; Indus.; Com.; Dom.
Trade Names: Freeburn Stoker; Freeman; Orient
Sizes Washed: 6" x ¼"
Sizes Air Cleaned: ¼" x 0"
Mng. Equip: Cantin. Mnrs.; Rock Dusters; Roof Bolting
Haulage Equip.: Main Line & Panel Belts; Shuttle Cars; Batt. & Trolley Locos
Power Pur.: 250 D.C., 440 A.C.
Two shifts; Daily Cap. 7000 T.
1966 Tonnage, 1,112,000

Orient No. 5 Mine

P. O.
West Frankfort, Franklin Co., Ill.
Ship.....West Frankfort, IC, MP, C&EI & CB&Q RR's
Supt.....John Turyn, Jr.
Mine Mgr.....Chas. Renshaw
Shaft: No. 6 seam: 108" Th.
Designer of Plt.: McNally-Pgh.
Prep. Equip.: Heavy Media Vessels; Deister Tbls.; Cent. Dryers; Heat Dryers; Oil Treat.; Freeze Proof
Daily Cap. (Cleaned Coal) (2 shifts) 7,000 T.
Major Use Values: Util.; Indus.; Com.; Dom.
Trade Name: Orient
Sizes Washed: 3½" x 0
Sizes Made: 0 to 3½"
Mng. Equip.: Cont. Miners; Shuttle Cars; Roof Drills; Cutters; Ldrs.; Coal Drills; Longwall
Haulage Equip.: M. Cars; Locos.; Panel & Room Belts
Pwr.: 250 D.C. 440 A.C.
Daily Cap. 10,000 T.; 3 shifts
1966 Tonnage, 1,541,997

For additional data, see pages 49, 423

HARRISBURG COAL CO., INC.
Marion, Ill.
Sales Agents, Southern Illinois Co-op Coal Sales Co.

Harrisburg Mine

Loc. .....Williamson Co., Ill.
Ship .....NYC RR
Slope; No. 5 Seam: 80" Th.
Prep Equip: Dyster Table Washer
Employs 25

HAZEL DELL COAL CO.
New Windsor, Ill.

Hazel Dell Mine

Loc. .....Mercer Co., Ill.
Ship .....C B & Q RR
Shaft; No. 1 Seam: 54"
Employs 19
1966 Tonnage, 23,685

LIBERTY COAL CO.
Crab Orchard, Ill.
Pres.....Bert Chamness
Sales Agents, Southern Illinois Co-op Coal Sales Co.

Liberty Mine

P.O.....Crab Orchard Williamson Co., Ill.
Ship.....Marion, C&EI RR
Strip; No. 6 Seam, 105" Th.
Supt.....Jack McCoy
Trade Name: Liberty
Major Use Values: Industry & Electric Coops.
Sss. Shpd.: 1¼" x 0
Mng. Equip.: Ldg. Shvl., Bldrs., Drags., Ovbdn. Drills
Haulage Equip.: Conveyor, Tractor-Trailers
Prop. Leased; Life Expec. 2 Yrs.; Employs 30; 1 Shift; Daily Cap. 1,800 T.
1965 Tonnage, 300,000

LITTLE DOG COAL CO.
1734 Railway Exchange Bldg.,
611 Olive St., St. Louis Mo. 63101
Pres.....C. V. Beck
Sec .....C. V. Beck, Jr.
Gen. Supt. .....Joe Henderson
Sales Agts., Clarence V. Beck & Co.

Little Dog Mine

P. O. Gillespie, Macoupin Co., Ill.
Ship .....Gillespie, IT RR.
Prop. Mgr.....C. Harris
Deep; No. 6 seam: 84" Th.
Prep. Equip.: Jeffrey Washer; 4 Deister Tbls.; Shkr. Screns.; Pckg. Tbls.; Ldg. Bms.; Oil Dust. Treat.; 3 Crushers; Salt & $CaCl_2$ Type Freeze-Proof Treats.
Daily Cap. (Cleaned Coal) (2 Shifts).....3000 T.
Trade Name: Little Dog Coal
Major Use Values: Steam; Domestic
Sizes Washed: 7" Down
Sizes Shipped: 7" Lo., 7 x 3, 3 x 2, 2 x 1¼, 1¼ x ¾, ¾ x 10M.; 1¼" Washed or Dry Screns.
Tonnage Cleaned, 1966 447,564
Mng. Equip.: 6 Cutting machs.; 8 Mbl. Ldrs.; 6 Coal Drills; 1 Pump; Rock Dust.
Haulage Equip.: 6 Tr. Locos; 9 Shuttle Cars; 500 M. Cars; 36" T.G.
Power Pur.: 2500 HP; DV, D.C.; Tipple, A.C.
Prop. Owned; Life Expec. 30 yrs.; Employees 170; Daily Cap. 3700 T.; 2 shifts
1966 Tonnage, 447,564

LITTLE SISTER COAL CORP.
(See Consolidation Coal Co., Truax-Traer Coal Co. Div.)

MAINLINE COAL CO.
DeSoto, Ill.
Pres.....Eugene Farley
Vice Pres.....Ed Farley, Sr.
Vice Pres.....Kenneth V. Storme
Secr.....J. Wes Gentry
Treas.....Gary E. Spiller
Sales Agents, Southern Illinois Co-op Coal Sales Co.; Royal Peat Corp.

Mainline No. 1 Mine

P. O...Cambria, Williamson Co., Ill.
Ship.....Cambria, IC RR
Strip; No. 6 Seam, 102" Th.
Trade Name: Mainline No. 1
Major Use Values: Industry & Electric Coop.
Sss. Shpd.: 1¼" x 0
Mng. Equip.: Ldg. Shvl., Bldrs., Ovbdn. Drill, Draglines
Haulage Equip.: Convyr., 10 Trucks
Pwr. Purch.; Prop. Leased; Life Expec. 8 Yrs.; Employs 39; 2 Shifts; Daily Cap. 4,300 T.
Note: New 1966

Mainline No. 2 Mine

P.O.....Elkville, Jackson Co., Ill.
Ship.....DeSoto, IC RR
Strip; No. 6 Seam, 86" Th.
Trade Names: Mainline No. 2 & Elk
Major Use Values: Industry & Electric Coop.
Sss. Shpd.: 1¼" x 0
Mng. Equip.: Ldg. Shvl., Bldrs., Drags., Ovbdn. Drill
Haulage Equip.: Conveyor, 15 Trucks
Prop. Leased; Life Expec. 8 Yrs.; Employs 26; 1 Shift; Daily Cap. 1,200 T.
1966 Tonnage (3 Months), 56,800

Mainline No. 3 Mine

P. O.....Dowell, Jackson Co., Ill.
Ship.....Dowell, IC RR
Strip; No. 6 Seam, 78" Th.
Trade Name: Mainline
Major Use Values: Industry & Electric Coops.
Sss. Shpd.: 1¼" x 0
Mng. Equip.: Tracts., Ldg. Shvl., Bldrs., Drags., Ovbdn. Drills
Haulage Equip.: Conveyor, 10 Trucks
Employs 27; 1 Shift; Daily Cap. 2,000 T.
Note: New 1966

MARSHALL EQUIPMENT CO.
Harrisburg, Ill.

Mary Ann Mine

Loc. .....Saline Co., Ill.
Ship .....NYC RR
Strip; No. 5 Seam: 48" Th.
Employs 15
1966 Tonnage, 134,426

NEW GALLATIN COAL CO.
P. O. Box 411, Harrisburg, Ill.
Gen. Supt. .....Theron Simmons
Sales Agents, Southern Illinois Co-op Coal Sales Co.

Nos. 1 & 2 Mines

P.O. ....Harrisburg, Saline Co., Ill.
Ship. .....NYC RR
Drift: No. 6 Seam, 62" Th.
1965 Tonnage, 328,765

New Oak Hill No. 6 Mine

P.O. ....Harrisburg, Saline Co., Ill.
Ship. .....NYC RR
Strip; No. 5 Seam, 54" Th.

OLD BEN COAL CORP.
10 South Riverside Plaza,
Chicago, Ill. 60606
[Wholly Owned Subsidiary, Coal Processing Corp. (Va.); Enos Coal Corp. (Ind.)]
Chm. of Bd. .....D. W. Buchanan
Pres .....D. W. Buchanan, Jr.
Sr. Vice Pres.....R. B. Starek
V. Pres. Sales .....D. P. Buchanan
V. Pres. Sales .....R. E. Exum, Jr.
Asst. Vice Pres. Sales ..W. J. Darst
Asst Vice Pres. Sales Robert Mackay
Sec. & Gen. Counsel
Bushnell Fullerton
Treas.....T. L. Bstrup
Contr.....J. E. Anderson
Operating Office: Benton, Ill.
Vice Pres.....Geo. A. Strunck
Vice Pres.....J. W. MacDonald
Gen. Mgr. Mines.....R. T. Moroni
Chief Engr.....Cesli C. Bellis
Asst Mgrs. of Mines
O. D. McDaniel; A. J. Webster
Mgr. Ind. Engrng.....John Janes
Chf. Elec. Engr.....Hallis Pierce
Mgr., Purchases & Stores
T. B. Sadler
Dir. of Safety .....W. D. Fraley
Shaft Supt.....J. E. MacDonald
Sales Agt., Old Ben Coal Corp.

Foreman.....Jess Black
Mines Supplying Raw Coal: Sahara Nos. 5, 6 & 16
Designer of Plant: McNally-Pittsburg Mfg. Co. & Roberts & Schaefer
Prep. Equip.: Rotary breaker; Baum washery; Oil Dust. Treat.; Crushers; Vib. Shkr. & Rar Screns.; Ldg. Bins.; Vissac Driers; Heat Drying Freeze Proof. Diester tble.
Daily Cap. (Cleaned Coal)(2 shifts) 10,000 T
Sizes Washed: 7" x 0
Sizes Dried: 1½" x 28M & Interm.
Sizes Dried: 1" x 28M & Interm.
Trade Name: Sahara
Major Use Values: Domestic: Steam: Metallurgical
Sizes Shipped: 7 x 4; 4 x 2; 3 x 2; 2 x 1½; 1½ x 1; 1 x ⅝; 1½, 1" & ¾" x 28M; 1½, 1 & ⅝ x 10M
Life Expec. 25 yrs.; Employs. 33
1966 Tonnage. 2,634,639

Sahara No. 5 Mine

P. O . . Harrisburg, Saline Co., Ill.
Ship....Harrisburg, NYC & IC RRs.
Mine Supt.....Tom Goldman
Mine Elec .....A. W. Lanham
Foreman .....Harold Hancock
Slope: No. 5: 56 to 66° Th.
Prepared at Central Prep. Plant
Mng. Equip.: mbl. ldrs.; mtd. cut. mach.; coal drls.; port. rock dust., holters; pumps
Haulage Equip.: shuttle cars; conveyrs.; mine cars; loco.; 42" T.G.
Power Pur.: 1000 KVA.; D.V. Mine 275 D.C., Tipple 440 A.C.
Property Owned: Life Expec. 30 yrs.; Employees 220; 2 shifts; 3500 T. daily
1966 Tonnage. 796,472

Sahara No. 6 Mine

P. O . . Harrisburg, Saline Co., Ill.
Ship....Harrisburg, NYC & IC RRs.
Mine Supt.....O. B. Wiley
Mine Elec ..... P. Wallace
Foreman ..... T. D. Ewell
Strip: No. 6: 60" Th.
Prepared at Central Prep. Plant
Mng. Equip.: 1 Stripping & 1 Ldg. Shvl.; 1 Drag., 3 Ovrbdn. Drills
Haulage Equip.: 8 Tractor-Trailer Units
...er Pur.: 2000 KVA.; D.V. Mine 160 A.C., Tipple 440 A.C.
...op. Owned: Life Expec. 30 yrs.; Employees 183; 1 shift; 5,000-5,500 T. daily.
1966 Tonnage. 1,024,185

Sahara No. 16 Mine

P. O Harrisburg, Saline Co., Ill.
Ship....Harrisburg, NYC & IC RRs.
Mine Supt.....Chas. Boyd
Mine Elecn.....Glen Lane
Foreman.....John Lane
Slope: No. 5: 60 to 72" Th.
Prepared at Central Prep. Plant
Mng. Equip.: Cutting Machs.; Mbl. Ldrs.; Coal Drills; Port. Rock Dust.; Pumps
Haulage Equip.: Belt Convyrs.; 42" T.G.; Shuttle Cars
Power Pur.: 1500 KVA.; D.V. Mine 275 D.C., Tipple 440 A.C.
Prop. Owned: Life Expec. 25 yrs.; Employees 150; 2 shifts; 3,500-4,500 T. daily.
1966 Tonnage. 1,014,182
For additional data, see page 425

SOUTHWESTERN ILLINOIS COAL CORP.
1814 Merchants Bank Bldg., Indianapolis, Ind.
Pres ..... Chester Jackson
V. Pres ..... T. C. Mullins, Jr., 301 Memorial Drive, St. Louis, Mo.
Sec., Treas. & Gen. Mgr. ..... R. D. Screen
Sales Agt., Peabody Coal Co.

Streamline Mine

P. O Percy, Randolph Co., Ill.
Ship Percy, GM&O, MP RR.
Mine Supt.....R. L. Hays
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: Norton Washery
Daily Cap. (Cleaned Coal)...4200 T
Sizes Washed: 6" Down
Size No. 6: 72" Th.
Mng. Equip.: 1 stripping shovel; 2 draglines; 1 loading shovel; 1 overburden drill
Haulage Equip.: 6 Trect-Trails.
Power Purchased
Prop. Owned: Life Expec. 15 Yrs.; Employees 118; 3 shifts; Daily Cap. 4000 T.
1966 Tonnage. 1,560,390

Captain Mine

P.O.....Percy, Randolph Co., Ill.
Ship..Percy, GM&O RR; Unit Train
Supt.....Dale Walker
Pit Fore.....Don McCaw
Drill Fore.....Orval Rushing
Second Shift Fore.....Dick Green
Chf. Engr.....Don Hays
Chf. Elec.....John Coon
Mine Elec.....Chas. Crawford
Prep. Plt. Fore.....James Burris
Strip: No. 5 & No. 6 Seams, 60" & 72" Th.
Designer of Plant: McNally Pittsburg Mfg. Co.
Prep. Equip.: Washer, Cyclones, Crshrs., Brkrs., Thermal Driers, Coal Storage & Reclaiming
Scs. Made, 3"x0, 6"x0
Mng. Equip.: Strp. & Ldg. Shvls., Drills, Belt Convyrs., Draglines
Haulage Equip.: 8 Tract-Trails.
Pwr. Purchased
1966 Tonnage. 5,196,407
For additional data, see pages 69, 237, 362, 414, 431, 453, 473

STONEFORT COAL MINING CO., INC.
2620 N. Meridian St., Indianapolis, Ind. 46208

Will Scarlet Mine

P. O..... R.R. #2, Stonefort, Williamson Co., Illinois
Ship ....Stonefort, NYC & IC RR
Supt.....Frank Gilbert
Asst. Supt.....Dora Sims
Prod. Mgr.....E. L. King
Chief Elect.....H. Davis
Strip: Davis-Dekoven, 36"
Prep. Mgr.....H. D. Yocum
Designer of Plant: Self-designed
Prep. Equip.: Baum Jigs, Crushers, Baughman Verti-Vane Dryer, Oil Treat.; Heat Driers Freeze-proof Treat.
Daily Cap. (Cleaned Coal) (2 shift).. 6,500 T.
Scs. Washed: 4 x 1¼", 1¼ x 1", 1 x 10M, 1½ x 10M
Scs. Dried: 1 x 0"
Sizes Made: Egg, Nut, Scrg., Stoker
Trade Name: Stonefort
Mng. Equip.: 1 shovel, 3 loading shovels; 2 drags.
Haulage Equip.: 11 Trucks, 5 tractors
Power: 60,000 V. DV. 4000 A.C., 400 A.C.
Prop. Leased & Owned: Life Exp. 30 yrs.; Employees 140; 2 Shifts; Daily Cap. 3000 T.
1966 Tonnage. 1,133,518

Allendale Mine

Sls. Agt., Pittsburg & Midway Coal Mining Co.
Loc.....Wyoming, Stark Co., Ill.
Ship.....Sherwood, CB & Q, C & NW RR's.
Supt.....R. W. Edwards
Chf. Elec.....T. E. Davis
Strip: No. 6 Seam: 42" Th.
Prep. Equip.: Baum Wash.; Driers; Ldg. Bins.
Daily Cap. (Cleaned Coal)....2600 T.
Sizes Washed: All
Sizes Dried: ¾" x 0
Sizes Shpd.: 4" x 1¼"; 2" x 1¼"; 1¼" x ¾"; ¾" x ¼"; ¼" x 0"
Major Use Values: Dom. & Steam
Mng. Equip.: Strp. Shvl.; 2 Ldg. Shvls.; 4 Dsrs.; 1 Drag
Haulage Equip.: 6 Trks.
Power—33,000 V AC
Prop. Owned & Leased: Life Expec. 20 yrs.; Employs. 60; Daily Cap. 2600 T.
1966 Tonnage. 590,374
For additional data, see pages 455, 861

THUNDERBIRD COLLIERIES CORP.
106 S. Meridian St., Indianapolis 25, Ind.
(Operates also in District No. 11)
(Subsidiary of Ayrshire Collieries Corp.)
Pres.....Norman B. Kalb
Vice Pres. & Exec. Asst. ..... Cletus A. Broecker
Vice Pres. Oprs. ....W. A. Endicott
Vice Pres. Engrs. ..D. H. McFadden
Gen. Supt. .....W. H. Hopper
Prep. Mgr.....J. J. Merle
Pur. Dir.....Charles B. Parker
Sls. Agt., Republic Coal & Coke Co.

Delta Mine

P. O. Marion, Williamson Co., Ill.
Ship: ....Delta, IC RR. & Harrisburg, N. Y. C. RR.
Supt.....Maurice Williams
Pit.....Wm. A. Absher
M. Mech.....Elwood Smith
Tipple Fore .....Quinn Neely
Res. Mgr.....Geo. Hargraves
Designer of Plant: McNally-Pgh. Mfg. Co.
Strip: No. 6 seam: 60" Th.
Prep. Equip.: 1 Link-Belt & 1 McNally Norton washery; Crushers; Vib. & Shkr. Screens; Picking Table; Loading Booms; 3 Driers; Oil Type Dust. Treat.; Heat Driers Freeze-Proof Treat.
Daily Cap. (Cleaned Coal) (1 Shift).....4000 T.
Sizes Washed: Rom.: 7" x 4"; 4" x 2"; 2" x 1¼"; 1¼" x ¾"; ¾" x 10M; ¼" x 0
Sizes Made: Lump; Egg; Nut; Pea; Stove
Mng. Equip.: 1 Power Shovels; 2 Dragline; 2 Tractors; 2 Overburden Drills; 2 Coal Drills
Haulage Equip.: 11 Tractors; 11 Trailer units
Prop. owned; Life expectancy Indef.; 90 Employees; Daily Cap. 4000 T.
1966 Tonnage. 767,442

Sun Spot Mine

P. O.....Vermont, Fulton Cty., Ill.
Supt.....Clyde Dallas
Res. Engr.....Wm. Smith
Pit. Fore.....George Martin
Chief Elect.....John Shaw
Master Mech.....Willard Corun
Prep. Plant Fore.....Chappell Scott
Ship.....Vermont, CB & Q RR; Ill. River Mile 90.75
Strip: Ill. #2, 28" Th.
Prep. Equip.: Heavy Media Washer, Therm. Dryrs; Cent. Dryrs; Double Screen, Oil Treat.
Sizes Washed: 6 x 0
Sizes dried: 1½ x ⅛ mm.
Daily Cap. Clean Coal 3500 T.
Trade name: Vermont
Maj. use: Steam & Ind.
Sizes Shipped: 6 x 4, 4 x 1¼, 1¼ x ⅝, ⅝ x ⅛, ⅛ x 28, Ind. stoker
Mng. Equip.: 1 strip shvl.; 1 dragline; 1 ldg. shvl.; 3 tractors; Power purchased; 60,000 V. AC; prop. leased
Haulage equip.: 8 Tractor Trailers Employs 62; Life Expec.; Indef. 1 shift; Daily Cap. 3500 T.
1966 Tonnage. 761,601
For additional data, see page 427

UNITED ELECTRIC COAL COMPANIES, THE
307 N. Michigan Ave., Chicago, Ill. 60601
(A Subsidiary of General Dynamics Corp.)
Pres.....Frank Nugent
Sr. Vice Pres. .....R. H. Inman
Vice Pres. (Western Div.) T. J. Tarsy
Vice Pres. (Finance) H. K. Pedersen
Sec. & Treas. .....John T. Murray
Asst. Sec.....J. P. McGuire
Asst. Sec.....A. R. Finberg
Sales Mgr .....E. C. Butler
Dir. of Purch. & Maint. Wm. A. Patty
Prep. Mgr.....D. H. Burkhalter Canton, Ill.
Land Engr .. T. H. Latimer
Chf. Design & Equip. Engr. P. E. Smartin
1966 Company Production, 5,854,936 Tons
Sales Agt., United Electric Coal Cos.

Buckheart Mine No. 17

P. O.... Canton, Fulton Co., Ill.
Ship... Canton, CB & Q RR. & Ill. River
Supt. .....C. E. Bond
Asst. Supt. .....Davis Campbell
Elecn. .....L. O. Kroell
M. Mech.....M. Rennie
Pit Foreman .....E. H. Shields
Plant Foreman .....J. R. Stull
Strip: No. 5 seam: 60" Th.
Designer of Plant: Nelson Davis Co.
Prep. Equip.: 4 Heidee Heavy Media Washers; Oil Dust. Treat.; Crushers; Vib. & Shkr. Screns.; Pek Tbl.; Ldg. Bins.; Calcium Freeze Proof
Daily Cap. (Cleaned Coal)(1 shift) 7,000 T
Sizes Washed: 4" x 2"; 2" x 4"; 2" x 1¼"; 1¼" x ¾"; 1¼" x 5/16"; 1¼" x 28 M; ¾" x 28 M
Sizes Shipped: Lmp.; Pea; Nut; Slack; Egg
Mng. Equip.: 1 Strp. Shvl.; 1 Dragline; 2 Ldg. Shvls.; 2 Horiz. Drills; 1 Wheel Excavator
Haulage Equip.: 17 Tractor-Trailers; Units
Power Pur.: D.V. 4000 A.C.; 440 A.C.
Prop. Owned: Employees 200; 3 shifts; 7000 T. daily; Life Expec. 25 yrs.
1966 Tonnage. 2,033,621

Cuba Mine No. 9

P. O.....Cuba, Fulton Co., Ill.
Ship.....Lewiston, CB & Q RR.
Ship.....Cuba, TP & W RR.
Supt. .....R. E. McAdams
Elec.....W. L. Shoop
M. Mech.....R. Clayberg
Pit Foreman .....Howard Phillips
Plant Foreman.....J. L. Sosey
Strip: No. 5 seam: 58" Th.
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: McNally-Norton Washery; Heidee Heavy Media; Deister Tbls.; Crusher, Shkr. & Vib. Scrns.; Pek. Tbl.; Ldg. Bins.; Oil Dust. Treat.; Calcium Freeze Proof
Daily Cap. (Cleaned Coal)(1 shift). 4500 T
Sizes Washed: 8" x 4"; 4" x 2"; 2" x 1¼"; 1¼" x ¾"; 1¼" x 5/16"; 1¼" x 28 M; ¾" x 28 M
Sizes Dried: ⅛" x 0
Sizes Made: Lmp.; Nut; Pea; Slack; Egg
Mng. Equip.: 1 Strp. Shvl.; 1 Ovr.-bdn. Drill; 1 Ldg. Shvl.; 1 Wheel Excavator; 1 Dragline
Haulage Equip.: 14 Tractor-Trailer Units
Power Pur.: D.V., 4000 A.C., 440 A.C.
Prop. Owned: Employees 106; 3 shifts; 4500 T. daily; Life Expec. 10 yrs.
1966 Tonnage. 931,826

Fidelity Mine No. 11

P. O ... DuQuoin, Perry Co., Ill.
Ship....Pinckneyville, IC & MP RR.
Supt. .....Eric E. Laurell
Chf. Clerk .....James Morris
M. Mech .....Wiley Mobbs
Pit Foreman .....Jack Poehrer
Designer of Plant: Koppers Co.
Strip: No. 6 seam: 76" Th.
Prep. Equip.: Koppers-Rheolaveur & McNally-Norton Washery; Dust. Treat. Crusher; Vib. & Shkr. Scrns.; Pek. Tbl.; Ldg. Bins.; Calcium Freeze Proof; Oil Dust. Treat. McNally-Flow Dryer
Daily Cap. (Cleaned Coal) (1 shift). 7,000 T
Sizes Washed: 7" Lmp.; 7" x 4"; 4" x 2"; 2" x 1¼"; 1¼" x ¾"; 1¼" x ⅝"; ⅝" x ⅜"; ⅜" x 10 M; 1¼" x 28 M; ¾" x 28 M; 5/16" Carb.
Scs. Dried: 1⅛" x 0
Sizes Made: Lmp.; Pea; Nut; Egg; Slack; Stkr.
Mng. Equip.: 2 Strp. Shvls.; 2 Ldg. Shvls.; 2 Ovrbdn. Drills
Haulage Equip.: 18 Tractor-Trailer Units
Power Pur.: 6000 KVA.; D.V. 4000 A.C.; 440 A.C.
Prop. Owned: Employees 175; 3 shifts; 7000 T. daily; Life Expec. 25 yrs.
1966 Tonnage. 2,080,351

Banner Mine

Loc. Glasford, Rte. #2, Peoria Co., Ill.
Supt.....R. F. Donaldson
M. Mech.....F. R. Clarke
Pit Fore.....A. H. Seeling
Elect.....O. W. Ernst
Plant Fore.....C. E. Rock
Strip: No. 2 seam
Mng. Equip.: 45 yd. Strip Shvl.; 1 Wheel Excavator; 1 Dragline
Prep. Equip.: H.M. Wash.; R&S Super Air Flow; Filter; Dust. Treat.
Haulage Equip.: 6 Trks.
Daily Cap. 3500 T.; Employees 65
1966 Tonnage. 800,340
For additional data, see page 417

Deep Mined Coals from No. 6 Seam in Southern and Central Illinois

distinguished for their basic character and excellent preparation for electric utility, industrial, metallurgical and heating uses

CROWN COAL / ORIENT COAL

ORIENT NO. 3 JEFFERSON COUNTY, SOUTHERN ILLINOIS

Shipping point Orient Mine No. 3, Illinois. Daily capacity 14,000 tons. One of the largest mines in the country. Famed for quality and excellence of preparation. The lowest ash low sulphur coal in Illinois for metallurgical, electric utility, industrial and heating applications. Extensive reserves.

ORIENT NO. 4 WILLIAMSON COUNTY, SOUTHERN ILLINOIS

Shipping point Orient Mine No. 4, Illinois. Daily capacity 7,000 tons. A special feature of this mine is its attractive glossy-black, firm structure coal, unusually low in moisture and high in Btu content. A popular dealer coal as well as a long-time favorite with utilities and industries.

ORIENT NO. 5 FRANKLIN COUNTY, SOUTHERN ILLINOIS

Shipping point West Frankfort, Illinois. Daily capacity 7,000 tons. Freeman's newest mine, highly automated for unusually precise control of both quality and sizing. Orient No. 5 coal is a low moisture, high Btu product, highly desirable for utility, industrial and heating uses.

CROWN MINE MONTGOMERY COUNTY, CENTRAL ILLINOIS

Shipping point Crown, Illinois. Daily capacity 10,000 tons. The largest air-cleaning plant in the country plus unusually versatile preparation facilities capable of meeting varied market requirements. Crown coal is widely used by utilities and industries, and also has a large and loyal dealer following.

Distributors of Choice High and Low Volatile Coals from Eastern Kentucky and West Virginia

FREEMAN COAL MINING CORPORATION

A DIVISION OF GENERAL DYNAMICS CORPORATION / 307 N. Michigan Ave. • Chicago, Ill. 60601 • ANdover 3-3800

GOVERNMENT EXHIBIT 232

THE ENERGY OUTLOOK

Although U.S. energy consumption patterns have remained virtually unchanged since World War II, two factors—increased competition among conventional fuels and greater public concern over the environment—have created doubts about the indefinite continuation of established trends

Abraham Gerber, Bruce C. Netschert

National Economic Research Associates, Inc.

In addition to reporting on prevailing trends in U.S. energy production and consumption, this article makes a number of statements concerning the outlook for the future. For example, the growth of underground distribution and control over the sulfur content of fuels and stack emissions may possibly halt or reverse the long-term downtrend in the cost of electricity. Although nuclear power is beginning to emerge as a competitor of fossil fuels, it is still too early to predict its eventual impact on the overall picture.

Developments in energy consumption in the United States during the 1960s have continued the trends established in the period since World War II. At the same time, however, new uncertainties have arisen that shed doubt on the further continuation of established trends for many of the individual energy commodities. The first of these uncertainties is the intensified competition among the conventional fuels and between the fuels and electricity, arising from a growing intersubstitutability among all forms of energy. The long-distance pipeline, which in previous years primarily affected competition in space heating and industrial use by making natural gas available throughout the U.S., is now bringing gas into direct competition with electricity through on-site generation of power from gas and the use of the waste heat for all heating-

I. U.S. energy consumption by consuming sector, 1961-1966, 10^{12} kilogram calories

Year	Household and Commercial	Industrial	Transportation	Electricity Generation	Miscellaneous and Unaccounted For	Total Gross Economy Input
1961	2625	3753	2769	2138	199	11,484
1962	2771	3890	2877	2282	180	12,000
1963	2787	4089	3015	2435	186	12,512
1964	2810	4281	3089	2610	192	12,982
1965	2972	4414	3206	2800	164	13,555
1966	3154	4515	3326	3040	134	14,168
Average annual rate of increase:	3.7%	3.8%	3.7%	7.3%	—	4.3%

Source: U.S. Department of the Interior, Bureau of Mines, *Minerals Yearbook.*

cooling needs. Simultaneously, the continuation of long-established trends of declining electricity costs and rising incomes has stimulated the invasion of electricity into a spaceheating market. Moreover, the long-heralded threat of nuclear power to the position of the conventional fuels, especially coal, has finally become a reality in the power fuel market.

The second uncertainty arose through the recent rapid development of public concern over environmental degradation, especially air pollution. This concern has taken the form of restrictions on the sulfur content of fuels and stack gases, and of governmental interest in the possibility of the electric automobile as a substitute for the conventional gasoline-powered vehicle. Although the effect of this development has thus far weighed most heavily on coal and oil, it is still too early to foresee the ultimate course of events.

II. U.S. consumption of crude petroleum, natural gas, and electric energy, 1961-1966

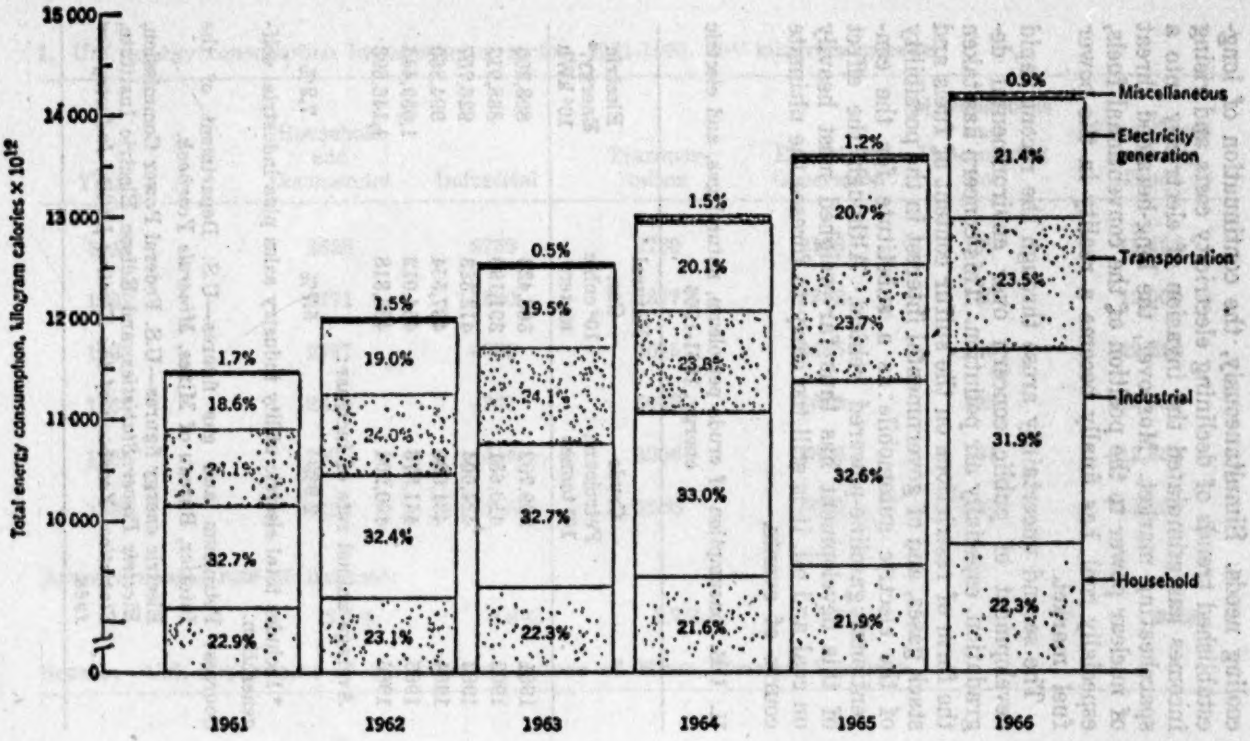
	Crude Petroleum, 10^3 tonnes	Natural Gas, 10^6 cubic meters	Electric Energy,* 10^6 kWh
1961	399,792	368,423	808,200
1962	410,651	391,190	868,917
1963	424,004	412,323	926,757
1964	431,086	437,554	994,360
1965	441,376	454,012	1,059,444
1966	460,904	486,818	1,146,693
Average annual rate of increase:	2.9%	5.7%	7.2%

* Includes total electric utility industry sales plus industrial self-generation.

Sources: Petroleum and gas figures—U.S. Department of the Interior, Bureau of Mines, *Minerals Yearbook.*

Electric energy figures—U.S. Federal Power Commission, *Electric Power Statistics,* and Edison Electric Institute, *Statistical Yearbook of the Electric Utility Industry for 1966.*

FIGURE 1. Energy consumption in the United States by consuming sector.



147

Another important area of interest has to do with the thermal pollution effects of cooling-water discharge from large power plants, especially nuclear plants, in local bodies of water. Growing concern over the thermal effects on stream ecology is beginning to play an increasingly important part in the location, design, and cost of power plant construction.

Another environmental factor that is also affecting electric power is the growing public opposition to the construction of overhead distribution and transmission lines on the grounds that they mar the esthetic beauty of the landscape. This has caused costly delays and re-routing of transmission lines. In distribution, where the technology is presently available, lines are increasingly being located underground, usually at a somewhat higher cost.

Recent and future growth rates

Total energy consumption in the United States grew at an average rate of 4.3 percent per year in the period 1961-1966 (see Table I and Fig. 1). Energy consumption for uses other than electricity generation grew at a rate of 3.6 percent. The rate of growth in the consumption of fuels for electricity generation was 7.3 percent, which was equivalent to the growth in electricity consumption itself (see Table II). Thus the use of fuels in power generation lifted the growth rate for total fuel use above that of direct fuel use alone. The growth in fuel consumption for electricity generation was little affected by the moderate improvement in average thermal efficiency at central stations from 31.7 to 32.6 percent, or an average increase of 0.19 percentage point over the period 1960-1965. (The 1966 figure was not available at the time of writing.)

In the latest five-year period the improvement in the average heat rate has slowed down considerably as compared with the overall trend since the end of World War II (an average increase of approximately 0.55 of a percentage point per year). There has been very little improvement in the best units during this period, and thermal efficiency in conventional fossil-fueled plants there-

fore appears to be nearing a plateau in the neighborhood of 40 percent. This slowing down in the rate of improvement in average thermal efficiency is likely to continue over the next ten years or so.

In the absence of the successful development of a new technology, such as magnetohydrodynamics, or the development of new materials that would make possible still further increases in temperatures and pressures employed, additional improvements in thermal efficiency are likely to be relatively minor in nature. The average, therefore, can be expected to decline only slowly as new fossil-fueled generating plants at today's highest thermal efficiencies are added to the existing plant population. Consequently, the growth in fuel requirements for electricity generation purposes will tend to grow in direct proportion to the growth in conventional fossil-fuel power generation. (Of course, it is anticipated that nuclear power plants will continue to operate at much lower thermal efficiencies than will the conventional power plants.)

The growth rates in energy consumption and electricity consumption shown in Tables I and II compare with an average growth of 5.6 percent per year in Gross National Product (measured in constant dollars) over the same period. Since total energy use grew at a slower rate than GNP and electricity use grew at a faster rate, the trends in energy-GNP relationships established in the years since World War II have continued: The total energy consumption per dollar of GNP continues to decline, whereas the consumption of electricity per dollar of GNP continues to increase.

These trends are the result of two fundamental economic features of long duration in the United States economy. One feature is the continuing shift in the structure of the economy, in which the governmental and service industry sectors are becoming ever-larger portions of total GNP. In 1966 these two sectors, which are not energy-intensive, accounted for almost one half the total. As a result, energy consumption per dollar of GNP has continued to decline. The other feature is the high income elasticity of the economy in relation to consump-

III. U.S. energy consumption by energy source, 1961-1966

Year	Anthracite	Bituminous Coal and Lignite	Natural Gas, Dry	Petroleum and Natural Gas Liquids	Electricity		Total
					Hydro-power	Nuclear Power	
1961	0.9%	21.5%	29.0%	44.9%	3.6%	0.1%	100.0%
1962	0.8	21.3	29.4	44.7	3.7	0.1	100.0
1963	0.7	21.6	29.9	44.2	3.5	0.1	100.0
1964	0.7	21.9	30.2	43.5	3.6	0.1	100.0
1965	0.6	22.4	30.0	43.1	3.8	0.1	100.0
1966	0.5	22.5	30.0	43.3	3.6	0.1	100.0

Source: U.S. Department of the Interior, Bureau of Mines, *Minerals Yearbook*.

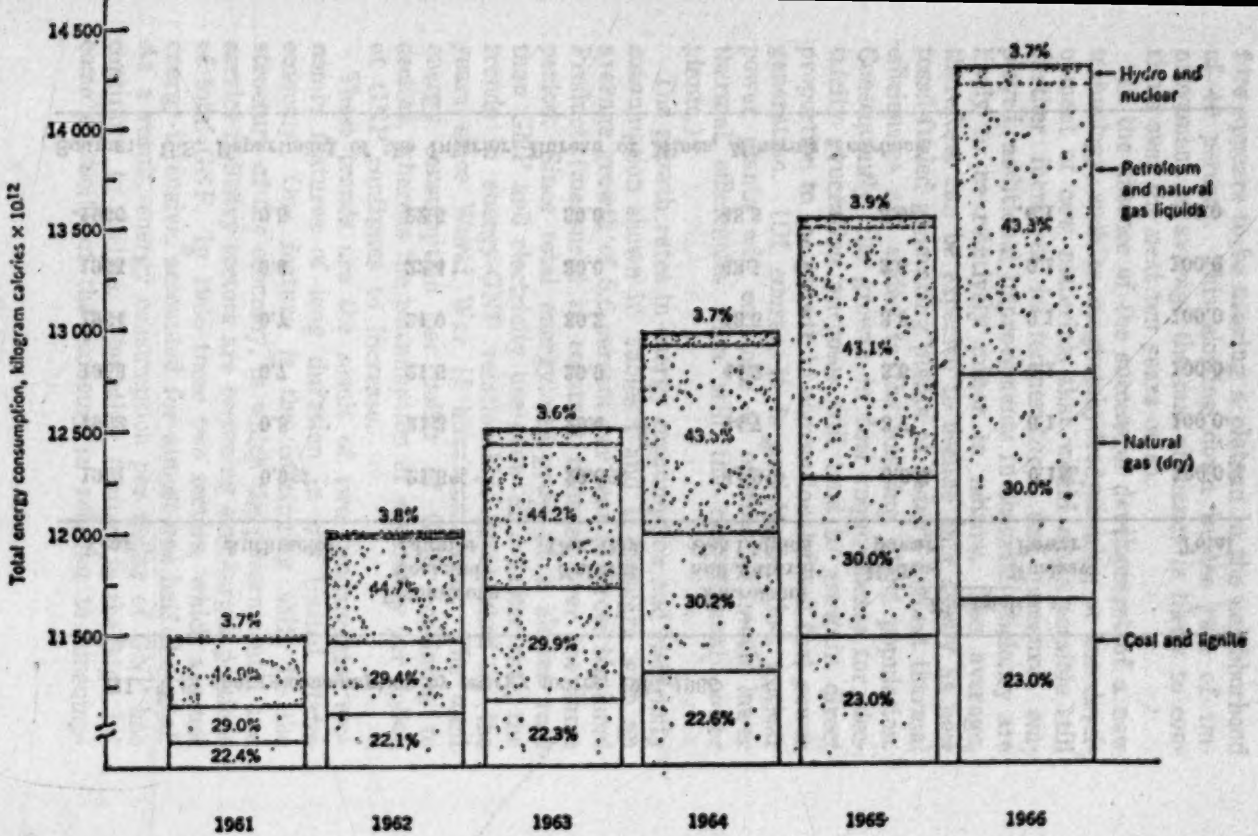


FIGURE 2. Energy consumption in the United States by energy source.

tion of energy in secondary and tertiary forms. As incomes rise there is a tendency to consume energy in a more processed or refined form of higher value. Therefore, as the United States energy economy has become less energy-intensive it has at the same time become more electricity-intensive.

There is nothing on the horizon at the present time to indicate any change in these general relationships. In its latest energy forecast, the U.S. Bureau of Mines expects the annual growth rate in the consumption of each of the fossil fuels to average 3.1 percent through 1980. Overall energy consumption is forecast to grow at a 3.3 percent rate and electricity consumption (excluding self-generated industrial electricity) at 6.5 percent. Thus growth in electricity is projected to be at roughly double the rate of growth in the fuels. GNP growth is assumed to be 3.9 percent.[1] All of these rates are lower than the experience of the 1960-1965 period; however, their relative positions remain essentially unchanged.

As shown in Table III and Fig. 2, the composition of the energy input pattern has changed very slightly in the past five years. It is significant, however, that coal shows a small but definite uptrend, and petroleum, conversely, a downtrend as a proportion of the total. Given the continuing more rapid growth in electricity production than in total energy consumption, these trends should continue. It is evident that the growth of coal would be greater were it not for the development of nuclear power.

Whether or not the competition of nuclear fuel with coal will be sufficient to hold the growth rate in coal at the same level as that of the other fossil fuels, as the Bureau of Mines projects, is a question that must remain unanswered at present, since the answer depends on the experience with the new generation of nuclear plants now being constructed.

Although nuclear plants in the past two years have constituted roughly half of the capacity ordered by the U.S. power industry, there has been almost no operating experience with the large-size units that have been or-

dered. To date, experience has been confined to 200-MW units at Yankee Atomic and Dresden I and the 400-MW San Onofre unit, which began operation in the summer of 1967. The operating performance of the 600-,800-, and 1100-MW units now under construction, which represent major extrapolations of the size of presently operating units, remains to be determined. In any event, the large nuclear share of capacity on order may be a misleading indicator of the inroads of nuclear power and may not accurately reflect its present competitive position.

Inasmuch as the acceleration of nuclear orders has exerted severe pressures on the limited manufacturing capacity, the construction lead times have stretched out considerably. Nuclear orders on the books now include some capacity for installation with an eight-year lead time. In contrast, units for fossil-fueled capacity continue to be ordered some three to four years prior to the expected operating date. If the nuclear portion of capacity were to be measured on the basis of capacity to be installed as of a given date rather than on the basis of capacity on order, it would be lower. For example, since manufacturing capacity for 1973 deliveries is already fully booked, all additional orders for thermal generating capacity to be installed by 1973 will have to be for fossil-fueled units.

Moreover, the size extrapolations could result in technical difficulties, with consequent delays in bringing these plants into operation. This raises the possibility of "brownouts" or even "blackouts" in the early 1970s. Already the record of delays in nuclear plant construction to date has caused some concern in the industry and may lead to the ordering of additional fossil-fueled capacity for installation at that time in order to protect against the possibility of such delays in bringing the nuclear plants on line. Thus, although the long-term outlook—say, two decades and beyond—may favor nuclear development, for the shorter term the fossil fuels (especially coal) remain very much in competition, with the share to be won by each still to be determined by its competitive vigor.

Coal remains the most important fossil fuel for electricity generation in the United States. In 1966 it still fueled 65 percent of the thermal generation and 54 percent of total generation. Although total coal reserves of all types are estimated by the U.S. Bureau of Mines to be about 1.5 X 10^{12} tonnes, the availability of reserves suitably located in sufficient quantity may prove to be a problem in maintaining coal's relative position in electric generation. The size of electric generating units and plants is increasing and the size of units capable of competing economically with nuclear power is likely to be in the 800-MW range and larger, with plant sizes of 2500 to 3000 MW visualized. (Along with the move to these larger sizes there appears to be developing the first glimmerings of a trend of great potential significance—the procurement of generating equipment from foreign manufacturers by the investor-owned utilities in the United States. During 1967 several large utilities announced such purchases, which previously had been made almost entirely by publicly owned systems.) A 2500- to 3000-MW plant would require 5.9 to 6.3 X 10^{6} tonnes of coal per year, or a total of about 180 X 10^{6} tonnes for each plant during its lifetime. If coal is to be supplied to these plants economically through the exploitation of the economies of scale in mining and transportation, it will have to come from no more than two or three large blocks of reserves, strategically located with respect to the generating plants.

In the absence of such economies of scale an annual requirement of such large tonnages would be difficult to provide at price levels competitive with nuclear power. Thus, with few exceptions, supply of small tonnages from a large number of mines is economically impracticable; nor can long transportation distances and high costs be tolerated. Some 71 percent of the coal reserves of the United States lie west of the Mississippi River, yet because of the transportation costs, these reserves cannot be considered for use in the area east of the Mississippi River, where the largest markets for power plant consumption are located. It will be difficult, therefore, to put together the large blocks of reserves needed for a

large-scale mining operation capable of providing economically the 6 to 6.5 X 10^9 tonnes a year that would be required for a 3000-MW power plant. If this is not possible, coal will face the erosion of its markets by nuclear power.

The outlook for oil raises different problems. A report issued by the United States Department of the Interior in 1965 [2] estimated that total consumption of liquid hydrocarbons (crude oil, lease condensate, and natural gas liquids) in the United States in 1980 would be at a level 26.7 percent greater than the consumption subsequently recorded in 1966. Since the petroleum industry, unlike the coal industry, must discover new reserves if such an increase is to be attained (or, indeed, even if present levels are merely to be sustained), the question naturally arises as to whether the requisite discoveries are likely to be made.

There is at present considerable controversy over this question. Although it is generally agreed that the required petroleum resources exist,* the industry contends that exploration for new reserves will be inadequate unless the price of crude oil rises. The situation is complicated by the already high cost of U.S. crude oil relative to oil produced elsewhere in the world. Under the Mandatory Oil Import Control Program instituted in 1959, imports of oil and oil products into the United States are subject to quota limitations and it is the stated policy of the U.S. Government that any significant increase in the price of domestic crude oil would occasion a review of the program.

(The quantity of oil and products imported in 1967 equaled approximately 21 percent of total domestic consumption. Under the quota system, imports other than residual oil are limited, on the East Coast, to 12.2 percent of consumption. In an attempt to stimulate the use of low-sulfur residual oil, the restrictions on its importation were greatly relaxed during 1967. Imports of

---

* The U.S. Geological Survey has estimated that approximately 200 X 10^9 tonnes of liquid hydrocarbons exist in nature within the borders of the United States and on the adjacent continental shelf. Of this amount, 133 X 10^9 tonnes remain to be discovered.[3]

crude oil and petroleum products excluding residual oil averaged 18.6 percent in the period from 1961 to 1966. Residual oil is excluded from this comparison since it is not produced in response to domestic demand; hence, imports of it do not affect the demand for crude oil.)

The industry also points to the sharp drop in the number of wells drilled that has already occurred in the past several years as evidence of the fact that a price rise for crude oil is not only needed for the future but is already overdue. It has not been demonstrated, however, that this lower drilling activity is related to the price of crude oil rather than to such other causes as the level of demand, more prolific exploratory targets elsewhere in the world, the development of reserves through improved recovery techniques (see below), or the decision of individual companies to divert some funds temporarily to other uses.

The outlook for natural gas and the opinions concerning it are in many ways similar. An industry-sponsored committee has estimated that U.S. requirements for natural gas through 1990 will be as follows[4]:

Year	Cubic Meters X 10^{12}
1975	0.722
1980	0.810
1985	0.906
1990	1.019

Another industry-sponsored committee[5] has estimated that the potential supply of natural gas as of the end of 1966 was 19.539 x 10^{12} cubic meters, excluding proved reserves.* This is approximately equal to the projected

* The definition and coverage[5] of the Potential Gas Committee's figure is wholly different from that of the U.S. Geological Survey's estimate of crude oil referred to previously. The Committee defines potential supply as "that prospective quantity of natural gas yet to be found and proved by test wells which can be expected to be drilled in the future under assumed conditions of adequate but reasonable prices and with normal improvements in technology . . . ." The Geological Survey figure, in contrast, refers to

cumulative requirements through 1990, but with the addition of present proved reserves the total supply becomes 27.72×10^{12} cubic meters. According to the estimates of the two committees, therefore, sufficient gas exists in nature to take care of U.S. consumption requirements through 1990, although serious supply deficiencies should begin to become apparent about that time. On the other hand, if the U.S. Geological Survey is correct, sufficient gas reserves exist to satisfy needs still further in the future, provided technology is equal to the task.

Nevertheless, as is true with respect to petroleum, there is controversy over whether sufficient discoveries will, in fact, be made, whatever the natural resource stock may be. Here, too, the industry argues—primarily in its presentation to the Federal Power Commission, which regulates natural gas † prices—that higher gas prices will be needed and, indeed, are already overdue. Again, well-drilling activity has declined in recent years. Although the Federal Power Commission has heard the industry arguments, it has not found them persuasive enough to take action.

Recovery efficiency and low-grade-resource use

The ability of the petroleum industry of the United States to maintain an increase in production in each of the past nine years (averaging 2.75 percent per year) has been increasingly the result of improvements in recovery efficiency. The most important contribution on this score has been secondary recovery, through the injection of water, natural gas, and other fluids and, to

---

the quantity existing in nature, with no qualifications as to economic or technologic feasibility. The Geological Survey estimate for natural gas on the same basis is approximately 104.6×10^{12} cubic meters remaining in nature, of which 95.6×10^{12} cubic meters remain to be discovered.

† The Commission has regulatory powers only over gas produced in one state and sold for consumption in another. Gas produced and sold for consumption within the same state is unregulated; in recent years such gas has amounted to 40-45 percent of the total gas consumed.

some extent, through "thermal recovery," involving the injection of steam or the burning of a small fraction of the oil in place.

Between 1959 and 1965 secondary oil production as a percentage of total oil production (including lease condensate) increased from 22.0 to 32.4 percent. The U.S. Bureau of Mines projects a continuation of this increase at an annual rate of 0.5 percentage point, so that in 1980 secondary production is expected to account for 41 percent of total production. The recovery efficiency, currently estimated to be a little over 30 percent, is expected to reach 40 percent by 1987.*

Recovery efficiency is also rising in coal mining. Although there are no direct data on the change, it can be inferred by changes in the proportion of coal produced by different methods. Surface mining, in which recovery may reach as high as 90 percent, continued its growth as a percentage of total coal mining in the period 1961-1966, rising from 30.3 to 33.7 percent. Auger mining, in which recovery is also greater, on the average, than in underground mining, rose from 2.0 to 2.9 percent in the same period. In addition, the progressive exhaustion of the coal seams, best-suited to the conventional room and pillar method of underground mining, has led to a small but growing application of longwall mining, with a consequent increase in recovery. In 1961 production by this method was only 24,000 tonnes. In 1966 it was over 2 million tonnes, 86 times greater.

There has also been improvement in the utilization of coal seams previously uneconomic to mine. The combination of surface and auger mining, for example, has had this effect, as has the increase in the depth to which surface mining methods can be extended. A new stripping machine, the largest yet built, can uncover economically coal seams 56.4 meters underground. Similar improvements have occurred in the ability to mine thinner seams: Continuous mining machines are now available for working seams only 6 meters thick.

The application of controlled nuclear explosions holds the promise of utilization of other hydrocarbon resources previously uneconomic to exploit. The first step in this

direction was the experimental detonation of a 26-kilotonne thermonuclear device at a depth of 1293 meters in the Pictured Cliffs formation in northwest New Mexico on December 10, 1967. The rock in which the explosion took place is known to contain natural gas, but its permeability is so low that production with conventional means is uneconomic. The purpose of the test was to see whether the results of the explosion will permit commercial recovery of the gas. It has been estimated that if the method of "nuclear fracturing" proves technically and economically feasible, its application throughout the western United States will create reserves of natural gas that are roughly double the present level.

Two other nuclear explosions in the planning stage involve the use of a 40-kilotonne and two 50-kilotonne devices in low-permeability gas formations in western Colorado. Still another project that will probably be carried through if the first test proves successful is a proposal to use underground nuclear explosions to recover oil from the oil shales of the Green River formation in Colorado, Wyoming, and Utah. Although shale oil recovery is already technically feasible through conventional methods of mining, crushing, and retorting the rock, continuing efforts over the past four or five decades have been unsuccessful in bringing down the cost of the product to a level competitive with crude oil. Success with nuclear explosions and drilling to produce the shale oil directly would make available a resource estimated to total several times the present world reserves of crude oil.

Uranium reserves in the U.S. at the present time are an uncertain quantity. The latest estimate of the U.S. Atomic Energy Commission is 181,000 tonnes of U_3O_8 in proved reserves available at a price of up to $22 per kilogram. This follows, however, a period of about a decade in which active exploration has been discouraged. The growth in nuclear orders in the past two years has stimulated an active exploration effort by the uranium mining industry, the results of which should become known over the next two to three years. It is reasonable to expect that the increased knowledge of uranium geol-

ogy gained in the past decade and the more systematic approach to uranium exploration compared with that carried out in the early 1950s will result in expanding known uranium reserves. In addition, improved recovery technology should make available reserves that at the present time are uneconomic.

Problems in the future production and utilization of energy

One of the outstanding phenomena in public attitudes and governmental policy in the United States during the past several years has been the rapid rise to prominence of concern with the environment. One of the most important subjects of this concern is air pollution, especially pollution by sulfur dioxide. Recent federal and local regulation and standards have imposed severe limitations in certain metropolitan areas on the allowable sulfur content of fuels under a series of progressive reductions applicable over the next few years. There is currently developing a trend toward the imposition of regulations prohibiting the use of fuel with more than 1 percent sulfur by weight in the metropolitan centers of the United States. At the same time, the technological justification of such a stringent standard is being increasingly questioned.

Although the new standards are being met in New York City, the first area for which they were adopted, it is as yet not at all clear how they can be met on a national scale. (Strictly speaking, Los Angeles was the first metropolitan area to set limitations on fuel use, but the emphasis was on the local smog problem rather than on sulfur dioxide as such.) The East Coast, which accounts for 66 percent of total national consumption of residual oil imports 84 percent of its needs. The Venezuelan product, which constitutes the bulk of the imports, is high in sulfur content. To date, the low-sulfur needs are being met by imports from other countries, but the supply of such oil, especially in the face of the growing concern over air pollution in other parts of the world, does not appear at this time to be adequate. One solu-

tion is to desulfurize high-sulfur oil, but there is a reluctance to commit the required large capital sums as long as it is not clear which of the many possible processes is the best. In any event, it is already evident that the use of low-sulfur oil will entail higher costs. For the initial conversion in the New York City area the increase is about one third.

There is also a problem with respect to coal. If coal used in power generation is limited to coal with 1 percent or less sulfur content, as seems likely, the usable U.S. coal reserves would be drastically reduced, since no economically satisfactory method for coal desulfurization as yet exists. Again, it is clear that the use of low-sulfur coal will entail higher costs regardless of the solution that is adopted.

One alternative that appears to provide at least an interim solution is the use of high stacks on power plants. The regulatory authorities in the United States are not yet convinced that high stacks capable of dissipating power-plant effluent into the atmosphere constitute a satisfactory solution. However, increasingly favorable experience with high stacks may improve their acceptability as a solution, at least temporarily.

An alternative that may solve the air-pollution problem for both coal and oil, at least for power stations, is the desulfurization of stack gases. But this, too, would certainly bring higher costs unless desulfurization technology were to permit the revenues from the recovered sulfur to exceed the cost of recovery. Further, it would require a change in the regulations pertaining to the sulfur content of fuels, for which the authorities have shown no enthusiasm to date; and there would remain the matter of high-sulfur fuel use by other consumers, for which stack gas desulfurization would not be applicable.

Another aspect of concern over the environment that has a bearing on the future production of coal is the tendency to impose more stringent regulation on strip mining, the most economic means for obtaining coal at the present time. The increasingly severe requirements for land restoration will tend to limit the extent to which

strip-mining technology can be exploited and, in any event, will tend to exert upward pressure on coal costs and prices.

Two other areas of concern with the environment are wholly power-industry problems. One is the matter of "thermal pollution." As station size passes the 1000-MW mark and as population growth and increasing urbanization make large station sites ever more difficult to find, the effect of such stations on the temperature of local bodies of water used for cooling purposes is becoming an important issue. It is no coincidence that cooling towers are beginning to appear in the United States, from which they have been absent heretofore. The first towers were built for plants located on small streams, but one is now under construction for a plant on the Ohio River, one of the largest streams in the country.

The problem of thermal pollution is especially severe for nuclear plants, which are, as yet, considerably less efficient than fossil-fueled plants. A nuclear plant converts about 25 percent less of the heat output into electric energy and, for an equal number of kilowatthours, discharges about 50 percent more heat into the cooling water than does a fossil-fueled plant. This has already created some difficulties in obtaining construction permits for nuclear plants, and in one instance has necessitated the use of cooling towers.

The second area is the effect of transmission and distribution lines on the appearance of the environment. Local authorities are putting increasing pressure on the power industry to install new distribution lines underground and in some instances to convert existing overhead lines to underground. There is pressure as well from both local and state authorities to put transmission lines underground and there is increasing difficulty in obtaining rights of way for the overhead lines.

The matter of underground distribution is not a severe technical problem for the power industry, but underground transmission is. Here public pressure is mounting, even though the technology does not yet exist. Nevertheless, under the circumstances, the necessary technology can be expected to develop, even though no one

can foresee its nature at this time. Meanwhile, the use of higher voltages (up to 765kV) is being adopted in order to provide a greater total capacity over a given right of way.

The significance of all these pressures on the power industry as a result of concern with the environment is that they threaten to halt or even reverse the previous continuous progress in reducing costs. Action to comply with each of the foregoing public desires will probably bring with it increased costs. Initially, as is true of low-sulfur fuel, the increase can be substantial. In the light of the present state of knowledge the installation of underground transmission will likely dwarf the other increases. It is probable that as technology catches up on each of these fronts the additional cost may be lessened, but there are no grounds, at least at present, for expecting or even hoping that the net result a decade or two from now will be lower delivered power costs than at present. For the power industry this prospect is especially ominous, as it comes at the very time when it faces greater competition from the fuels in a growing range of applications.

Although the total energy resources remain abundant, the energy markets in the United States are now subject to severe turbulence, as competition among all the energy sources to maintain or increase their market share continues to grow in intensity. The result, for the next decade at least, is likely to be continued availability of adequate total energy supply at close to present real cost.

Summary

Prevailing trends in energy consumption in the United States established in earlier years continued in the period from 1961 to 1966 and are likely to continue for the indefinite future. Developments during the period, however, suggest that trends in the level of consumption of the various individual sources and forms of energy are likely to change in the coming decade or two. Nuclear power began to emerge as a full-fledged competitor of the fossil fuels in power generation, but it is not yet pos-

sible to assess its likely impact on the consumption of fossil fuels in the next two decades. Similarly, the impact of measures to abate air pollution on energy consumption patterns in the near-term future cannot yet be foreseen. It is possible that control over the sulfur content of fuels and stack emissions, together with the movement to install power distribution facilities underground and limitations on the allowable thermal effect of central station condenser cooling on bodies of water, may halt or reverse the long-term downtrend in the cost of electricity.

Improvements continued in the efficiency of recovery of both petroleum and coal. The underground explosion of a nuclear bomb in 1967, conducted as an experiment to increase the recovery of natural gas in rock from which commercial production is now impossible, offered the promise of creating large additional natural-gas reserves in this manner and of making possible the commercial use of oil shale resources as well. Whether or not such efforts succeed, the outlook in the United States is for continued availability, for at least the next decade, of adequate supplies of energy in its various sources and forms without any appreciable increase in cost other than inflation.

This article is based on a paper presented at the 1968 World Power Conference held in Moscow, Aug. 20-24. The original paper will appear in the Proceedings of the conference, copyright Soviet National Committee.

REFERENCES

[1] *Minerals Yearbook*, vol. II, U.S. Bureau of Mines, Washington, D.C., 1965, p. 17.

[2] "An appraisal of the petroleum industry in the United States," U.S. Department of the Interior, Washington, D.C., 1965.

[3] Hendricks, T. A., "Resources of oil, gas and natural-gas liquids in the United States and the world," Geological Survey Circular 522, 1965.

[4] Future Requirements Committee, "Future natural gas requirements of the United States," vol. 2, Future Requirements Agency, Denver Research Institute, Denver, Colo., June 1967.

[8] Potential Gas Committee, "Potential supply of natural gas in the United States as of December 31, 1966, "Potential Gas Agency, Mineral Resources Institute, Golden, Colo., 1967.

[9] Scott, J., "What's ahead in oil recovery?" *Petrol. Engr.*, pp. 61-64, Nov. 1967.

Abraham Gerber received the B.A. degree from Columbia College in 1948 and the master's degree from Columbia University in 1950, after which he attended the New School for Social Research for a year on a graduate scholarship. In 1951 he joined the Department of Commerce's Office of Business Economics and shortly thereafter transferred to the Bureau of Mines, Department of the Interior. In 1953 he joined the American Electric Power Service Corporation, where he was later named administrative assistant to the president of the AEP Company. In 1961 he was appointed secretary of the System Development Committee, established for exploring new areas in the technical and economic development of the AEP system in all phases of its activities.

Mr. Gerber served as consultant to President Eisenhower's Cabinet Committee on Energy in 1953, as secretary of the Subcommittee on Energy and Raw Materials Resources of the EJC Engineering Research Committee in 1961-1962, as a member of the Technical Advisory Committee of the Office of Coal Research from 1961 to the present, as a member of the Fuels Special Technical Advisory Committee of the Federal Power Commission National Power Survey from 1962 to 1964. At present he is serving as senior consultant to National Economic Research Associates, Inc.

Bruce C. Netschert received the B.A. degree in geology in 1941 and the Ph.D. degree in economics in 1949, both from Cornell University. He joined the University of Minnesota, Duluth, as assistant professor in 1949, and in 1951 became a commodity-industry analyst for the U.S. Bureau of Mines. Later, as a staff member of the President's Materials Policy Commission, he prepared supply forecasts to 1975 for copper, lead, zinc, tin, and rubber. From 1953 to 1954 he was a consultant in the materials area for the National Security Resources Board and its

successor agency, the Office of Defense Mobilization. In 1954 he joined the Central Intelligence Agency, where he was branch chief responsible for nonferrous metals and nonmetallic minerals. As senior research associate for Resources for the Future, Inc., from 1955 to 1961 he conducted research on the future supply of fuels and energy sources, including nuclear and solar energy, and the future supply of the major metals. Since 1961 he has served as director of the Washington office of National Economic Research Associates, Inc., where he conducts and supervises research on a wide variety of subjects, with emphasis on fuels and energy resources. He is a member of Phi Beta Kappa, AIME and the American Economic Association and a fellow of the Geological Society of America.

GOVERNMENT EXHIBIT 233

AMERICAN POWER CONFERENCE LUNCHEON

Sponsored by

WESTERN SOCIETY OF ENGINEERS

and

AMERICAN NUCLEAR SOCIETY

THE FUTURE ROLE OF FOSSIL FUELS IN ELECTRIC POWER GENERATION

J. CORDELL MOORE
Assistant Secretary
United States Department of the Interior
Washington, D.C.

The tremendous growth in energy demand in the United States, to meet the requirements of an ever-expanding economy, is highlighted by a phenomenally increasing demand for electric power. While total energy increased by 58 percent between 1950 and 1965, consumption of energy resources for electric power generation increased by 131 percent.

Preponderantly, the root sources of energy to power the turbines of the electric utility industry have been the fossil fuels—coal, oil, and natural gas.

In 1966, nuclear energy provided less than 1 percent of the total power generated, and even the great hydropower resources of the nation provided only 17 percent of the kilowatthours generated. Thus, about 82 percent of the power was generated by fossil fuels, of which coal accounted for about twice as much as oil and natural gas.

But what of the future? If the past is any guide—and there is no reason to expect otherwise—we can expect that the demand for power in 1980 will exceed 3000 billion kilowatthours—nearly three times the demand in 1965.

Electric power will account for about 31 percent of total energy used in 1980, compared with 23 percent in 1965.

Within the past few years many things have happened which can, and will, change the energy mix used for power generation.

Developments of the next five years will have a significant impact on the extent to which the respective fossil fuels will share in the growing power market.

The two main factors are the growth of nuclear power generation and the severity, extent, and timing of air pollution regulations. There are other important factors, of course: the adequacy of the reserves of the different energy sources; the productive capacities of the industries to produce the fuels required; the costs and prices of the competing fuels; plant operating efficiencies; and the outcome of intensified research now under way, including the development of new methods for power generation.

All of these can be expected to affect in a multitude of ways the future role of the fossil fuels in power generation.

NUCLEAR POWER

Very significant strides have been made in the technology of nuclear generation of electricity, and new capacity announced during 1966 exceeded that announced for coal-fired plants.

This upswing has since declined.

The chronology of new nuclear plant capacity annouced or contracted since 1965 is as follows:

	MW
1st half, 1966	4,400
2nd half, 1966	9,600
1st half, 1967	21,000
2nd half, 1967	6,700

More importantly, during the past two years the costs of nuclear systems have increased as much as 40 percent in some cases, compared with significantly lesser increases for some coal-fired systems.

TVA, for instance, after ordering a nuclear plant in 1966 on the basis of competitive bidding, turned to a 1.3 billion kilowatt coal-fired unit for its next large plant, apparently because nuclear plant prices had risen so sharply.

Other factors affecting the rate of growth of nuclear power include the lengthy time lags in the delivery of new nuclear systems, the lack of experience in operating larger capacity plants, and reserves of uranium oxide.

As a result of these and other factors, it appears that many in the electric utility industry now are adopting a more cautious wait-and-see policy regarding nuclear.

Although air pollution is of little concern in nuclear generation, nuclear is not without its own environmental problems. Disposal of radioactive wastes is of vital importance, as is the prevention of thermal pollution of streams and coastal waters.

Measures to control these add to the ultimate costs of nuclear generation.

Difficulties are a common expectation of all new systems, but we cannot underestimate the value and importance of nuclear power generation.

On the contrary, the recent and continuing technological advancements in nuclear production of power have been most impressive.

They demand the respect and support of all who are interested in adequate supplies of energy for our future population and expanding economy.

AIR POLLUTION

Let us now turn to an even more pressing problem that will affect fossil fuel use in power generation and about which I will speak at length today—air pollution.

Most air pollution control ordinances, already enacted or under consideration in states, counties, and major metropolitan areas, include provisions restricting either the sulfur content of fuels or the sulfur oxide emissions to the atmosphere, or both.

Areas in which sulfur limitations have been imposed are widely distributed geographically.

Los Angeles County was the first, and since then sulfur limitations have been adopted for the Metropolitan New York area, Dade County (Florida), New Jersey, St. Louis, and in Montgomery and Prince Georges Counties (Maryland).

Other areas currently considering air pollution controls on sulfur and sulfur oxides are mainly in the eastern part of the United States, and we can be sure that similar restrictions will be established, in one form or another, by additional governmental jurisdictions.

Natural gas, because it is relatively free of sulfur compounds, is not affected, but users of coal and residual oil will have to find some means to meet these new regulations.

To meet new antipollution requirements for sulfur oxides the following three alternatives are being given major attention:

1. New sources of fuel supply.
2. Fuel desulfurization processes.
3. Sulfur oxide removal processes.

There are other alternatives, such as the use of tall stacks and the location of new plants in rural areas, both of which will reduce ground-level concentrations of sulfur oxides. At best, these are interim solutions since they do not contribute to the overall reduction of air pollutants.

Another alternative to which considerable research effort is being directed is the development of new methods of power generation, for example, magnetohydrodynamics (MHD), electrogasdynamics (EGD), the fuel cell, etc.

These methods would not only contribute greatly to cleaner air through the higher efficiency of power generation, but would reduce thermal pollution of streams while conserving fuels.

Unfortunately, they are not expected to be commercially available for ten years or so.

First, let us consider new sources of fuel supply as one way to meet the new requirements.

It has been estimated that 95 percent of the coal con-

sumed in the 20 cities with the worst sulfur-oxide problems could not meet a 1-percent maximum sulfur content limitation.

In fact, one analysis indicates that more than 99 percent of the coal used in power plants in major metropolitan areas had a sulfur content over 1 percent. Since more than 96 percent of the total electric utility coal is consumed in power plants east of the Mississippi River, the largest potential source of supply of low-sulfur coals for these plants is concentrated in a small area comprising a few states in the southern Appalachian area.

In 1967, of the 264 million tons of coal shipped to electric utilities east of the Mississippi River, coals from this southern Appalachian area accounted for only 63 million tons, or 24 percent.

The remaining low-sulfur coals from this area were shipped principally to coke ovens of the steel industry and to United States coal export markets.

Our coal exports, incidentally, provide close to one-half billion dollars annually in credits to our international balance of payments.

In other words, if the electric utilities in the east are to meet the more stringent requirements of air pollution regulations, the coal mines in this relatively concentrated area will be called upon to increase substantially their productive capacity.

In total, the reserves of low-sulfur coal in this southern Appalachian area are adequate, but a large portion of them are owned by, or large tonnages are committed to, the steel industry.

Furthermore, these deposits are relatively costly to mine, and their longer distance from utilities would make them more costly than the higher sulfur coals now consumed in these plants.

Depending on the plant location, cost increases of from 25 to 40 percent can be expected.

As in the case of coal, the future of power generation from residual fuel oil will be affected materially by air pollution controls.

About 90 percent of the residual fuel oil consumed on the eastern seaboard where the sulfur oxide problem is

developing is imported, principally from Venezuela and the Caribbean, and ranges in sulfur content from 2 to 3 percent.

The other 10 percent of the residual fuel oil consumed on the East Coast is produced in this area from domestic and imported crudes.

Domestic crudes, and thus, residual fuel oil produced from them, are relatively low in sulfur content, averaging about 1.6 percent, but they comprise a very small portion of the total consumed in this area.

Accordingly, the residual fuel oil consumed in power plants on the eastern seaboard in 1966 contained an average of about 2.5 percent sulfur.

Given adequate lead time, additional amounts of low-sulfur residual from low-sulfur crudes could be made available to East Coast plants.

Based on recent price differentials, this may cost 20 to 30 percent more than is now paid for high-sulfur residual fuel oil.

Natural gas is a significant factor in power generation, accounting for about 22 percent of energy used in power generation last year.

It should be noted, however, that nearly 85 percent of the natural gas was used for power generation in areas west of the Missippi River.

It is expected that most of the increase in natural gas used for power generation will develop in the west and will not offer a satisfactory answer to the sulfur dioxide problem in the east.

The immediate problems of using natural gas extensively as a substitute for coal and oil to meet air pollution regulations are inadequate pipeline capacity in relation to the quantities involved and the substantially higher cost of service on a firm basis over that on an interruptible schedule.

A second way to reduce sulfur oxides is by fuel desulfurization processes.

In the case of coal the degree of sulfur removal depends essentially on the amount of pyrites present and how they are dispersed in the coal.

The number of coals amenable to sulfur reduction are somewhat limited.

Furthermore, the use of conventional processes to effect substantial reductions in sulfur content are quite costly. For example, to reduce the sulfur in a Pittsburgh bed coal from 2.5 to only 1.5 percent would cost about $3.00 per ton.

Detailed information on the costs of desulfurizing residual oil is not available, but a recent study by the Bechtel Corporation estimated that the incremental cost of reducing the sulfur content of typical Venezuelan crudes from 2.6 percent to 1.0 percent would be 58 cents per barrel.

Since the density of the product is lower than of the high-sulfur feed to the process, the desulfurizing cost would be 72 cents on a per Btu-equivalent basis.

In this case, the East Coast delivered cost of residual desulfurized to 1 percent sulfur would increase by 30 to 40 percent.

Moreover, it will require adequate lead time to make available large amounts of low-sulfur residual fuel oil to the East Coast, and then only at a substantial increase in fuel costs.

The third method for sulfur oxide control is through stack removal processes.

During the past few years, research and development efforts have been expanded considerably on processes designed to remove sulfur oxides from the gases in the combustion chamber or in the stacks of plants burning high-sulfur coal or residual fuel oil.

More than twenty different organizations are engaged in this activity, and progress has been encouraging.

On the basis of tests to date, the cost of removing sulfur-oxides from stack gases will be substantially less for most large new plants—and I repeat, for most large new plants—than the cost of substituting fuels or of removing sulfur from fuels.

In each case the stack-removal process is cost-sensitive to certain factors, and the values have not yet been fully defined.

Against this background of nuclear energy develop-

ment and the impact of air pollution regulations, what will be the future role of fossil fuels in power generation?

About 3 years ago the best estimate for installed nuclear capacity was 70,000 megawatts by 1980.

On this basis, and with air pollution at that time being considered to have only a minor impact on fossil fuel use, we estimated that the utility industry would consume 554 million tons of coal, 137 million barrels of oil, and 2.87 trillion cubic feet of gas.

In nearly every year since 1964, the estimates of installed nuclear capacity have been increased, and the most recent estimate by AEC is now 150 to 170,000 megawatts by 1980

With the long delivery times for nuclear plants, the recent decline in nuclear plant orders, and the concern over uranium supplies, these recent estimates of installed nuclear capacity may not be revised upward sharply as they have in the past.

The impact on the energy-mix of the greatly increased emphasis on air pollution is much more difficult to evaluate.

Obviously, the demand for electricity which will exist in 1980 will have to be satisfied.

The supply of hydroelectric power is relatively inelastic, so that the balance of the kilowatts that will be needed will have to be supplied by fossil fuels, after allowing for the best estimates of those that will come from nuclear energy.

Under these circumstances, while there may be some shift between the competing fuels due to the impact of air pollution regulations, it is clear from our evaluation that no major shifts between the fuels can be expected by 1980.

There could, however, be very appreciable changes in the *sources* of supply of the individual fuels, at least until successful sulfur dioxide removal processes are developed.

Taking all the new developments into consideration and if the AEC estimates of 150,000 MW by 1980 prove correct, present projections for fossil fuel use by the utilities for 1980 would be reduced by the coal equivalent of about 200 million tons.

This is a decline of 30 percent from our Bureau of Mines 1965 estimates, but because of the growing demand for electricity it still represents an increase in fossil fuel use by the electric utilities of more than 150 percent over the present requirements.

The fossil fuels will have to continue to supply the largest share of energy for electric power generation for the next ten years.

In the longer term, however, their use could be curtailed unless increases in productivity, efficiency, and low-cost methods for controlling the detrimental effects on the environment—land, air and water—are found.

The prospects are good, however, that research can find the necessary methods to keep fossil fuels competitive in the electric utility market.

GOVERNMENT EXHIBIT 239

The COMMERCIAL *and* FINANCIAL

CHRONICLE

Serving the Financial and Business Community for One Hundred and Twenty-Eight Years

Copyright © 1968 by William B. Dana Company

Vol. 207 Number 6766 Price 75¢ a Copy

New York, N.Y. 10007, Thursday, March 7, 1968

NEW HORIZONS FOR COAL— THE COMEBACK INDUSTRY

By ROBERT E. LEE HALL *
Senior Vice President, National Coal Association, Washington, D. C.

For the benefit of skeptical financial analysts and investors, Mr. Hall describes coal industry's successful comeback and limitless horizons, due to technological breakthroughs, and growing signs of oil, gas and even atomic energy limitations. He explains why electrical utilities have become coal's biggest customer, quotes Atomic Energy Commission Chairman Seaborg's admission regarding the increasing use of coal for the production of electricity over the next several decades, and cites statements by the gas and oil trade association as to the limitations of the fuels they respectively represent. Note is taken of coal's increasing exports, and prospects of making high-octane gasoline and quality gas from coal.

The coal industry is on the rise. That statement alone should startle anyone who has not looked at the modern coal industry in recent years. If you dimsissed coal from your mind a few years ago—wrote it off back in the days

when some phrase-maker characterized it a "sick industry,"—I can only report that you wouldn't recognize the patient today.

Coal production in the United States hit 532 million tons in 1966, up 4 percent from the previous year—and in 1967 was up about 7 percent ahead of last.

You may think that with an expanding population and continuing prosperity, this is not a significant fact. The United States used more fuel of all kinds than ever before. But consider this: For the second consecutive year, coal increased its share of the total energy market in the United States.

Time was when coal supplied almost two-thirds of the energy consumed in the United States. Less than 20 years ago, it supplied half. Then it hit the skids, thanks in large part to the competition of other fuel supplying industries. Coal had abundant resources, more than those of oil and natural gas, but it neglected the other side of this partnership—it let its technology lag.

When the superior efficiency of the diesel locomotive sent the old steam engines to the scrap heap, and when the superior convenience of oil and natural gas captured most of the home-heating market, coal lost two of its biggest outlets. About the same time, wages of miners rose sharply, and it became impossible to mine coal the old-fashioned way and stay in competition for the markets that remained. It was about this time that the writers began calling coal a sick industry, and it seemed like a good diagnosis.

But the coal industry breeds some stubborn men, whether they are miners or Chairman of the Board. The industry called on technology. The first step was to modernize the mining process. This has been done by heavy investment in complex machinery—but done so successfully that coal has bucked the trend of inflation. The average f.o.b. mine price of coal was $4.99 per ton in 1948; last year it was $4.55. The average miner produced about six tons a day in 1948; today he produces about 18 tons.

The business gamble has paid off, and bituminous coal today is a competitive fuel to be reckoned with in Amer-

ica's industrial economy. We acknowledge with some sense of gratitude, a debt to the financial community for gambling with us—and, of course, of having the same commendable confidence, wisdom and foresight as the coal producers themselves!

Coal's Biggest Customer

With increased ability to get coal out of the ground quickly and economically, we still needed some place to sell it. That place was the electric utility industry, which has been doubling its capacity every ten years. Electric generating stations are now coal's biggest customers, taking more than half our output and using it to generate more than half of the electricity in the United States.

Between mine and market there was the problem of costly transportation. The railroads gave us a big part of the answer with unit trains—hauling 10,000-ton lots direct from a single mine to a single power plant at rates as much as 50 percent below the old single-car tariff. By drastically cutting lost time—or by utilizing rolling stock more efficiently—and by reducing the amount of paperwork involved in freighting coal to market, the coal-carrying railroads have been able to make substantial reductions in shipping rates, in some instances by as much as $1.50 per ton. These economies extend coal's ability to compete in domestic energy markets at a time when competition is keener than ever.

About one-third of our coal output comes from surface mines—the strip mines—where mechanical giants, looking for all the world like prehistoric monsters, remove the overburden from the coal seams and expose the coal for smaller shovels to scoop into huge trucks. This mechanical revolution in the coal mining industry is far from complete, according to all indications. Coal mining equipment manufacturers have on the production lines and their drawing boards, more efficient machinery to raise to even greater levels the amount of coal produced on a ton-per-man basis.

About 100 million tons of coal is moved annually along America's inland waterways, and bigger tows of coal-

carrying barges again are resulting in reductions in the cost of delivering coal to customers. New and more efficient loading and unloading machinery at inland docks adds to the savings.

Meanwhile, the utilities have been busy with technology, too. In many places they are building mine-mouth power plants which consume up to two million tons of coal a year from mines right next door, and then ship their power over extra-high-voltage transmission lines to load centers 300 miles or more away.

One other mode of transportation, developed by the coal industry itself, is the coal pipeline. This is a perfectly feasible system—it has helped convince the railroads to try unit trains. The unit train rates closed down a 108-mile pipeline that operated for five years in Ohio—but where no rail service is available, it's still a good way to move coal. In fact, the Southern Pacific Railroad is getting into the coal pipeline business; with the Southern California Edison Company it is building a 275-mile line from a new Peabody Coal Company mine in northeastern Arizona to a power plant in Nevada. The plant will supply electricity to California—and that's one new horizon for coal. This is coal's first large-scale invasion of the huge West Coast energy market.

It won't be the last. There are tremendous coal reserves in the Rocky Mountain area. Between them and the huge energy demand in California lies nothing but a few hundred miles of difficult geography. Technology is already bridging that gap.

Well, what about the horizon for coal? What lies ahead?

First, what about our biggest market, the electric utilities? Will we hold on to it?

That's a good question, and I'm glad I asked it. There are half a dozen answers, and all of them are "Yes"—coupled with different reasons.

Utilities Market

Utility decisions to burn coal in new generating plants are being made on the basis of sound economic facts of life. Electric power industry executives know, for ex-

ample, that bituminous coal is the most economical fuel available for generating station use in the United States.

In 1965, the most recent year for which we have complete data, the national average cost of coal burned in steam-electric power generation was 24.4 cents per million Btu. Natural gas ranked second at 25.0 cents, and oil was a rather distant third at 33.1 cents per million Btu.

I was too modest when I said coal generates half the electric power in the United States. When we take the 80 percent of the power produced by steam-driven generating plants, using some sort of fuel, coal's share of the market goes up to 65 percent. And it's a growing market —it took 265 million tons of coal last year, up 9.2 percent from 1965. This year, we expect the utilities will burn about 281 million tons.

Export Market

A significant element of strength in coal's future lies in the export market, where American coal is becoming more competitive (and necessary) than ever. Thirty percent of the coal we now export comes here to Canada to be used for metallurgical purposes, for electric power generation, and for general industry markets. The European Common Market countries take another 40 percent of the U.S. coal exports, primarily for metallurgical use, although almost all of our exports to West Germany go for other uses. Exports to Japan, accounting now for about 15 percent of total foreign shipments, are entirely metallurgical.

Colliers capable of carrying 80,000 tons or more are now in use, and more are under construction. At our East Coast ports, such as Hampton Roads, modern equipment permits loading of these huge colliers in a matter of hours, reducing turn-around time to a minimum.

Obviously, with that share of the market and that sort of price structure—not to mention comparative reserves—coal is going to be around a long time in the existing plants of the electric utility industry.

Unquestioned Reserves

On second thought, I will "mention" comparative reserves. Both in our own country, and elsewhere throughout the world, questions are being raised about the adequacy of reserves of oil, natural gas and uranium—the necessary ingredient for atomic power. U.S. coal is not subject to such question. Measuring current recoverable reserves of coal in the United States against present and projected demands reveals some 830 billions of tons of recoverable coal yet to be mined in the United States, reserves sufficient for the next 1,000 years.

Up to this point, I haven't said a word about competition, present and anticipated, from atomic energy. I will now say several.

Let's examine these partners for progress: resources and technology. Housebreaking the atomic bomb, harnessing nuclear energy to produce electric power, is surely the greatest technological triumph of the first two-thirds of this century. In many countries, and particularly in my own, great amounts of scientific manpower, and great gobs of the taxpayers' money have been spent on it.

And, to a degree, this massive effort has succeeded. The technology of atomic energy has been developed until it is, in many areas of the United States, competitive with power generated from coal—or oil, or natural gas.

Atomic Costs Are No Longer Cheaper

I might add here that this competitive status, proclaimed in public statements and image-building advertising by the makers of atomic reactors, has apparently been attained at the expense, at least in part, of their stockholders. For example, General Electric landed a contract for two large atomic power units for the Tennessee Valley Authority, and made much of the fact that they were supposed to produce power more cheaply than coal.

But then GE announced a price increase, and admitted in its annual report that its reactor division had operated for years at a loss; with the price increase, GE said, it hoped to make a profit on the division for the first time. In other words, all the reactors it had sold

previously, including the two to TVA, were subsidized by GE shareholders.

Two or three months ago, TVA again ordered new generating equipment—but this time it said that because of increases in the price of reactors, coal and atomic power were again running neck-and-neck. It ordered a third reactor to go with the two previously bought—but it also ordered a new generating unit, which will be the largest ever built, and it will be powered with coal.

So as to technology, let's say for the moment that coal and atomic power are about even in the electric utility market. But how about the other partner, resources?

As I mentioned before, and repeat for emphasis again, in the United States, the very conservative U.S. Geological Survey says we have 1.6 trillion tons of coal. Using the rule of thumb that half the coal in the ground is recoverable, that is a resource of 830 billion tons of coal. In fact, coal constitutes 68 percent of all U.S. mineral fuel resources, including oil, gas and such undeveloped resources as oil shale.

Low Uranium Supply

On the other hand, low-cost U.S. uranium resources, although among the largest in the world, are only a fraction as great in terms of energy content. In fact, fraction is too impressive a word—would you believe a quarter of one percent? Known reserves of uranium oxide, or yellowcake, in the United States are 140,000 tons. This is energy equivalent to two billion tons of coal—or about as much coal as U.S. utilities will burn in the next eight years.

In fact, the United States does not have enough low-cost uranium—and by low-cost I mean around $8 per pound of yellowcake, or about the cost of the fuel for the reactors which are now competing with coal—to assure a fuel supply for the expected life of the reactors now operating, under construction or announced.

I did not invent these figures. They are based on public statements of officials of the U.S. Atomic Energy Commission, and the Chairman of the Commission, Dr.

Glenn T. Seaborg, has conceded the correctness of our calculations. In fact, we differ with the AEC on this question in only one major respect—AEC says an intensive search for more uranium is under way, and it expects to find more. We say more uranium will undoubtedly be found—but we are skeptical that anyone will find the fantastic amounts that will be required to meet the grandoise plans of some atomic energy promoters.

Squandering Our Reserves

For the type of reactors being built now are highly inefficient consumers of uranium. AEC is trying to develop more efficient ones, including the so-called fast breeder reactor which would convert atomic fuel into fissionable form at a greater rate than it consumes it, so that after 12 to 15 years, such a plant would be able to refuel itself and another of the same size. (You can see that even the fast breeder willl not entirely meet the needs of the utility industry evem if it keeps doubling very ten years.)

Though our supplies of coal are vast, they are finite. Some day we will need our low-cost uranium much more than we do now—need it to fuel the first fast breeders. But AEC is squandering it now in slow, inefficient, unneeded reactors—feeding the seed corn to the hogs. It is putting its trust on a long-shot hope that somewhere, somehow, it will find more uranium—enough more, and cheap enough, to replace that being squandered today. Like Mr. Micawber, it lives in the confident expectation that something will turn up.

Charles Dickens would be thunderstruck. He conceived Mr. Micawber as a shabby-genteel failure, not a policy guide for a well-tailored multi-million dollar industry and a great shiny government agency.

Advises Canada Not to Sell

Now I am quite aware that Canada has a lot of uranium—perhaps more than the United States, and certainly more than Canada now needs. If the United

States is short of uranium, it represents a market for the Canadian product—but I suggest that Canada ought not to sell.

Only three countries of the free world have substantial uranium deposits. One is the United States, which as we have seen will need to keep all its uranium for its own use. Another is South Africa, which produces a limited amount of uranium as a by-product of its extremely deep and difficult gold mining, but cannot increase this output greatly except at skyrocketing cost. That leaves Canada with the main supply of uranium available to the rest of the free world.

Many energy-poor nations are turning—or want to turn—to atomic power for their industrial development. Because they must import conventional fuels, or the cost of producing their own fuels is high, they can afford to pay more for atomic fuel than can the United States. It is in these countries that Canada should sell its uranium. There it will do more good—and there, frankly, Canadians will make more money. If some of these countries are not yet ready to buy Canadian uranium, just wait. They will be.

Well, I have given you a long answer to a short question, what about atomic power? Dr. Seaborg answered it more directly and with more authority recently when, as Chairman of the Atomic Energy Commission, he declared:

> "Atomic energy will play an increasing role in the production of electricity, but I do not believe it will eliminate the use of coal and oil for this purpose for many, many years to come. Present projections show an increase in the use of coal for the production of electricity for the next several decades, because power needs will grow so fast that all our energy resources must be employed. It is clear that coal will play an important role in our future energy supply picture."

Sulfur Pollution

Without conscious attempt to pun, one "cloud" on coal's horizon is the over-response of local air pollution authorities to the enormous effort of the U.S. Public Health Service to point an accusing finger at sulfur dioxide from coal burning as a public offender. We feel confident, however, that the rule of reason will eventually prevail since recent Congressional hearings have proven that HEW has been moving too fast in the field of accusation without sufficient proof. Tall stacks offer the only existing feasible technology to minimize sulfur dioxide in any significant amount at ambient levels. The "state of the art" has not yet developed other feasible control methods. However, research by industry and government is at the "breakthrough" stage and we believe solutions are at hand.

Similar research efforts in the past have been successful in developing a technology which makes it possible to control more than 99 percent of the soot, dust, and ash from coal burning, thus removing one of the former problems encountered in coal burning. The coal and utility industries are now spending millions of dollars on research to control sulfur oxides. Congress in the new clean-air bill is considering authorizing accelerated Federal research on the subject. We are confident, therefore, that these problems will be met before serious damage is done to the coal complex.

A few other factors of coal's future with electric utilities: Nearly all major utilities are buying coal now on long term contracts—some as long as 30 years. This is a big new stabilizing factor in the coal business, where once the practice was to get a mine ready and then operate it when, as, and if your salesmen could dispose of the coal on spot contracts. Now a company, assured that money will be coming in on a contract for 30 years, can dedicate a whole new mine to that customer. You may be hearing more about this, for the company may be coming to the financial community for capital to install the mine.

I'm afraid I've given the impression that the coal industry is placing all its bets on the electric utilities. It

isn't. Most other present markets will increase, though not at such a pace.

Coal By-Products

But there are bright horizons in new directions for coal. At the risk of making analysts unhappy, I can report good prospects for high octane gasoline and pipeline-quality gas from coal.

There is now in operation at Cresap, West Virginia, a pilot plant for producing gasoline from coal. The process was developed through research by Consolidation Coal Company. The plant was built under a contract between the coal company and the U.S. Office of Coal Research of the Department of the Interior. There is every reason to expect that the gasoline produced at this plant will be reasonably competitive with gasoline produced from crude oil. Another process, the H-coal process under development by Hydrocarbon Research, Inc., of Trenton, New Jersey, under another OCR contract, is also moving forward toward the pilot plant stage with equally good prospects for success.

While the competitive factor is an important aspect of gasoline made from coal, bear in mind that domestic reserves of crude oil in the United States are limited, while coal reserves are not, in terms of long-range demands. Proven U.S. petroleum reserves are reported now at approximately 31 billion barrels, which represents a reserve life index of only 10.98 years supply,[1] with total world reserves listed at 300 billion barrels. By contrast, it has been estimated that recoverable reserves of U.S. coal contain 2,300 billion potential barrels of oil—that's 2 trillion, 300 billion barrels! No wonder we feel there is a justifiable bull market on coal! And on coal STOCKS for that matter!

Under joint industry and government sponsorship, coal gasification research is forging ahead. The so-called carbon dioxide acceptor process and the hydrogasification process are at relatively advanced stages of development. It is now possible to project future pipeline quality gas production costs based on coal as the raw material—and the product appears to be competitive.

The need for gas from coal only incidentally results in the development of a new market for coal, since reserves of natural gas in the United States, like those of petroleum, are also limited. New gas discoveries are not sufficient to reverse the downward trend of the reserve life index of natural gas, now only at 16.54 years supply.[2] Supplemental supplies of synthetic gas will inevitably be needed later in this century, and the coal industry will be ready to supply it at competitive prices because of research being pursued.

This is what the modern American coal industry is all about, and what the future looks like to us who are in it. Nor is it just partisan optimism, for there is an abundance of factual evidence to justify the confidence in coal, despite the implications of the atom, environmental problems, or the rising cost of labor and materials. Utility systems are entering into long-term contracts with coal producers, who in turn are dedicating production from new mines to meet the lifetime needs of new generating plants. High-quality coking coal from U.S. mines also is being shipped to overseas destinations under long-term contracts.

All in all, the bituminous coal industry in the United States is a healthy segment of our economy. In looking ahead, we are not arbitrarily downgrading the importance of the environmental problems that must be solved if our projections are to be realized. The fact is that we have already discounted—in the investors' sense—any pervasive effect on future markets inherent in the public's proper cry for cleaner air, beautification of the land and purification of our water. These problems must and will be met in a partnership between industry and government.

One hundred years from now we may not recognize our cities as you see them today. There undoubtedly will be excursions run to the moon and, perhaps more unbelievable, there may not even be a KENNEDY in public office—but as Churchill once said of England, there will always be a coal industry.

In 2067 we will have only a 900 year coal supply left over. Yes, the "New Horizons for Coal" are limitless. You

cannot see the end! In the coal industry there has indeed been a shotgun wedding between "Resources and Technology" and we believe we are unbeatable "Partners with Progress"—a successful marriage that no man can put asunder.

(1) Source: American Gas Association and American Petroleum Institute.

(2) Source: American Gas Association and American Petroleum Institute.

* An address by Mr. Hall before the Financial Analysts Federation 1967 Fall Conference, sponsored by the Toronto Financial Analysts Society, Toronto, Canada.

GOVERNMENT EXHIBIT 247

BARRON'S

National Business and Financial Weekly

50 Cents October 13, 1969

NATURAL GAS FIASCO

Federal Price-Fixing Is Finally Producing a Shortage

EL PASO Natural Gas Co., which (according to an article in Barron's barely six months ago) was supposed to be "Making Fewer Headlines, More Money," last week made quite a splash on the financial page. The company announced that it has signed with Sonatrach, Algeria's state-owned petroleum monopoly, "definitive agreements for the largest liquefied natural gas (LNG) project in history," one which involves capital outlays of nearly $1 billion and is designed, starting in the fall of 1973 and extending nearly to the end of the century, to deliver one billion cubic feet of fuel per day to East Coast ports. Besides pipelines and the like, the project calls for the construction of liquefaction and regasification plants, as well as nearly a dozen specially designed vessels, biggest of the kind ever built, to carry the frozen gas. "This will mark the first time that energy supplies of this type have been imported into the U.S. on a permanent basis," the company proudly observed, adding that it was "particularly pleased to be associated with this pioneering venture. . . ."

* * * *

Apart from its unprecedented size and scope, the project is noteworthy on a number of counts. For one thing, if carried out faithfully by both parties, the contract will mark a welcome change in the commercial practices of the Algerian Government, which up to now have smacked less of the Harvard Business School than of the Barbary Pirates. Since gaining independence a decade ago, Algeria has seized without compensation a vast amount of foreign property, including banks, insurance companies

and the personal possessions of thousands of former French residents. Sonatrach—Societe Nationale pour la Recherche, le Transport, la Transformation et la Commercialization des Hydrocarbures—launched its career three years ago by borrowing $15 million from a couple of gullible U.S. banks. No sooner had the ink dried on the loan agreement than Algeria began pressuring the American oil concerns on the scene to submit to discriminatory treatment regarding royalties and taxes. Since then Algiers (which broke off diplomatic relations with Washington during the last Israeli-Arab War) has "sequestered," or confiscated, the bulk of U.S. investment within its borders, including concessions held by El Paso Natural Gas. "Never do business with a man you can't trust," advised J. P. Morgan, but the old man has been dead a long time. Perhaps the company will come out all right.

That's the stockholders' worry. Profitable or otherwise, the huge transaction, which last week's announcement said was "designed to ease U.S. gas supply problems," has disturbing significance for the whole country. For it plainly indicates that domestic reserves of the useful and versatile fuel, once deemed inexhaustible, are not keeping pace with future needs, an alarming state of affairs which the Federal Power Commission belatedly has come to recognize. Just a fortnight ago, the FPC, which regulates interstate distribution of natural gas from wellhead to burner tip, released a staff report on supply and demand, warning that within the next five years—sooner in some areas—a critical nationwide shortage will flare. What the agency failed to point out is that its own regulatory policies, by deliberately (if not with malice aforethought) imposing an artificial lid on prices, have been largely to blame. Price control will always have its blind worshipers (hi there, Professor Galbraith). Only the free market, however, can keep the home fires burning.

For the past 15 years, to be sure, the regulatory bodies have been singing a different tune. In 1954, the U.S. Supreme Court, in a singularly ill-advised decision, thrust on the Federal Power Commission authority to regulate not only transmission and distribution companies but also

producers of natural gas. Since then, despite protracted litigation, the FPC has gradually extended its sway. The agency has decreed, beyond further legal appeal, area prices of approximately 15.5 cents per thousand cubic feet of gas for the Permian Basin. (Ceiling prices for all other major areas are still in dispute.) The ceiling for Southern Louisiana was finally set by the FPC at nearly five cents per mcf., or 20%, below the provisional guideline posted eight years earlier. As in the Permian Basin rate case, moreover, the FPC employed in its calculations 1960 cost figures, which it so far has refused to up-date. Thus, according to Stanley Learned, director and former president of Phillips Petroleum, the government has "established a concept for producer prices under which the industry cannot recover its costs."

Such policies have naturally warmed the hearts of users. However, producers, discouraged by lack of incentive, have sharply curtailed their efforts. Completions of U.S. exploratory gas and condensate wells declined from 909 in 1959 to 429 in 1968. In the latter year, for the first time in history, net production exceeded additions to reserves. The reserves-to-production (or R/P) ratio today stands at only 14.6, or considerably less than a 15-year supply, barely two-thirds of what it was when the FPC acquired jurisdiction. Some pipelines are unable to contract for future needs; hence, expansion programs are in jeopardy. Now El Paso Natural Gas Co. has decided to go four thousand miles overseas for fuel which will cost more than 50 cents per mcf., perhaps half again as much as gas moved by pipeline from the Gulf Coast.

Even the federal regulators, as noted, have finally grown concerned over what they have wrought. Early this month the FPC issued a staff report that didn't make pleasant reading for the boss. In brief, it concluded that the national reserves-to-production ratio would decline to 10.2 by the end of 1973. "Even a substantial improvement in reserve additions above that experienced during the past five years will not prevent the R/P ratio from dropping to about 11." Regional gas supply deficiencies are likely. "The uncommitted portion of the total

proven reserve inventory will have been exhausted by 1974, at which time the natural gas industry's capacity for growth will be limited." None of the foregoing, said a miffed Commissioner, provides "the basis for a round of price increases." Nonetheless, the full Commission has swiftly moved to make a start. On October 3 the FPC decided to treat as new supplies (hence, worth more money) all gas henceforth discovered on acreage already committed to the interstate market. Last Tuesday in what the agency described as a "turning point" in regulation, it decided to liberalize the pricing of gas reserves which pipelines themselves own.

• • • •

Too little, say industry spokesmen, and too late. To meet the looming emergency, in the view of Phillips' Learned, the Commission must take more far-reaching steps, including reconsideration of its Southern Louisiana decision; approval of an increase of at least five cents per thousand cubic feet in both wellhead and flowing gas; and recognition in price-fixing of "changes in taxes and the results of inflation." For the long haul, Mr. Learned approvingly quotes the views of Dr. Clark A. Hawkins, associate professor of finance and economics at the University of Arizona, and authority on the subject. In a new book, the latter writes: "The market should be the mechanism for determining price because natural gas price fixing by governmental fiat is not only unnecessary but unworkable as presently attempted. Also, it is only the market that will give the lowest price consistent with maximum output in the long run. The standard of market price could be feasible under existing law if the Commission would espouse it and proceed to the courts." Failing that, of course, a Congress truly responsive to the needs of consumer and producer alike could undo the longstanding judicial mischief.

Like El Paso Natural Gas Co., we would be inclined to bet on the sorry status quo. The East Coast doubtless will come to rely for fuel on a source of supply that is unfriendly at best and, at the slightest provocation, downright hostile. As the U.S. proceeds to import natural gas

—at higher prices, be it noted, not lower—the poor old balance of payments will suffer a fresh, and wholly gratuitous, setback. "Economists," so Dr. Milton Friedman has said, "may not know much. But we do know one thing very well: how to produce shortages and surpluses. Do you want to produce a shortage of any product? Simply have government fix and enforce a legal maximum price on the product which is less than the price that otherwise would prevail. . . ." He should be teaching at Harvard.

GOVERNMENT EXHIBIT 253

———CCH———

NUCLEAR POWER ECONOMICS: 1968-1969

[¶ 3043]

Philip Sporn analyzes competition in power generation.—Reproduced below is the full text of a report prepared and submitted by Philip Sporn to the Joint Congressional Committee on Atomic Energy on the developments in nuclear power economics during the period from January 1968 through December 1969.

Mr. Sporn finds cause for concern in the increase in the costs of power generation from fossil fuels and particularly nuclear fueled plants. The increased costs of nuclear power, in Mr. Sporn's opinion, has greatly injured its competitive position, especially in view of the fact that such high economic hopes were held for it at its inception.

Developments in Nuclear Power Economics: January 1968—December 1969

Report Prepared for the Joint Committee on Atomic Energy by Philip Sporn, Retired President, Consultant American Electric Power Company

Part I

The Retrogression in the Competitive Position of Nuclear Power vis-a-vis Fossil-Fueled Power:

During the past two years there has taken place a remarkable and ominous retrogression in the economics of our nuclear power technology. The light-water-moderated reactor, which two years ago offered potentials for nuclear power generation competitive with fossil fuel at 22¢ to 24.8¢ per million Btu, has today lost position where it is competitive at 28¢ to 29.5¢ per million Btu fossil fuel cost.

This in turn makes it difficult to accept without something more than a grain of salt the statement of the Atomic Energy Commission [1] "the outlook for the future for nuclear power continues to be very promising (because) of the continuing economic competitiveness of nuclear power in spite of increasing costs as prices for both nuclear and fossil plants increase."

How did this come about? The reasons for that are many. Among the most important, but nowhere near all, are higher costs of nuclear components, higher cost of turbines, higher construction costs, continuing escalation during the entire construction period due to the inflationary cycle, longer construction time which results in higher interest and overhead charges, higher capacity charges in view of the current coupon rate of approximately 9.5% on AA utility bonds which brings the necessary capital charge to give an adequate return up to 16%, lower capacity factor due to the recognition that with the growth of atomic power which will take place between now and 1980 no atomic plant can, except for the shortest time, be expected to operate at a capacity factor as high as 80% and that, therefore, a more rational capacity factor is one five points lower, or 75%.

It is true that fossil fuel costs also have gone up, but even so, nuclear power has lost position vis-a-vis fossil fuel (mainly coal). This can be seen very clearly in Table 1, which shows costs of both coal-fired and nuclear-fueled plants, the former in terms of an 800-MW unit and the latter in terms of an 1100-MW unit, as of July 1, 1969, for completion in the case of nuclear in 1976, and in the case of coal in 1975. All the figures in that tabulation are significant and striking but two stand out in particular—the cost of switchboard delivered nuclear energy of 7.06 mills per KWh as against 6.65 mills for coal-fired energy with coal at 25¢ per million Btu. On the basis of these figures, the competitive break-even point for nuclear power is 29.7¢ per million Btu coal cost.

---

[1] *The Nuclear Industry*, 1969, page 11, U.S.A.E.C.

I believe these are in a sense idealized costs, but yet they have in them the element of being hardheaded and pragmatically attainable figures based upon achieving every legitimate economy.

I am further convinced of their soundness in the light of:

1. Actual costs of a nuclear project completed during the year involving a 600-MW unit where the capacity factor employed was higher—80%—and the capital charge lower—15% which yielded an expected production cost at the switchboard of slightly over 8 mills per KWh, and

2. On a second job undertaken during the past year and carefully evaluated where the nuclear unit was in the 800-MW range and where the capital charge employed was higher—16.6%—and the capacity factor was slightly higher, the expected levelized cost obtained was very close to 7.8 mills per KWh.

It is not surprising that all these developments have already had a significant effect on the recent experience of the nuclear industry. It has caused cancellation of one or two previously announced projects, delay in scheduling of other units committed for; it has brought about interposition of fossil fuel units to be completed ahead of what might have been scheduled atomic units, and in some cases it has brought about plain decisions to go fossil when, if things had gone differently, atomic units would have been orderd. In connection with the last, it needs to be pointed out that every time a fossil-fueled unit is ordered for whatever reason, where an atomic unit might have been ordered under conditions more favorable to nuclear power, the particular nuclear unit is lost for approximately 30 years.

• • • •

DEFENDANT'S EXHIBIT 1

October 9, 1957

Memorandum to: Mr. R. J. Hepburn

In connection with your memorandum of October 8, I am sorry that the underground miner did not perform. I believe this method of mining has a great future, but underground mining is not our business, and under the conditions, I think the only thing for us to do is to continue to wait until someone in the deep mining field produces a working machine and a workable system.

/s/ Frank Kolbe
President

DEFENDANT'S EXHIBIT 2

October 18, 1957

MR. F. F. KOLBE

Re: Northern States Power Company
Displacing gas with coal

We have had several discussions with Mr. Hoffman of the above company, trying to replace some of the gas they are burning with our coal moving in Midwest barges.

With their present gas contracts, they could consider displacing 600,000 MCF (approximately 75,000 tons of coal) now costing them 24.94¢ per million, and 800,000 MCF (approximately 100,000 tons of coal) costing them 23.9¢ per million. The average of these two is 24.4¢ per million. Unloading, storage, ash handling and all of the labor connected with handling coal versus gas—using a very reasonable figure by them—is placed at 1.4¢ per million.

This means we would have to sell this block of coal at 23¢ per million or $5.20 per ton inboard barges at their plant. Our total transportation cost at present is $2.12, leaving $3.08 f.o.b. mine for this 175,000 tons additional business.

Our present contracts with them we estimate will net us at the mine next year, with our present barge and rail rates, $3.986. The average price on the total tonnage would therefore be $3.67. Our portion of the above would be 150,000 tons at $3.986 and 87,500 tons at $3.08.

I have a date with Mr. Hoffman for Wednesday of next week and would like to talk with you before that time.

J. M. MORRIS

EW

DEFENDANT'S EXHIBIT 3

MID-WEST COAL PRODUCERS INSTITUTE, INC.
307 NORTH MICHIGAN AVENUE
CHICAGO 1, ILLINOIS
TELEPHONE CENTRAL 6-2755

A. J. CHRISTIANSEN
SECRETARY

June 19, 1958

Mr. A. H. Truax, Chairman
Truax-Traer Coal Company
111 North Wabash Avenue
Chicago 2, Illinois

Dear Harold:

Attached is copy of an excerpt from the opinion of Trial Examiner Francis L. Hall in one of the Tennessee gas cases consolidated with the Canadian gas cases, in which he comments on the position of coal in natural gas cases. This illustrates that coal is not going to get any help from the Federal Power Commission under the present laws, and that the coal industry is going to have to meet the competition of natural gas by their own marketing efforts, and that the railroads are in the same boat.

I thought you might like to look at this finding of the Examiner.

Yours very truly,

/s/ Andy
A. J. CHRISTIANSEN

AJC:MAT
Enclosure

cc: Mr. Frank Nugent
Mr. F. F. Kolbe

Excerpt
From the Opinion of
Trial Examiner Francis L. Hall

In the Matter of
Tennessee Gas Transmission Company
(Docket No. G-11107)

Opposition of Coal Intervenors

The Coal Intervenors, namely, National Coal Association, United Mine Workers of America, Fuels Research Council, Inc., Maher Coal Bureau, Anthracite Institute, Truax-Traer Coal Company, Baukol-Noonan, Inc., and Dakota Collieries, Inc., as representatives of competitive fuel, transportation and labor interests, presented extensive evidence in the consolidated proceeding in opposition to the expansion of natural gas service in the midwest. This presentation appears to be designed to show the impact of displacement of coal by natural gas in the competitive area and will be considered in detail in the Examiner's final decision dealing with the competitive issues.

However, in the event any part of the evidence presented by the Coal Intervenors be construed by them to relate to (1) the proposals in Docket G-11107, (2) the disposition herein made of the issues involved in this docket, or (3) the issues to be disposed of in other decisions to be issued by the Examiner prior to the final decision involving the competitive issues, the following considerations control the dispositions made.

Underneath the efforts of the Coal Intervenors is an understandable impulse to prevent competition and protect coal markets. Their position can best be understood by keeping two things in mind. First, that the coal industry is constantly competing with the suppliers of

---

[23] As one of the witnesses for the Coal Intervenors testified, "I think that coal in the future should expand, though probably a gradual rate, providing, of course, we have sound economic conditions for fuel development." Coal consumption in the United States in 1956 was the highest since 1931.

other forms of energy for the consumer's dollar and it is the needs and wants of the consumer, not the actions of a regulatory commission, that determines, or should determine the extent to which a particular industry shall prosper.

In this day and time people do things differently and better. They prefer the modern way of life and its conveniences and are mindful of the fact that gas has brought greater prosperity and better standards of living. Unless there exists in the consumer's mind an atmosphere favorable to a particular fuel sale, the sale becomes impossible in a competitive market. Accordingly, for the coal industry or any other fuel industry to win the competitive sales battle it must give fuel consumers a better reason for buying its product.[24]

---

[24] The one factor which is perhaps giving natural gas distributors their greatest concern today is the skyrocketing prices paid to producers for, as hereinabove indicated, a continuation of such increases could push the cost of gas to the point where the average consumer cannot afford to pay for it or convert to its use. This factor, however, can be controlled by the Commission in appropriate circumstances (*Signal* case, *supra*) and may have to be controlled to prevent nullification of the "primary aim" of the statute which is "to protect consumers against exploitation at the hands of natural gas companies" (*F.P.C.* v. *Home Natural Gas Co.*, 380 U.S. 591, 610; *Phillips Petroleum Co.* v. *Wisconsin*, 347 U.S. 672, 685). Whether the Commission can or should exercise its discretion in a certificate proceeding to keep producer prices down to the point where they will not exceed average field prices is one of the issues presently pending for decision before the United States Circuit Court of Appeals for the Third Circuit in *Public Service Commission of the State of New York, et al.* v. *F.P.C.*, Nos. 12,401 and 12,403. This case involves the contract price for CATCO gas reserves acquired by Tennessee as a part of its over-all gas supply relied on in Docket G-11107 (17 F.P.C. 732, 890).

It would appear that every increase in the field price of gas that is allowed to become effective will prove to be another shot in the arm for the coal and other fuel industries and a darkening cloud for the pipelines, distributors and consumers.

Under no circumstances should the producer's appetite for higher field prices be permitted to become a pit into which any segment of the industry may fall. Stated another way, the profit sheet of the producer is not the only yardstick of a healthy industry, for now that billions of dollars have been invested the investments must

Obvious factors account for the ascending demand for natural gas for both home and industry use. Gas rather than some other fuel has carried a greater selling power in the home because of its convenience, cleanliness, laborless features, and the further fact that up until now it has generally been cheaper than other fuels. Where industry has converted to the use of natural gas it has done so to reduce costs, improve products and processing methods, and develop new products.

The coal industry's drumfire of opposition has been aimed at practically every expansion of natural gas service, for such industry has been and continues to be alarmed about encroachments of natural gas upon coal markets. While no one would care to minimize the inconvenience of having the coal industry's plans upset, there are nevertheless some actions that have to be taken by a regulatory agency for the good of a community, area or the country as a whole, regardless of how painful they may be to a particular industry or part of an industry. Any decision enabling expansion of the natural gas industry may cause some distress to coal and other fuel industries. But this is the price which must be paid for continued growth. And it is necessary to pay the price for the sake of the future as well as the present.

So the question facing the Commission in certificate cases is not whether some part of a fuel industry or industries is to be saved. Rather it is a question of whether the Commission, with knowledge of the contribution which natural gas has made to this country's progress, should continue to build for the future as well as the present. It need not heed the special interests that are most vocal on issues of this sort. What it must realize is that a vast host of consumers who had little or nothing to say on the subject at the hearing are depending upon it to raise its sights above narrow considerations to the major interest of the United States.

---

be protected and dependable markets assured. A continuation of higher field prices can only mean that pipeline companies and distributors will find their profit margins pinched between higher costs and consumer resistance to price increases.

The essential role of the Commission in this area of the natural gas business is to assure adequate service to the public and to protect consumers, not force or regulate them into using other fuels against their will. The coal industry, like any other industry, must face and solve every problem in its field. It must also recognize natural gas as one competitor among others and find its proper role in the total fuel supply picture. "The Natural Gas Act does not confer authority upon the Commission to promulgate a national fuels policy, or to assign 'zones of influence of operation' to natural gas or to any other fuels. The Commission's jurisdictional orbit is delineated by the requirements of public convenience and necessity." *Scranton-Spring Brook Water Co.*, 17 F.P.C. 25, 35; affirmed, 17 F.P.C. 38.

DEFENDANT'S EXHIBIT 4

THE UNITED ELECTRIC COAL COMPANIES
307 North Michigan Avenue
Chicago 1, Illinois

July 1, 1958

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Frank:

I spoke to you last night about an acreage of No. 9 seam coal controlled by Edwin Ruby and his associates in the Hopkins County Coal Company.

In 1954 he had Mr. Davis Read make a report on this acreage, copy of which I am enclosing, and after it has served your purpose, will you please return it to me.

At that time we were considering mining the No. 11 and No. 9 seams at the same time and using the washing plant to handle both coals on two shifts. However, the market was not such that we could justify two-shift production and the No. 11 seam strip coal controlled by Ruby will be exhausted in another year or eighteen months.

They are not underground people and hesitate to make the necessary investment to mine this underground coal. The tipple and washing plant, of course, is right on the property and could be purchased by anyone interested on a very reasonable basis. The reserves they control approximate six million tons and the cost estimate made by Mr. Read in 1954 would have to be revised to current wage rates.

We receive reports from the Kentucky Coal Agency on production and realization. For the calendar year 1957, washed No. 9 coal shows a realization of $3.5567 per ton. I am sure, however, that all companies did not report. The total reported shows 1,799,415 tons whereas the

total production of No. 9 washed coal, including Ken, DeKoven, Uniontown and West Kentucky Coal Company's properties, was about five million tons. The realization figure named, however, would be somewhat of a guide as to expectation as to return for the coal.

I thought you might be interested in looking over Mr. Read's report and later we might discuss it if the matter appears desirable.

Yours very truly,

/s/ J. M. Morris

EW

DEFENDANT'S EXHIBIT 5

July 11, 1958

Mr. F. F. Kolbe:

I am attaching a memorandum I asked Mr. Latimer to prepare on a *possible deep coal field in and around DuQuoin.* This field, marked in orange on the attached map, as far as we know has not been taken up. You can see from the drill holes on the north line of the Beaucoup field that the coal is running from 6½′ to 8′ in thickness.

Tom has explained in his letter what it might cost to pick up a field of this type, and I am wondering if we shouldn't give some consideration to adding to our reserves for at least the next five years. Five thousand acres would be carried for five years for $5,000 an acre.

This area, of course, is north and east of Pineyville and about north of DuQuoin.

/s/ R. J. Hepburn

RJH:J
Attach.

July 11th
1958

Mr. R. J. Hepburn

Deep Coal Reserves in Southern Illinois

As we are all aware, during the past few years practically all of the underground reserves of coal in a band several miles wide, from Belleville southeast to DuQuoin have been tied up by Peabody, Truax-Traer, Ayrshire and the Beaucoup Field. This coal is all tributary to the St. Louis & Belleville, M.P., O.M. & O. and I.C. railroads and the Kaskaskia, Big Muddy and Beaucoup canal projects.

Northeast, East and Southeast of DuQuoin, most of the known reserves of easily workable coal are also in the hands of operators with the exception of certain comparatively small blocks which are not too desirable for various reasons. There are few places left in this area tributary to the proposed canals, but immediately adjoining the Beaucoup Field on the North there is apparently a block of coal consisting of about 100 square miles of #6 coal unbroken by any known cutouts. Of course, only drilling can prove it, but there could easily be 640,000,000 tons in *Place* in this area, which is shown on the attached map.

This coal is rather sketchily proven by a line of drill holes across the North portion of the Beaucoup Field on the South. This line shows coal running from 5′ 1″ to 8′ in thickness, under from 172′ to 233′ of cover. The altitude of the coal seam varies from 251′ to 293′. At the Northwest corner of the tract at Nashville, the old Clemison mine operated in an average of about 6′ of coal at a depth of 407′, coal altitude 101′. At the Northeast corner at Ashley #3, 5′ thick was mined at a depth of 492′, coal altitude 52′. At Dubois, three miles North of the Southeast corner, coal over 6′ thick has been mined under 290′ of cover, coal altitude 223′. A cut-out runs across the North end of the block from Nashville to Ashley. The dip of the coal from South to North is quite gentle, perhaps in no case exceeding 25′ to the mile. Mining

conditions are, of course, not known definitely due to the lack of drilling, but should be fair to good.

Quality should be about the same as Fidelity.

A mine on the Southern edge of this field would be 8½ miles North of the Beaucoup canal at Pinekneyville, and a privately owned railroad would have to cross the M.R. and the I.C. Grades would be easy and favorable to the lands most of the distance, and a truck road could be built without any unusual expense.

I believe that a selected area within the above tract could be picked up on options to purchase at $50.00 per acre, or perhaps slightly higher in some cases. Paying $1.00 an acre at the time of signing the contract and a like amount each year for not over four years with the final payment coming due at the end of 5. Of course, the shorter the option period the easier it is to obtain contracts. Also, I think it would be well after some drilling has been done to buy a few of the difficult tracts at from $15.00 to $25.00 or $50.00 per acre. This has been done by some of our competitors with good results. Leases from 3¢ to 5¢ per ton will no doubt seem attractive to some of the land owners.

There is a small oil field along the Eastern portion of part of this field and all of those people will want to retain their oil rights.

I would also like to call attention to the Northwestern Railroad holdings over near Staunton on the O. H. & O. I have been told that this coal is not now on the market, but it might be, as it extends to Brighton which is about ten miles from the Illinois River, North of Alton. I do not believe a railroad would be practical to take this coal to the river because of the topography, although a route might be found where a belt line would be practical.

T. H. Latimer

THL/ah

DEFENDANT'S EXHIBIT 6

August 4, 1958

Mr. Justin Potter
Kentucky Store and Land Company
Crofton, Kentucky

Dear Jet:

I appreciate your desire to do something with the Buffalo Creek mine. However, we have so much money invested it it that we do not like to give it up until we have exhausted all our possibilities. In addition to drilling in the neighborhood, we are also trying to work out some machinery layout that would enable us to continue in business. All of these things involve a lot of thought, particularly as the property is so difficult that our solutions are apt to be unorthodox.

In regard to your property adjoining the Jenkins leases, we can not, of course, ask you to hold this until we are able to offer you a firm proposition on it, so it is all right with us for you to go ahead and make the best possible arrangement. I hope, however, that any arrangement you make will not be such as to hurt the property for some later more complete operation.

If you know of anyone who could operate our Buffalo Creek property and has the underground equipment to do it, we would be very willing to talk with them ourselves.

Incidentally, we believe that if a large investment at the present time is justified in Number Six coal, we and West Kentucky Coal Company could make a combined venture a profitable one. I have written to them about this but so far have not heard from them.

Very sincerely yours,

President

DEFENDANT'S EXHIBIT 7

WALL STREET JOURNAL

Friday, November 21, 1958

BUSINESS MILESTONES

• • • •

GENERAL DYNAMICS SEEKS TO ACQUIRE CHICAGO BUILDING SUPPLY FIRM

A WALL STREET JOURNAL *News Roundup*

General Dynamics Corp. is dickering to acquire Material Service Corp., a Chicago-based building supply and mining company.

Spokesmen for both concerns said that a possible merger of Material Service into General Dynamics has been under study for several months. They declined to forecast how soon a decision might be reached.

General Dynamics has been striving to build up its civilian business, and a merger with Material Service would mark its entry into the building supply field. General Dynamics is a leading maker of aircraft, submarines, missiles, and other defense products.

Material Service is controlled by Chicago industrialist Henry Crown, who owns the Empire State Building in New York and has varied other holdings. He is a vice president, director and member of the executive committee of Hilton Hotels Corp., as well as chairman of Material Service.

The Chicago company quarries limestone and produces sand, gravel, lime, concrete and aggregate, and mines coal. Its properties are located in Illinois, Indiana, Missouri and Utah. The concern also operates barges and towboats and holds about 25% interest in United Electric Coal Co.

Material Service earned $7,142,166, equal to $93.31 a share, on net sales of $103,405,938 in 1957. Its stock

is traded over-the-counter and it had 150 stockholders and 76,543 shares outstanding at the end of 1957. Assets at last December 31 totaled $81,457,415.

General Dynamics earned $44,278,763, or $4.80 a common share, on net sales of $1,562,538,900 in 1957. For the nine months ended September 30, the company earned $28,740,152, or $2.92 a common share, on consolidated sales of $1,153,498,834. Assets at last December 31 were $570,604,595.

"Should anything develop as a result of current discussions," General Dynamics said, "no change in personnel or conduct of business of Material Service Corp. is contemplated.

DEFENDANT'S EXHIBIT 8

GEO. ROBERT BOLLER
Suite 1090 - 407 South Dearborn Street
Chicago 5, Illinois • WAbash 2-8239

Management Consultant

December 11, 1958

Mr. F. F. Kolbe, President
United Electric Coal Company
307 North Michigan Avenue
Chicago, Illinois

Dear Mr. Kolbe:

The enclosed brochure on the Norris City, Illinois coal mining properties is submitted to you for the purpose of allowing your company to determine its interest in the purchase of the property.

This mine as well as the long term coal rights have been owned by my father for a number of years. He formerly owned a number of mines but has not been active in the mining business for many years. Because of his age it seems far more desirable for him to consider the sale of the property rather than to attempt to reopen the mine himself.

My father would consider a cash sale or an arrangement based on stock ownership in your company or possibly a minimum annual installment sale payment if it appears to be mutually advantageous.

I would appreciate your comments as to your company's potential interest in the acquisition of these extensive coal reserves.

Very truly yours,

/s/ Geo. Robert Boller
GEO. ROBERT BOLLER

May 4, 1959

Mr. Geo. Robert Boller
Suite 1090
407 South Dearborn Street
Chicago 5, Illinois

Dear Mr. Boller:

As you requested on May 10, we are returning to you the brochure on Norris City, Illinois coal mining properties, which you submitted to Mr. Kolbe in December.

Mr. Kolbe has asked me to thank you very much for giving United Electric the opportunity to consider these properties, and to tell you that at this time our work is entirely in the strip mining field, so we have no present place for this kind of mining in our operations.

I regret that it has taken so long for me to locate this brochure for you.

Sincerely,

Secretary to Mr. Kolbe

PAM
mf

DEFENDANT'S EXHIBIT 9

February 5, 1959

Mr. Frank F. Kolbe, President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Dear Frank:

We have your proposed plan for Buffalo Creek, and it appears that the entire project revolves around the question as to whether or not you can maintain a price of $6.25 for #6 seam coal, and if that is possible, that your net earnings for the next ten years will range from $1.00 to $1.32 a ton. I question very much that a $6.25 realization can be maintained on #6 seam coal in face of a declining market for premium grade household stoker coal.

Yours very truly,

FREEMAN COAL MINING
CORPORATION
FRANK NUGENT
President

FN/or

DEFENDANT'S EXHIBIT 11

May 27, 1959
(Dictated 5/26)

Mr. F. F. Kolbe:

Mr. Inman has given Mr. Utterback some figures on the *Industry field.*

We control a little over 3,000 acres, 2,500 of which are coal acres, giving us approximately nine million tons of coal. We feel that in our immediate area south and east of us there would be another 2,000 acres containing seven million tons. The ratio, however, would be from 30-35 to 1. We don't feel that this coal is continuous but somewhat like our present Buckheart field. I don't believe anyone will bother the tonnage in this area. However, with ratios of 35-40 to 1, I think this coal would run on southeast practically to Rushville. On the west and north a cutout appears which might be four or five miles in width, and the coal picks up again around Augusta.

We will explore this field to see what we can put together, but I do feel that we can figure on an additional seven million tons at our present location.

R. J. HEPBURN

RJH:J

DEFENDANT'S EXHIBIT 12

PAUL WEIR COMPANY
INCOPORATED
MINING ENGINEERS AND GEOLOGISTS
DESIGN AND CONSTRUCTION

October 2, 1959

Mr. Frank F. Kolbe, President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Dear Mr. Kolbe:

Before giving you our preliminary opinion in summary form on values of plant, equipment and recoverable coal reserves at active operations, also on values of recoverable coal reserves at inactive properties, we define what the values we assign to active properties represent.

The "value" of an active coal mine property, exclusive of salvage value, is that amount on which from the aggregate net cash generation (after-tax income plus depreciation plus sustained depletion less assumed cost of working capital less estimated necessary reinvestment in plant, equipment and coal reserves) there can be provided an adequate annual rate of interest return and have remaining from such net cash generation an amount which if invested at the end of each year to return the same adequate annual rate of interest will in the aggregate during the life of the recoverable coal reserves equal the "value". The salvage value to be added is the present worth of the estimated salvage value at the end of operations, discounted at the same adequate annual rate of interest.

Stated differently, we can consider the "value" to equal that principal amount of "borrowed money" that can be repaid with an adequate interest return out of the aggregate of net cash generation during the life of the recoverable coal reserves by applying the annual cash

generation at the end of each year, first, to interest on the unpaid balance of the principal and, second, to the reduction of the unpaid balance of the principal amount.

In estimating the after-tax income, no credit is taken for interest paid on borrowed money. The values are arrived at independently of the financing.

The "adequate" rate of interest return that we employ is ten percent annually. We believe that under present conditions and considering the risks inherent in coal mining, this is reasonable.

Unless otherwise noted, the assigned values are as of December 31, 1958.

ACTIVE MINES

Buckheart

Plant, Equipment and Coal Reserves, including Railroad and River Terminal	$7,042,490
Present worth of Estimated Salvage Value	158,272
	7,200,762
Depreciated book values 12/31/1958, Plant, Equipment and Coal Reserves	5,140,875
Appreciation	$2,059,887
Future stripping ratio 14:1	

Cuba

Plant, Equipment and Coal Reserves, including new Kolbe Wheel	$3,319,353
Present worth of Estimated Salvage Value	718,424
	4,037,777
Depreciated book values 12/31/1958, Plant, Equipment and Coal Reserves	1,259,111
New Kolbe Wheel	1,887,000
	$3,146,111
Appreciation	$ 891,666
Future stripping ratio 18:1	

Fidelity

Plant, Equipment and Coal Reserves	$3,966,819
Present worth of Estimated Salvage Value	46,150
	$4,012,969

Depreciated book values 12/31/1958, Plant, Equipment and Coal Reserves (including Clinch)	$4,016,765
Future stripping ratio 10:1	

Mary Moore

As of December 31, 1958 the estimated recoverable coal reserves were 538,000 tons. As of July 31, 1958 the depreciated investment in plant and equipment was $428,-927. As of December 31, 1958 this had decreased to approximately $393,534. The depleted investment in coal rights as of that date was $25,781. The cash generation from the remaining two years of operations subsequent to December 31, 1958 should be sufficient to extinguish the investment accounts, probably with a small overplus.

Plant, Equipment and Coal Reserves	$467,495
Present worth of Estimated Salvage Value	150,262
	617,757
Depreciated book value 12/31/1958, Plant Equipment and Coal Reserves	$419,315
Appreciation	$198,442

INACTIVE COAL RESERVES

The value of inactive coal reserves may be determined in one of several ways. If the quantity of contiguous recoverable coal reserves in an area is sufficient to provide for the development of a mine, the value is the present worth of the probable value per ton at time development fits into a planned schedule. United Electric has three such areas or fields, namely, North Canton, Glasford-Banner and Industry-McDonough County. We will consider these separately.

North Canton

The extent of this field, which is No. 6 coal with an estimated overburden ratio of 16:1, is substantial. As of December 31, 1958 United Electric owned in fee and/or held under contract an estimated 8,231,630 tons of re-

coverable coal. The acquisition cost is $1,185,368. This represents a per-ton cost of $0.1440. From our studies of results from Buckheart and Cuba, we have concluded that at these two active operations coal reserves have a present value of approximately $0.20 per ton. If these reserves are to be developed as a successor operation to Cuba some six or seven years hence, the carrying charges on $0.1440 per ton would increase the cost to an amount in excess of $0.20 per ton. There is a potential of 17,000,000 tons in addition to the reserves presently controlled in this field. The overall size is substantial.

In our opinion, the purchase price of $0.1440 per ton represents the value as of December 31, 1958.

Glasford-Banner

As of December 31, 1958 United Electric had purchase contracts covering an estimated 3,421,921 tons of recoverable coal in this field in which the total quantity recoverable from the two seams is estimated to approximate 17,000,000 tons. As of the same date an additional estimated 912,079 tons were held under lease. The coal from this field has an added value because the inherent quality is superior to that of Fulton County No. 5 and No. 6 coals. Additionally, the field is located along the Illinois River. The cleaned coal can be loaded into barges directly from the preparation plant. However, the two seams, one underlying the other, are thin and the overburden ratio is estimated to be 17:1.

We have studied the reports prepared by United Electric's staff, dated April 23, 1959. We note that the projected total costs are approximately equal to present total costs at Buckheart, Cuba and Fidelity. We note also that the projected sales realization is $5.27 per ton and, further, that the projected net after tax profit is $1.17 per ton. Such a profit represents in excess of a 40 percent return on invested capital. Also it represents in excess of 22 percent of the sales realization. The sales realization of Buckheart coal for the fiscal year 1959 was $4.45 per ton. This approximates the realization per ton f.o.b. barges.

The analyses of clean coal presented in the report show a moisture content that appears to us to be less than that of the inherent or bed moisture although no thermal drying is proposed for the projected preparation plant.

The production and marketing of this coal presents special problems. The projections in the staff report are, in our opinion, on the very optimistic side in spite of the several advantageous factors. Further, we would expect actual results to be closer to those at Buckheart than those projected.

Our opinion of the present value of the coal reserves owned in fee as of December 31, 1958 is $0.30 per ton. This assumes immediate development. The coal reserves leased at a royalty rate of $0.25 per ton have an overriding value of approximately $0.10 per ton at time of mining. The present value would be the $0.10 per ton discounted at 10 percent for the number of years that elapse until the leased coal is recovered.

Industry-McDonough County

As of December 31, 1958, United Electric owned in fee and held under purchase contract a total of 8,976,117 tons of strippable coal reserves in this field. The seam is the Illinois No. 2 with a thickness of approximately 28 inches. The stripping ratio on the reserves as of December 31, 1958 approximates 21:1. United Electric's engineers advise that there are an additional 7,000,000 tons available at a ratio of approximately 30:1. The consideration for the holdings was $597,250. This represents an average cost of $0.0665 per ton.

We are not informed on the probable time of development of this field. However, we do have a United Electric staff report dated July 1959 in which projections are made and estimates presented. These estimates are similar to those prepared for Glasford-Banner.

The two advantageous factors that prevail at Glasford-Banner are present in the Industry field but have a lesser value. These are the better quality of coal than that of Fulton County No. 5, although the quality is probably not as high as that of Glasford-Banner. The

location of the field is substantially further from the Illinois River than is Buckheart.

The adverse factor in this field is the stripping ratio of 25:1 and probably as much as 30:1. There are two fields in the tri-state district of Illinois-Indiana-West Kentucky in which stripping is carried on with a stripping ratio of approximately 20:1. One is in the thin coal fields of Northern Illinois and the other is in the Linton-Sullivan field in Indiana. The Northern Illinois operations are economically successful because of geographical location in respect to markets. Those in the Linton-Sullivan field are of a marginal nature. We are of the opinion that the development of the Industry field as of the present would be unprofitable. However, a decade hence the chances for a profitable development would be much improved.

In our opinion, the purchase price of $0.0665 per ton represents the value as of December 31, 1958.

Gayle and Clinch

We considered the Clinch coal reserves to be part of those assigned to Fidelity and their book value is included in the Fidelity book value.

United Electric has a substantial investment in the estimated 1,714,710 tons of recoverable coal reserves designated as Gayle. This is an isolated area with a probable stripping ratio of 9:1. Of the total reserves, 785,773 tons, the book value of which is $145,886, is owned in fee. This amounts to $0.186 per ton. The remainder of the reserves are leased at a royalty rate of $0.05 per ton. No special value attaches to the Gayle reserves. On the contrary, they have a lesser value than those at Fidelity because of the isolation. We are of the opinion that the present value of the total is $72,000.

Le Flore

The estimated 2,301,872 tons in this field were purchased for $45,125. Based on our familiarity with the Eastern Oklahoma area, we are of the opinion that the value is represented by the purchase price of $45,125.

The coal is not of metallurgical grade. The quantity of strippable coal available in the area is probably insufficient for an economical development.

West Kentucky

Included under this designation are coal reserves at Buffalo Creek No. 2, strip and underground, and underground reserves at Mine No. 21. Active operations have been and/or are being abandoned because of the limitations of existing uncovering equipment when working in a stripping ratio of 21:1. The coal reserves considered to be recoverable by stripping with suitable equipment are estimated to be 2,500,000 tons. The coal reserves recoverable by underground mining are estimated to be approximately 10,000,000 tons. Only approximately 4 percent of the total is owned in fee. The remainder is held under lease. The value of the holdings as of December 31, 1958 is nominal. The depreciated book value of plant and equipment at Mines Nos. 19 and 21 as of December 31, 1958 was $218,757. In our opinion, this amount represents a reasonable salvage value of plant and equipment.

Southern Illinois
Underground

These coal reserves formerly owned by Union Electric Company consist of an estimated 551,800 tons owned in fee and 4,562,380 tons held under lease. The value of these reserves is nominal.

SUMMARY

Our present effort is confined to giving you our considered opinion on value of major magnitude. Certainly there are miscellaneous items such as office furniture and equipment, automobiles used by administrative officers and salesmen, odd pieces of surface lands not connected with active operations, farm lands, etc. The total value of these is small in relation to the active properties.

We have built up a very considerable amount of data that has been used as the basis for our values. After you have reviewed this letter, we will be glad to discuss in detail any questions you may have.

Respectfully submitted,

/s/ Paul Weir

PW:L

DEFENDANT'S EXHIBIT 13

May 27th
1960

Mr. R. J. Hepburn

In regard to acquiring coal lands near our own property, I would like to point out to you two of our most serious past errors, of which you may not be completely aware.

In 1939 and 1940, George Campbell of Old Ben, had practically everything at Cuba north of Slug Run under option. This went far enough with them to thoroughly drill, survey, and stake out their railroad yard and tipple. The options were dropped even though they were extended for a few months. Our officials were only vaguely aware of this. When they were finally dropped, one of the land owners wrote in to us and asked us to come in. We did this despite the opposition of the then head of the operating department. Every ton we have mined at Cuba since January 1, 1946 and all we have left was either under option to them or blocked off from us. We also turned down the entire Morgan Coal Company field which they had required due to the stupidity of our then superintendent. All of this except a few thousand tons was under 40' or less of overburden.

In the 40's our lack of aggression placed us in trouble at Buckheart. Ayrshire came in and acquired 8,500,000 tons. We had been approached by two real estate men in Canton, Carver and Orendorff, who were working with John Organ who had drilled the area for [Illegible] Collieries. They wanted a $40,000 fee for taking up the options, and the total cost would have been $450,000.00. No contract was made and we made no serious attempt to secure options until after Ayrshire started working. Certain of these were dropped even then because of lack of solid coal. Among those drilled and dropped were Floyd Shelby, Fluke, Tendick, Woods, and Sharron McLouth. We were practically cut off from our holdings in the north area except for a right-of-way. We acquired the Orendorff property by out bidding Ayrshire. The

ownership in the field then made a settlement necessary. We acquired their 8,500,000 tons in 1948 for $1,800,000.00 plus royalty on one property. Had we not out bid them for Orendorff, we would not have had an operation north of the entrance road to the mine, with the exception of the Seebree and Spenny proportion and they would have acquired the rest of the north area.

T. H. LATIMER

THL/ah

DEFENDANT'S EXHIBIT 14

cc: Mr. T. C. Tarzy
Mr. E. C. Butler

August 23, 1960

Mr. C. Evans Parks, Vice President
Iowa Southern Utilities Company
Centerville, Iowa

Dear Mr. Parks:

It was very nice to have an opportunity of meeting you yesterday and we do appreciate the courtesy and consideration shown us. I wish you would convey our thanks to Mr. Shutts, Mr. Mann and Mr. McLeod.

First, I have started some investigation into the possibility of underground mining in line with your interest in this, as well as other utility buyers and the committee appointed by your Governor. I can readily realize the importance to the State of Iowa and to communities to develop this industry as a help to the economy of the State as well as utility companies operating in Iowa.

If it appears that underground mining is economically feasible, I am sure we would be interested, with our related company, as outlined in our conversation.

You asked me to send you some typical long-term contract agreements, which I am including herewith. These are listed as follows:

1. Standard Coal Contract
2. Agreement with Union Electric Company
3. Agreement with Commonwealth Edison Company
4. Agreement with Wisconsin Power and Light Company

No. 1 is a standard form developed by the National Purchasing Agents Association, various coal-buying executives and representatives of the coal industry. This is used except where some special situation exists and the Buyer prefers to have his own legal department draw up the contract.

No. 2 is an agreement between Union Electric Company, Buyer and Truax-Traer Coal Company and our com-

pany, Sellers. This one, I believe, is self-explanatory and a study of it will disclose the provisions for escalation, renegotiation and gross inequities that might develop over the period of the contract.

No. 3, as indicated, is an agreement with Commonwealth Edison Company and covers the required escalation provisions in a somewhat different manner than No. 2.

No. 4 is an agreement with Wisconsin Power and Light Company and again the escalation provision follows a somewhat different pattern.

Prices have been deleted, as we feel our customers would prefer that this information should only be disclosed by them.

You understand that these contracts cover coal that is being produced by mines that were already in existence and had been operating for some time. In other words, investments had been made, the acreage was available and we had the productive capacity already installed and were looking forward to a place to sell the coal.

In considering a completely new operation, we would of course want a backlog of tonnage assured before making the investment and I am sure that in discussion we could develop the type of contract that would be acceptable to both you, the Buyer and our company, the Seller.

We are particularly interested in providing a dependable source of supply at a fair price to you, having in mind that if underground mining does not prove feasible, sometime in the future—with the utility growth in your State—coal from Illinois may become attractive to you, particularly for a guaranteed, adequate source of supply.

We will continue our efforts to develop strip mining in Iowa in locations that could serve your plants and certainly will keep you informed of anything that we may find.

Thank you for your time and courtesy and I hope to see you again before too long.

With kindest regards,

Yours very truly,

JMM:MW

DEFENDANT'S EXHIBIT 15

September 7, 1960

Mr. H. L. Mann, President
Iowa Southern Utilities Company
Centerville, Iowa

Dear Mr. Mann:

I did not forget about our discussion concerning the Iowa coal situation when we had our visit the latter part of August.

You will recall I mentioned the close association between our Company and the Freeman Coal Mining Company, which is a Division of General Dynamics Corporation. We operate only strip mines and have no experience or organization familiar with underground mining. Freeman, however, is one of the most successful companies in the Midwest operating underground coal mines.

I know your interest in developing coal in Iowa if at all possible, and this probably would mean serious consideration of underground mining. I have discussed this with the President, Mr. Frank Nugent, of the Freeman Company.

Some years ago they made a study of some coal lands owned by the Rock Island Railroad and at that time decided the roof and other conditions made the proposition uninteresting to them. A lot of changes have occurred, of course, in the past few years in both underground and strip mining methods. Freeman would be glad to send one of their engineers out to look the field over again if you think it desirable.

I would be glad to hear from you in this regard and will be governed by your wishes in the matter.

We are still investigating the possibility of stripping some coal on a small scale, and as this progresses, I will be glad to report to you.

With kindest regards,

Yours very truly,

JMM:J

cc: Mr. C. E. Parks, Vice President

DEFENDANT'S EXHIBIT 16

IOWA SOUTHERN UTILITIES COMPANY

Centerville, Iowa

September 13, 1960

Mr. J. M. Morris, President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Dear Mr. Morris:

I have delayed answering your letter of September 9 to get some additional information.

Before your visit to Centerville we had tentatively arranged to have mining consultants examine the Centerville coal veins and give us a report on the possible investment and operating cost which would include the washing process. They were also to express their opinion on feasibility of mining this coal for the potential market.

I believe we could accomplish more in discussing this field with a representative of the Freeman Company after this report is available. The consultant will have their representative make his investigation the week of September 19 and we expect the report in our hands about October 1.

I will advise you when the report is available and we can then try to arrange a date for the representative of the Freeman Company to visit with us.

Sincerely yours,

/s/ H. L. Mann
President

HLM:MH

DEFENDANT'S EXHIBIT 17

CC: MR. R. J. HEPBURN
MR. T. J. TARZY

November 15, 1961

Mr. H. L. Mann, President
Iowa Southern Utilities Company
Centerville, Iowa

Dear Mr. Mann:

As you know, since our meeting here in our office several months ago, the Freeman Coal Mining Corporation and our company have continued to investigate the possibility of a mine in Iowa.

Trying to put together enough acreage of strippable coal that could be mined economically seemed extremely difficult. Then we began to consider the possibility of a combination of strip and underground production.

At a meeting of the two companies today, it was decided to pursue this idea and I thought you would be interested in knowing that we are still hopeful that something can be accomplished.

We will assign people from both companies to do some more drilling and investigating and I hope that some time before too long, I can pay you a visit. In the meantime I wanted you to know we are still working on this matter.

With kindest regards,

Sincerely,

JHM:EW

18

June 12, 1962

Mr. J. N. Morris

Re: Preliminary Report
Sunshine Coal Property
Centerville, Iowa

While we still have to have another visit with Freeman for a final report on the underground and/or punch mining and stripping at Centerville, I thought I would give you a preliminary report.

Sunshine seems interested mostly when we talk about their property for power coal and also coal on their railroad. Keeping this in mind, there could be in this area nine to ten million tons of deep coal, of which approximately eight million would be deep mine and one million strippable. Part of this strip does not lie too far from the previous strip area that we looked at which contains 2 1/2 million tons of coal.

This report is based on information we have obtained from Sunshine and their merger drilling records.

All of these tons would have to be proven by new drilling. Our idea would be to do some drilling to first prove the tons and then further drilling to be able to properly mine it.

In the statement below where we say three million tons of finished coal could be put together in one location, this three million tons includes about one half million on which

we would have a two mile deadhead and the other 2 1/2 million is the drilled area we located previously. The 4,100,000-ton reserve mentioned in the last paragraph is without the stripping of approximately one million tons that are on the Sunshine property. These figures can all be cleaned up when we have a combined report.

SUNSHINE COAL COMPANY PROPERTY
NEAR CENTERVILLE, IOWA

During our recent visit to Centerville we concentrated on the properties controlled (deep reserve leases) by the Sunshine Coal Company. Sunshine controls some 2,830 acres and can obtain an additional 760 acres. Their drilling in the area went from 10 feet of cover to 154 feet; however, the locations of these drillings were not definite enough for strip purposes. The main impression obtained from drilling was the fact that this coal dips from the outcrop in something like 4% - that is, 40 feet down per 1,000 foot horizontal distance. Assuming that the hills rise at 3% grade, the overburden depth will increase 40 feet some 550 feet from the edge of the hills, meaning that with little or no bottom land our contour stripping will progress some 500 to 600 feet into the hillside. At this point stripping with a shovel approaches the economical limit and punch mining will begin.

The Sunshine property supposedly has outcrops on the south side about 1-1/3 miles long and on the north 1 mile long - this being adjacent to some 4-1/2 miles of outcrop located by United's previous drilling in the area. The south outcrop is some 2 to 2-1/2 miles from the main or north outcrop. With additional drilling and using what areas were previously considered with the Sunshine property, about 3,000,000 tons of finished coal could be put together in one location. To prove this immediate area for stripping would require 100 to 150 drill holes at a cost of about $7,500 to $10,000. Any additional areas of drilling would be an added cost.

We have considered three different types of stripping equipment: a 6-yard dragline, a 18-yard dragline, and a 35-yard shovel. The following is a breakdown of the production that could be expected from these machines at 40 feet of cover.

	6-Yard Dragline	12-Yard Dragline	35-Yard Shovel
Monthly Production - Yards	100,000	250,000	760,000
Ratio	18.5	18.5	18.5
Monthly Production - Tons	5,400	13,500	41,200**
Yearly Production - Tons	61,000	159,000	465,000
Daily Production - Tons (200 days/year)	305	765	2,320
Estimated Cost per Ton	$4.06*	$4.06	$3.25

* This cost could be 25¢ to 50¢ low due to the low production.

** This tonnage could be reduced to 29,000 tons on a 5-day week, or 330,000 tons yearly, if so required.

Another possibility for this field would be to open the outcrop strictly for punch mining with a 6-yard dragline. This cost would be approximately $2.80 a ton. This would necessitate a small machine to enable a productive punch mining operation to fulfill the demand requirements. United would produce in this (Sunshine) area approximately a total of 100,000 tons, and due to low cover at outcrop the machine is capable of doing this work in ten months on a 24-hour, 7-day week.

At this point I think it should be pointed out that of the Sunshine property (2,830+760) 3,590 acres controlled for deep mining, we will by strip and punch mining recover only approximately 1/2 of the total coal reserves.

Relative to the punch mining by Freeman Coal, it is being considered presently on a 1/2 mile penetration with a recovery or yield similar to the stripping operation which, adhering to the Sunshine property, would have a reserve of 2,800,000 tons, and if the adjacent area was included, an additional 1,300,000 tons could be mined for a total of 4,100,000 tons reserve. Mr. C. Sanford (Freeman) stated that one unit would produce about 250 tons per shift, or 500 tons on a 2-shift operation, or 100,000 tons yearly.

R. J. Hepburn

RJH:IJ

cc: Mr. R. H. Inman

DEFENDANT'S EXHIBIT 19

IOWA SOUTHERN UTILITIES COMPANY

300 SHERIDAN AVENUE, CENTERVILLE, IOWA

OFFICE OF THE CHAIRMAN

November 30, 1962

Mr. Robert J. Hepburn, Vice President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Dear Mr. Hepburn:

We have been studying our coal situation. There has been delay because there are a number of developments that had to be looked into. Our study indicates we have very little concern about an adequate coal supply for at least five years. Some of our people think ten years' supply for present operations will be available. The other companies in our area think a good supply of interruptible gas will be available for a long time in the future. Delay in getting agreement on Iowa Power Pool ultimate plan makes the future market for coal uncertain.

With the reasonably assured supply, our study indicates we would raise our fuel cost over an extended period before we would need a ten-year reserve contract.

Our present cost average is $4.31 f.o.b. Bridgeport with $1.14 freight rate. We have an average Btu value on our purchases of raw coal of 9,700. This makes our f.o.b. Bridgeport cost 22.2¢ per million Btu.

A $4.70 f.o.b. Bridgeport price would raise our cost per million Btu to 24.2¢ and increase our annual cost for 150,000 tons by $58,500.

A $5.00 per ton f.o.b. Bridgeport price would increase our cost, based on 9,700 Btu raw coal, to 25.8¢ per million and our annual cost on 150,000 tons would go up $104,000 annually.

In view of the study results indicating no immediate shortage of supply, we can't justify costs above our 22.2¢ per million f.o.b. Bridgeport at this time.

The recent developments and uncertain future market would indicate that we should not, at this time, expect your company to develop the Appanoose County coal field at the prices we feel we can afford.

We will be glad to discuss this whole matter with you if you care to pursue it further.

Mr. Mann has not been able to hire the kind of person he wants to help him so the lease project has not progressed.

Sincerely yours,

HLM:MH

H. L. Mann
Chairman

DEFENDANT'S EXHIBIT 20

December 10, 1962

Mr. H. L. Mann, Chairman
Iowa Southern Utilities Company
300 Sheridan Avenue
Centerville, Iowa

Dear Mr. Mann:

I wish to acknowledge your letter of November 30. I would have answered you a little sooner but I have been out of the office.

I was deeply concerned about the thought of a good supply of interruptible gas becoming available in your area. While we had talked about this in the past, you did not show much thought that this would be available in quantities sufficient for your power supply. Of course, we do not feel that we could mine coal in this area and compete with gas costs.

It possibly is true that you will have a coal supply for five to ten years. No doubt it will be a little hard at this time to estimate the exact price per ton, or cost per million B.T.U.'s. However, we are interested in this area and feel that we should again pick up more options and do some drilling so that we can determine a cost figure. If under these conditions you feel that you could favor us with coal business if we can be on a competitive basis with other coal prices, we still would like to go ahead with our drilling program and our optioning program with Mr. Ham. If you could indicate that we could be favored with business if we are competitive on this basis, we would like to complete our investigation.

If necessary, we will be glad to come out and visit with you, but perhaps this letter will get us closer together again.

Very truly yours,

Vice President

RJH:IJ
cc: Mr. J. H. Morris
Mr. R. H. Inman

DEFENDANT'S EXHIBIT 21

March 8, 1963

Mr. J. H. Aiken
113 Joplin St.
Benton, Illinois

Dear Jim:

I wish to acknowledge and thank you for your letter of March 5.

I am very sorry this area in Jackson County turned out the way it did. We have, however, worked very closely with Mr. Nugent and have discussed the strip and also the deep coal possibilities. I am, therefore, returning the maps you sent us, which you asked that we send back to you.

I hope that some day in the near future I can stop in and have a little visit with you.

Best of luck to you and your family.

Very truly yours,

/s/ R. J. Hepburn
R. J. HEPBURN

RJH:IJ
Encs. 3

cc: Mr. J. M. Morris
Mr. R. H. Inman
Mr. T. H. Latimer

DEFENDANT'S EXHIBIT 22

May 19, 1964

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
A Division of General Dynamics Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Frank:

Enclosed is draft of letter to Arch Kraakevik of Illinois Power concerning our present contract on Mary Moore coal for delivery to their Danville station.

Before I send this out, will you please look it over and let me know if it has your approval.

Yours very truly,

THE UNITED ELECTRIC COAL COMPANIES
307 North Michigan Avenue
Chicago, Illinois 60601

DRAFT

Mr. A. Kraakevik, Vice President
Illinois Power Company
500 South 27th Street
Decatur, Illinois

Dear Arch:

This will confirm conversation with you in your office on Friday, May 15, concerning coal contract under which we are now shipping from our Mary Moore Mine to your Vermilion Station near Danville, Illinois.

The present contract became effective July 16, 1962, with an expiration date of July 15, 1966. This provided for delivery of 960,000 tons, plus or minus 10%. It was

expected that the land acquired by us would yield about this much tonnage and would be mined out about the approximate date of the contract indicated above. We now know that due to certain unforeseen conditions, at our current rate of production, all of the coal in the present working area will be exhausted by the end of December of this year. As of that date, the contract will still have about eighteen months to go and we will be short approximately 250,000 tons under the amount anticipated in the original agreement.

To fill out this tonnage and time under the present agreement, we propose to supply coal from the Freeman Coal Mining Corporation's Orient No. 5 Mine. This will be raw mine run crushed to a 3" top size through a Bradford breaker, and will analyze approximately 11,100 BTU as received and 15% ash on a dry basis.

The present delivered cost per million BTU's on the Mary Moore coal prior to the effect of the changed labor scale on April 2, 1964 was 21.51¢. The Freeman coal would be delivered to you on this basis, plus the amount per ton finally agreed upon under the escalation clause covering the change in the UMWA contract.

This will protect you, both as to tonnage and price, for the balance of the contract period, and during that time we will continue to inform you of any coal lands that we may acquire in the Danville area which would provide any additional tonnage in that field. We understand, however, that we are to make no land acquisitions without consultation with you as to any future mining for delivery of coal to you.

I understand the above has your approval and we have asked Freeman to confirm the arrangement by letter to you.

Yours very truly,

DEFENDANT'S EXHIBIT 23

MEMORANDUM
from
IRVING CROWN

DATE 4/14

Frank

I note all comments are bullish on future.

No limit that we are reaching end of basic oil reserve replacements.

Thx

Al

MEMORANDUM

From the desk of
J. M. Morris

June 11, 1964

Frank:

Enclosed is a very rough draft of the highlights of last year, which might serve as a guide for what we will say in our Annual Report.

Copy of the Mined-Land Conservation Conference brochure is also enclosed for your information. You will note we are given considerable recognition in the last three or four pages.

After you have looked this over, we can talk about it.

JMM

DRAFT

REVIEW OF THE YEAR

Sales of the Company were the highest on record - $_____ - an increase of 10% (?) over last year. Net income was $_____, an increase over our previous year of 12% (?).

At the end of our fiscal year 1963, bank loans amounted to $1,708,199 and all of this was retired during the year ended July 31, 1964.

The dividend rate of $1.80 per share annually was continued throughout the past year.

Capital Additions

A new heat dryer was installed at the Fidelity Mine and started operating in January of 1964. This dryer removes the excess moisture from the washed coal, increasing the BTU value and avoiding the extreme difficulties of frozen coal in severe winter weather. Prior to the installation of this dryer, our shipments were seriously curtailed during extremely low temperatures and this will now be avoided. The dryer has performed in a very satisfactory manner and completely in accord with our expectations.

We purchased during the past fiscal year two 100-ton haulage trucks to replace worn-out units and this program will be continued as replacement is necessary. The largest trucks we had in use prior to this time were of 50-ton capacity, with some smaller units. We expect greater production and some reduction in our haulage costs as these larger units are put in service.

Sometime during the next eighteen months, it will be necessary to move some heavy equipment to a new location at the Cuba Mine, which will involve considerable expense. Also the acreage we are now working at the Mary Moore Mine will be exhausted. This will involve expense in moving the equipment. Mary Moore has been a small producing property and this will not reflect any substantial reduction in earnings.

No other large capital expenditures, except for normal replacement of equipment and for additional coal deposits, are contemplated during the next fiscal year.

Production and Consumption

Tables, with reference to increase in utility consumption, which can be accounted for by one of our larger utility customers.

Coal Deposits

Organization Changes

None ????

General Dynamics Corporation now owns _____ shares, or __% of the outstanding common stock of the Company.

Change in Fiscal Year

For some time it has appeared desirable to change our fiscal year end from July 31 to December 31. This will make it easier to compare results of the Company with those of other coal producers and industries. Approval of the change was authorized by the Board of Directors during the fiscal year. The interim statement for the five-months period ending December 31, 1964 will be sent to our shareholders and also incorporated in our Annual Report for the calendar year 1965, which also will be our fiscal year.

DRAFT

PRESIDENT'S LETTER TO SHAREHOLDERS

As you will see from the following pages, 1964 was a very good year for your Company. Unusually favorable weather and good operating conditions at all of our mining properties contributed substantially to the results. Increased sales to our customers, particularly one of our larger utility users, made it possible to produce a record 5, , tons. More complete details of the year's accomplishments are described under "Review of the Year".

We continue wherever possible to reclaim land which has been mined and put it to the use for which it is best adapted. Pictures in this report show some of the recreational facilities that have been established and are being used. Most of the responsible strip coal mine operators are doing this. The enclosed brochure produced by the Mined-Land Conservation Conference shows the variety and extent of activities in this direction in many States. Our Company is a member of the Conference and contributes both time and money as well as the talents of our organization to its work.

All of our properties are currently producing close to capacity and we continue to view with optimism the future of the coal industry.

We have always had the sincere and full cooperation of our entire organization and we are grateful to our shareholders, members of the Board of Directors and all employees for their interest and efforts on behalf of the Company.

DEFENDANT'S EXHIBIT 24

June 29, 1965

MR. T. J. TARZY
MR. J. T. MURRAY
MR. R. H. INMAN

In reviewing our property in the Industry field, we apparently have about $845,000 already paid, with remaining liability on purchase contracts of $56,500. All of this land is owned in fee and the average cost per acre is approximately $170. Assuming the tonnage is there according to our drilling, this represents $0.061 per ton.

Our farming apparently is not very productive. Taxes are charged against the farming and last year we lost on farming about $1,000 more than the taxes on the land.

The value of this coal field is certainly more doubtful than it was when we acquired it, with the changes that have developed in transportation, particularly unit trains.

Possibly we should all give this some thought and sometime soon get together and see if anything should be done about it.

J. M. MORRIS

EW

THE UNITED ELECTRIC COAL COMPANIES
307 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60601

BRANCH OFFICES
ST. LOUIS, MISSOURI
EVANSVILLE, INDIANA
PEORIA, ILLINOIS
COMMERCIAL NATIONAL BANK BLDG.

J. H. MORRIS
PRESIDENT

25

HARRIS TRUST & SAVINGS BANK
FIDELITY BLDG.
QUINCY, ILLINOIS
HARRY MORRIS BANKER

October 27, 1965

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
A Division of General Dynamics Corporation
300 West Washington Street
Chicago, Illinois 60606

Dear Frank:

No doubt you kept a copy of report prepared by your Mr. J. H. Matheson, Jr. on cost estimates to try out underground mining at Fidelity. Estimates were as follows on total cost in trucks in the Fidelity pit:

300 Tons per Shift	$3.077
400 Tons per Shift	$2.610
500 Tons per Shift	$2.325

The attached sheet shows costs accrued in trucks in the pit for the periods indicated.

Our fiscal year ended July 31, 1964 was the best in the history of the Company and Fidelity Mine was in very good stripping and operating conditions and achieved a cost of $1.54 for that period. For the period beginning August 1, 1964 and ended December 31, 1964, you will notice a sharp increase in our total stripping cost from 67.1¢ to 89.0¢, and for the nine months ended September 30, 1965, we again went up sharply due to opening the new Green pit, increase in drilling and blasting, and the necessity for operating two machines while we were developing this new pit.

I think a fair estimate of total cost in trucks is probably around $1.80 and this compares with the underground estimate, if we assume a middle-of-the-road basis of 400 tons per shift, of $2.61 in truck. It would appear that a difference of 80¢ per ton is too much to justify trying this method.

We can discuss this further sometime at your convenience.

Yours very truly,

JHM:ES

Fidelity Mine
Analysis of Costs
to put coal in Trucks

	Fiscal Year Ended 7/31/54	5 Months Ended 12/31/54	9 Months Ended 9/30/55
Stripping Costs			
Drainage	.073	.223	.069
Drilling Overburden - Operation	.090	.115	.139
- Maintenance	.046	.045	.052
Blasting Overburden	.122	.121	.258
Stripping Coal - Operation	.120	.129	.196
- Maintenance	.079	.094	.101
Other Stripping Costs	.081	.103	.227
Total Stripping Costs	.611	.830	1.181
Other Costs			
Blasting Coal	.012	.010	.012
Drilling & Blasting Coal	.037	.043	.042
Loading Coal - Operation	.091	.041	.095
Maintenance	.026	.017	.022
Total Direct Costs	.787	1.001	1.229
Welfare Fund	.400	.400	.400
Overhead (2/3 of Total)	.157	.159	.177
Depreciation (2/3 of Total)	.300	.255	.270
Total Costs on Trucks	1.644	1.815	2.076

October 20, 1955

Central Illinois Light Company

GENERAL OFFICES PEORIA, ILL. 61602

January 5, 1966

Mr. J. M. Morris, President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago, Illinois 60601

Dear Mr. Morris:

We are returning your letter of December 16, 1965 unsigned. We feel that an extension of our current Contract through December 31, 1975 would be meaningless in view of the limited Fulton County reserves that are controlled by your Company.

Very truly yours,

Q. W. Wellington
Vice President, Operations

QWW:afb

DEFENDANT'S EXHIBIT 27

March 8th
1966

Mr. J. M. Morris

Some time ago you requested a small scale map of Illinois showing our Fulton County area reserves. Burl has located these proportions on the attached Illinois map which we cut down to letter size for convenience. If, however you desire to show more of the state or possibly the entire state map we have another of these printed maps available.

Also if you want to include our Industry property, this can be shown on this cutout.

I have also attached a table which shows our present reserves as of January 1, 1966 and what potential tons we might possibly get from adjacent tracts.

DALE H. EMLING

DHE/ah
cc: Mr. R. H. Inman
Mr. B. C. Jensen

FULTON COUNTY RESERVES

Mine or Field	Controlled 1-1-66	Potential	Total
North Buckheart	10,247,000	275,000	10,522,000
Cuba	5,316,000	2,100,000	7,416,000
Banner	8,760,000	420,000	9,180,000
South Buckheart	11,163,000	1,480,000	12,593,000
North Canton	11,356,000	530,000	11,886,000
TOTAL	46,842,000	4,755,000	51,597,000

WOODFORD
PEORIA
KNOX
WARREN
MASON
TAZEWELL
FULTON
MACDONOUGH
SCHUYLER
GALESBURG
PEORIA
Peoria
Pekin
Canton
Lewistown
Havana
Macomb
Monmouth
Rushville
Beardstown
Jacksonville
Virginia
Petersburg
Springfield
Chicago

THE UNITED ELECTRIC COAL COMPANIES
307 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60601

BRANCH OFFICES
ST. LOUIS, MISSOURI
ANNAPOLIS, MD.
PEORIA, ILLINOIS
COMMERCIAL NATIONAL BANK BLDG.

J. H. MORRIS
PRESIDENT

28

DIRECTORS
FIDELITY
CUBA
BUCKNEART
MARY MCDOC
BARKER

March 14, 1955

Mr. Frank Bryant
Boca Raton Hotel & Club
Boca Raton, Florida

Dear Frank:

I will see you next week but in the meantime wanted to bring you up to date on the No. 9 seam underground coal near Clay, Kentucky, about which I have given you some information.

Joe Davis, who owns this, is now in a frame of mind to discuss turning it over to some company like Freeman for a future mine on the property. In the meantime two oil companies have entered the scene and are making a determined effort to get control of the reserves. He realizes, however, that this is a long-range proposition and probably will not mean a coal mine in the foreseeable future.

He also is still discussing with both Georgia and Alabama Power a long-term contract but has not as yet been able to get the kind of freight rate on a volume basis that appears necessary.

The TVA has a bid opening on March 29 and he may put in a price on this. He is talking in terms of $3.60 f.o.b. mine for raw No. 9 mine run, on which I am sure he can safely guarantee 11,900. This would be somewhat near recent award made to Bell & Zoller and might result in a contract. If he did get a contract, I think he would still be willing to discuss leasing the coal rights to someone else to operate.

I told him we were somewhat interested but it would take time to investigate and we would not commit ourselves until a thorough investigation and discussion could be had.

I will talk to you more about it when I see you.

Yours very truly,

JHM:RF

DEFENDANT'S EXHIBIT 29

July 13th
1966

Mr. R. H. Inman

Beginning next week we will be drilling in the Medicine Bow Field. Previously, with the preliminary drilling we had on the Greer Boylan property and the Planters State Bank property, Burl had estimated a possibility of around 15,000,000 tons of strippable coal, that is, under a 100' overburden in this area for the one major seam only. With this potential, our plans are to drill the property we have at this time on a 660 grid basis to prove out as much of this estimate as property we control.

Burl tells me at one time he believes that Bill Roope had received verbal approval from someone with Colorado Fuel and Iron for us to drill their property in this area. Some of the Colorado Fuel & Iron lies between our tracts and adjacent to the Planters State Bank property. If we could confirm such an agreement right away it would be possible for us to drill the Colorado Fuel & Iron property on this trip.

/s/ D. H. E.
D. H. EMLING

DHE/ah
cc: Mr. T. H. Latimer
Mr. B. C. Jensen

DEFENDANT'S EXHIBIT 30

July 29, 1966

Mr. T. H. Latimer
Mr. D. H. Emling

We promised Mr. George Heap of Sullivan, Indiana, who brought the area surrounding the Du Quoin reservoir to our attention again, that we would be in touch with him this week or next.

As Mr. Latimer already knows, we have considered the coal acreages up here previously. Mr. Heap pointed out that this could entail twenty-five million tons. However, I beg to differ with him as we have recently reviewed our Du Quoin operation and at this time consider a ratio of 16-17 to one as our stripping limit in this location. The thickness of this coal is at least a foot thinner than we are presently mining at the Du Quoin mine. Therefore, this ratio would be in the area of 65-70 ft. of overburden.

As we promised this man some word this week or the first of next, please review this as soon as possible and advise.

/s/ R. H. Inman
R. H. INMAN

RHI:IJ

DEFENDANT'S EXHIBIT 31

August 9th
1966

Mr. R. H. Inman

STAR LAKE FIELD

McKinley County, New Mexico

In this field there are three state sections which must be ruled on at the August 12, 1966 Board Meeting. As we are interested in prospecting this area further we should keep Permit Nos. M-14728 (641.39 acres) and M-14730 (636.64 acres).

These prospecting permits are for only one year, therefore, we must apply for a state coal lease. The first year coal lease payment would be a minimum annual rental of $25.00 plus an advance royalty payment of $3.00/acre, giving a total cost of $3,884.09 for both sections. The second year advance is at the rate of $4.00 per acre and each year thereafter is at $5.00 per acre rate.

There is a coal washout on permit #14730. Our drill spacing is not close enough to exactly define the washout area, but we feel we can reasonably reduce the lease acreage to 400 acres and still tie up most of the coal on this section. This would reduce the total payment to $3,174.17.

State Permit M-14729 (640 acres) is probably underlain by thick coal, but the overburden is greater than 100'. As the reserves are not strippable this section should be dropped. Total cost on the section would be $1,945.00.

Attached are estimate sheets covering these sections.

/s/ Dale H. Emling
D. H. EMLING
B. C. JENSEN

DHE/ah
BCJ/ah

DEFENDANT'S EXHIBIT 32

THE UNITED ELECTRIC COAL COMPANIES

307 North Michigan Avenue
Chicago, Illinois 60601
September 12, 1966

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
A Division of General Dynamics Corporation
300 West Washington Street
Chicago, Illinois 60606

Dear Frank:

I am sending you herewith copy of inquiry from the Resources Company, which you will find more or less self-explanatory.

It is designed to provide coal from a field controlled by the Resources Company in Utah for a power plant to be built by three utilities, including Southern California Edison. They apparently want somebody to mine the coal for them and the enclosed outlines a proposal they want.

As this is underground coal, I am sending it to you for whatever action you see fit to take.

Yours very truly,

/s/ John
JOHN

JMM:EW

DEFENDANT'S EXHIBIT 33

October 18, 1966

Mr. T. H. Latimer:

In regard to Mr. George E. Heap's proposition on the Sunfield area, which is mainly around the city of Du Quoin's water supply lake, our geologist estimates approximately 12¼ million tons of coal under 80 ft. of overburden. The better stripping is under the lake, and 3⅓ million tons is presently under water.

There are approximately 117 houses surrounding this lake. Seven of these homes are in the $15,000 to $25,000 bracket, either on purchased land or land leased from the city of Du Quoin. One hundred ten houses are worth from $2,000 to $5,000 each.

Mr. Heap's proposal is that he would require a 3¢ per ton royalty on coal up to a depth of 100 ft. Because of the thickness of this coal and the amount of rock in the overburden, we question whether 100 ft. is economically strippable. This coal is approximately 5 ft., which is about one foot less than we presently are mining at the Fidelity mine. Mr. Heap desires 75% advance royalty on the estimated tonnage and a payment of $12,000 initially and $12,000 annually until mining starts.

The first problem to be resolved is, what is the estimated tonnage. Mr. Heap is estimating 25 million, we estimate considerably less. Mr. Heap presently has one option to purchase in this area of 480 acres. Before we pay Mr. Heap 75% advance royalty, United or Mr. Heap should control 75% of the property that is agreed upon as being strippable. An agreement possibly could be made up giving Mr. Heap a certain period of time to acquire in his name the other properties that would eventually be transferred to United. The agreement should also include, after this period of time, United's right of first refusal. We possibly could pay Mr. Heap's expenses and cost during the time he is endeavoring to acquire these properties.

As you know, I am not very optimistic about this field. I do not feel that anyone except United or Truax-Traer will mine the area because of the size.

If Mr. Heap desires to talk on these terms, we will be glad to meet with him and discuss the matter more thoroughly.

We are, of course, very much concerned about the lake and the drainage into this lake. We question whether the city of Du Quoin would allow a coal company to mine this property by strip methods, and with the number of houses on the lake, the cost may be prohibitive.

/s/ R. H. Inman
R. H. INMAN

RHI:IJ
cc: Mr. J. M. Morris
Mr. J. T. Murray

DEFENDANT'S EXHIBIT 34

ILLINOIS STATE GEOLOGICAL SURVEY

Natural Resources Building
Urbana, Illinois 61801

July 31, 1967

Mr. Frank Nugent, President
Freeman Coal Mining Corp.
307 North Michigan Avenue
Chicago, Illinois

Dear Mr. Nugent:

The following is written in response to our recent conversations concerning our series of reports entitled "Strippable Coal Reserves of Illinois" and the general status of strippable coal reserves in the State.

As you have indicated, correctly, the prime objectives of this study have been to develop all available data to suggest little or unknown areas where such reserves might exist and to determine an "estimate of reserves." Several significant points spelled out in the text of this series of reports are reviewed for you here.

1. Minimum coal thickness considered is 18 inches.
2. Maximum overburden thickness considered is 150 feet.
3. 1800 tons per acre foot was used in calculations, in order to be in conformity with U. S. Geological Survey standards. As our coals largely fall in the lower range of the high volatile coals, we have felt that 1770 tons per acre foot might be more representative.
4. No exclusions have been made for surface features that would render mining impractical, such as towns, railroads, highways, etc. These exclusions were not made because it was not practical on the scale of our mapping and with much data not readily at hand to make any such exclusions consistently. No evaluations have been made of mining conditions or coal quality.

5. "Reserve" figures represent total coal remaining in the ground as of the date of each study, and no attempt has been made to estimate "recoverable" reserves.

We cannot assess economic feasibility for strip mining as this is strictly an industry matter that varies from day to day and even may have variable response from different companies at the same time. It should be emphasized, however, that the estimates for total coal in the ground are reported in such a way that current economic conditions in any particular area can be assessed relative to factors reported in these studies. Overburden categories of 50, 100, and 150 feet, and average thickness, generally in one foot increments, permit the reader to put thickness and overburden limits within his own current definition. It is a serious mistake to use merely total values as published without considering the definitions.

As you well know, we have maintained very close working relationships with *all* major coal companies in the State and have rendered assistance in locating possible new reserves for many years. As of about 15 years ago, although the coal industry of the State was much depressed, a high level of activity in locating strippable coal reserves remained and has continued in the years since. A somewhat comparable scramble for new underground reserves has developed in the last several years.

So intense has been the interest in the more favorably situated strippable reserves, that I do not know of any prime acreage that is not now under control. We continue to hope from our studies that additional prime reserves may be discovered in areas not now proved, but know that the more promising areas that were previously little known have been tested.

Concerning your inquiry about Indiana and Kentucky strippable coal, I am not as intimately familiar with these areas as with Illinois, but know that the same general picture holds for these areas (as it does for other coal areas east of the Mississippi River, I am sure).

We certainly agree that no economic factors are evaluated by our studies. Further, although significant reserves are held by several companies, we cannot now specifically designate any area where coal under con-

ditions generally being mined at present are available, other than lands under control. It has been our sincere hope that in the use of our reports that the limitations and objectives would be appreciated by the users.

If I may provide any further information, please do not hesitate to let me know.

Sincerely yours,

/s/ Jack A. Simon
JACK A. SIMON
Principal Geologist
Geological Group

STANDARD COAL CONTRACT

THIS AGREEMENT subject to the terms and conditions printed on the reverse side hereof, 35

30th day of September, 19 68, between THE UNITED ELECTRIC COAL COMPANIES, 307 North Michigan Avenue, Chicago 1, Illinois, hereinafter referred to as Seller, and CENTRAL ILLINOIS LIGHT COMPANY of Peoria, Illinois hereinafter referred to as Buyer, is as follows:

Seller hereby agrees to sell and deliver, and Buyer hereby agrees to purchase and accept, between the 1st day of January, 19 73, and the 31st day of December, 19 91, the quantity and kind of coal and at the price and on the terms and conditions hereinafter stated, to-wit:

QUANTITY One million tons per year (plus or minus 10%).

RATE OF SHIPMENT (approximately) Approximately equal monthly quantities.

DESCRIPTION: Coal under this contract shall be Fulton County, Illinois, No. 5 and No. 6 seam Washed 1-1/4" Screenings (see attached Supplement

produced at the Buckheart Mine of Seller.

PRICE $4.25 per net ton f.o.b. mine, exclusive of any sales, occupational, or use taxes. See attached Supplement which is hereby made a part of this Contract.

TO BE SHIPPED TO Buyer.

DESTINATION Generating Stations as designated by Buyer.

USE: Coal shipped hereunder to be used for boiler fuel by Buyer in its plants at various plants.

ROUTING As specified by Buyer TRANSPORTATION EQUIPMENT As specified.

TERMS OF PAYMENT Net cash on or before 10th day of each month for all coal shipped during preceding calendar month.

(All payments are payable in United States Currency at Buyer's principal office.)

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed in quadruplicate by their respective officers duly authorized the day and year first above written.

CENTRAL ILLINOIS LIGHT COMPANY
BUYER

By C. H. Morris

Title Vice President

THE UNITED ELECTRIC COAL COMPANIES
SELLER

By C. T. Cowin

Title President

DEFENDANT'S EXHIBIT 36

[redacted]

Peoria, Illinois 61630

September 5, 1969

Mr. Reuben L. Hedlund
Kirkland, Ellis, Hodson, Chaffety & Masters
Prudential Plaza
Chicago, Illinois 60601

Dear Mr. Hedlund:

The results of five feasibility studies made on the use of coal versus gas for fuel are as follows:

1. East Peoria Plant -- study made in 1967 by an oil supplier indicated a higher cost for natural gas and/or oil. Decision was to continue using coal for fuel.

2. East Peoria Plant -- study made in 1965 on the use of natural gas for producing steam indicated that the use of natural gas would result in increased fuel costs. Decision was to continue using coal for fuel.

3. Aurora Plant -- study made in 1965 on the use of natural gas for two new buildings resulted in the purchase of two natural gas fired steam boilers to supply heat for process and building heat.

4. Mapleton Plant -- study made in 1965 resulted in the purchase of gas-fired make-up air units. No coal is used at the Mapleton Plant.

5. Mossville Plant -- study made in 1966 resulted in the purchase of a 125,000#/hr. gas-fired boiler to supplement the two 80,000#/hr. coal-fired boilers.

Sincerely,

John Welsh

Supervising Engineer
Mfg. General Office
Plant Engineering

JWelsh
Phone (309) 675-4131
ed

cc: SDabney

DEPARTMENT OF JUSTICE
Room 2634 United States Courthouse
Chicago, Illinois 60604

DEFENDANT'S EXHIBIT 37

60-0-37-920

September 12, 1969

BY MESSENGER

Reuben L. Hedlund, Esq.
Kirkland, Ellis, Hodson,
Chaffetz & Masters
Prudential Plaza
Chicago, Illinois 60601

Dear Mr. Hedlund:

By letter dated September 8, 1969, you requested information concerning the sale by Peabody Coal Company of a new coal company (which Peabody refers to as the "Midland Division") which is required by Paragraph VII of the Final Judgment in United States v. Peabody Coal Company et al., dated October 23, 1967.

Your first request is for a list of the companies approved by the Government as eligible potential purchasers of the Midland Division from those firms which had expressed an interest in the properties to be divested by Peabody. On July 2, 1969, we advised counsel for Peabody Coal Company what our views were at that time with respect to the following prospective purchasers:

Group 1. No objection - subject to receipt of satisfactory financial information:

Alberta Coal Ltd.
New Era Corporation
Sherwood-Templeton Coal Co. Inc.
H. E. Drummond Coal Co. Inc.

Group 2. No objection:

Cerro Corporation
Utah Construction & Mining Co.
The Cleveland-Cliffs Iron Co.
Ziegler Coal & Coke Company

Group 3. Reserved:

Panhandle Eastern Pipe Line Company
Pickands Mather & Co.
Cities Service Oil Company
The LaSalle Corp. (Henry Crown & Co.)
Great Lakes Carbon Corp.
American Smelting and Refining Co.
Ashland Oil & Refining Co.

Group 4. Unacceptable:

Pittsburg & Midway Coal Mining Co.
The North American Coal Corp.

Your second request asks for the total tons of recoverable coal reserves assigned to each of the Midland Division's three mines, whether owned or controlled by location. Peabody Coal Company has represented that the total available coal reserves owned, leased, under option or controlled by location for each mine are as follows:

Elm, approximately 65,000,000 tons.
Mecco, approximately 55,000,000 tons.
Allandale, approximately 8,500,000 tons.

As you are aware, coal reserves "controlled by location" refer to coal reserves in the vicinity of a mine which reserves are owned by third parties and which reserves may be acquired in the future.

Your third request calls for the expected life of the three mines.

Paragraph VII of the Final Judgment requires the sale of a coal company producing and selling 6,000,000 tons of coal each year that shall have or shall reasonably be expected to be able to obtain sufficient coal reserves for continued production and sale of bituminous coal of not less than 6,000,000 tons each year for 20 years. Peabody Coal Company offers to sell the above described mines to comply with the Final Judgment.

Your fourth request asks for the present time schedule for the submission of bids from potential purchasers of Midland and the contemplated date of sale. The Final Judgment requires Peabody Coal Company to sell the coal business to a purchaser approved by the United States or by the sale of stock to the public through an underwriter on or before October 23, 1969. It is our understanding that Peabody Coal Company has invited bids to be submitted on or before September 15, 1969.

I hope that this information will be helpful to you in formulating a settlement proposal.

Sincerely yours,

RICHARD W. McLAREN
Assistant Attorney General

By John T. Cusack
John T. Cusack
Attorney, Midwest Office
Antitrust Division

DX 38 Zeigler Coal & Coke Company and Subsidiaries

1965 Annual Report

* * *

TO OUR SHAREHOLDERS

Results of operations for 1965 are submitted in detail in this report for the year. In the major categories, such as total production, sales and net income, our 1965 figures were approximately the same as for the preceding year. Apart from normal coal operations, the past year will be considered noteworthy for the reason that negotiations were completed for the sale of natural gas from your Company's West Kentucky properties. Also, your Company, during the past year, was the successful bidder for a large coal contract with the Tennessee Valley Authority. Dividends totalling $1 per share were paid during the year.

Concerning 1966, we have every confidence of an improvement in earnings.

Production, Sales, Net Income

Production of coal in 1965 amounted to 4,468,371 tons. Net sales in the year 1965 totalled $17,600,334.

Both production and net sales were slightly improved over that of 1964.

Net income for 1965 after taxes amounted to $1,024,622 as compared with $1,009,603 in 1964. The 1965 net income was equal to $2.14 per share as compared with $2.12 per share in 1964.

Coal Operations

Operations of our mines were at a satisfactory level in 1965 with the exception of our Zeigler No. 3 mine. This latter property continued to present us with serious operating difficulties. Our earnings for the year would have been materially improved if we had been able to operate this mine without a loss. In spite of the difficulties, we are still hopeful that our

problems can be successfully solved so as to make this mine a more satisfactory operating venture. It is not an easy decision to close a mine and leave millions of tons of coal unmined. We will avoid such action if it is at all possible, although it is not our intention to continue to operate the mine if our mining problems cannot be resolved.

TVA Contract

A major event of the year and a significant development in the current history of the Company was the coal contract award received in October from the Tennessee Valley Authority. The award, largest in the history of Zeigler and its subsidiary, Bell & Zoller, involves a total of 26,000,000 tons of coal to be delivered over a 15-year period.

At the time of the announcement of the award, a letter to shareholders notifying them of this development said: "We expect the revenues from the award to contribute satisfactorily to earnings of the Company over the life of the contract."

To fill requirements of the contract necessitates our opening a new mine on our Hopkins County, West Kentucky, properties. The fact that your Company owns substantial reserves of coal in that area was a consideration in the award decision made by the TVA authorities. The operation of the mine will be featured by the use of the most modern high-capacity production machinery and equipment available for the underground mining of this seam.

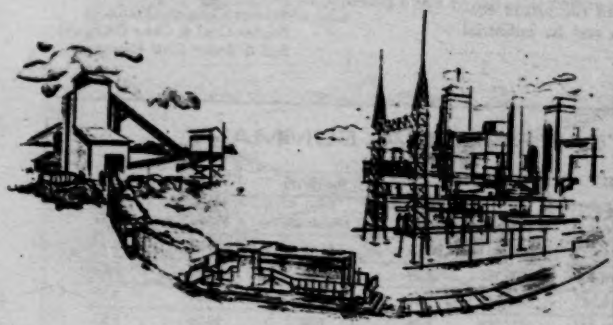
Natural Gas

Delivery of natural gas from your Company's West Kentucky wells to the line of Texas Gas Transmission Company began on December 17, 1965, shortly after temporary permission for such sale was forthcoming from the Federal Power Commission. The actual introduction of this fuel into the distribution channels of Texas Gas grew out of a gas purchase contract entered into with that Company. Stockholders were advised of this event by letter dated November 9.

As pointed out in that letter, the contract with the transmission company provides for the sale to them of a minimum of 4,200,000 cubic feet daily at a price of 17 cents for each 1,000 cubic feet, with the contract extending over a 20-year period. Texas Gas, under an option, can purchase at 15 cents per 1,000 cubic feet all of the gas in place at any time during the first 12 years of the contract.

Land Reclamation

Your Company is engaging in a program to develop several thousand acres of land owned in Franklin and Williamson Counties (Illinois)



for farm land or other productive purposes. Plans for upgrading the land-use followed preliminary studies that revealed a considerable amount of existing non-farm acreage is tillable land while other land in the area may also be converted in this manner to economically useful purposes. Between 6,000 and 7,000 acres of timberland are included in the program. The program as a whole can provide increased agricultural production and afford improved hunting and fishing in cooperation with conservation measures.

Properties and Reserves

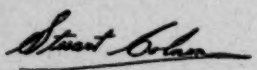
An accompanying reproduction of an area map identifies the location of the Company's principal coal producing properties. Our Southern Illinois mines are located in an area known for many years as the "Quality Circle", and the West Kentucky properties are also favorably identified in the same manner in regard to the quality of coal being marketed from that section. Our association with this kind of identification is insured for a long period of time since your Management has been careful to accumulate new and added reserves of coal as it has drawn upon available resources. Coal as an energy fuel and as a natural resource is receiving revived attention, especially from those who are concerned with the future economic security of the nation and its industrial might.

Organization

In keeping with the Company's retirement policy, Mr. William F. Landes resigned as Executive Vice President of Bell & Zoller Coal Company and Mr. Conrad W. Peterson resigned as Vice President and Treasurer of Zeigler Coal & Coke Company. Mr. Landes continues as a Director of Zeigler Coal & Coke Company. Mr. Warren Wurzburg, Vice President in Charge of Sales of Bell & Zoller Coal Company, was named Vice President of Zeigler Coal & Coke Company and John R. Cosbey was promoted from Assistant Treasurer to Treasurer of Zeigler Coal & Coke Company. Michael K. Reilly was elected Assistant Secretary of Zeigler Coal & Coke Company.

Mr. Landes and Mr. Peterson in their many years with the Zeigler and Bell & Zoller organizations contributed notably to their success. Their advice and counsel, growing out of long years of service in the best interests of our companies, will continue to be available.

Cordially,



STUART COLNON, *President*
Zeigler Coal & Coke Company
Bell & Zoller Coal Company

TEN YEAR FINANCIAL SUMMARY

Year	Net Sales	Net Income	Shares Outstanding	Per Share: Net Income	Per Share: Dividends	Per Share: Book Value	Current Ratio
1965	$17,600,334	$1,024,622	479,687	$2.14	$1.00	$28.89	2.81
1964	17,371,027	1,009,603	476,382	2.12	1.00	27.81	2.61
1963	16,620,632	716,762	476,382	1.50	1.00	26.94	3.95
1962	17,333,439	828,053	471,806	1.76	1.00	26.54	3.97
1961	18,078,645	992,667	462,781	2.15	.85	26.05	3.73
1960	19,155,436	1,062,510(1)	440,256	2.41(1)	.75	25.03	3.56
1959	19,157,595	773,210	423,409	1.83	.60(2)	23.37	3.19
1958	19,595,540	737,805	409,359	1.80	.60(3)	22.81	1.96
1957	21,326,174	372,603	390,363	.95	.80	22.65	2.66
1956	22,530,625	866,975	392,263	2.21	.85	22.41	2.56

(1) Does not include Non-Recurring Capital Gain of $224,276 or $.51 per share.
(2) Additional 3% dividend in stock paid December 10, 1959.
(3) Additional 5% dividend in stock paid December 11, 1958.

* * *

DX 39 Zeigler Coal & Coke Company and Subsidiaries
1966 Annual Report

* * *

Production and Sales

To Our Shareholders:

The year 1966 was an unsatisfactory one for the Company. As disclosed in quarterly shareholder letters, the Company had to contend during much of the period with adverse conditions at certain of its mines, notably Zeigler #3, finally closed in December. Actions taken to deal with production troubles in these areas were bearing fruit in such manner that improvement in our operating experience was being emphatically shown in early 1967. Also, satisfactory progress can be reported in the construction of our new West Kentucky #9 mine, output of which will go to fill our large Tennessee Valley Authority coal contract. Meanwhile, oil and gas continue to contribute substantially to our income.

Production of coal amounted to 4,245,230 tons in the year ended December 31, 1966. In the preceding year production was 4,468,371 tons.

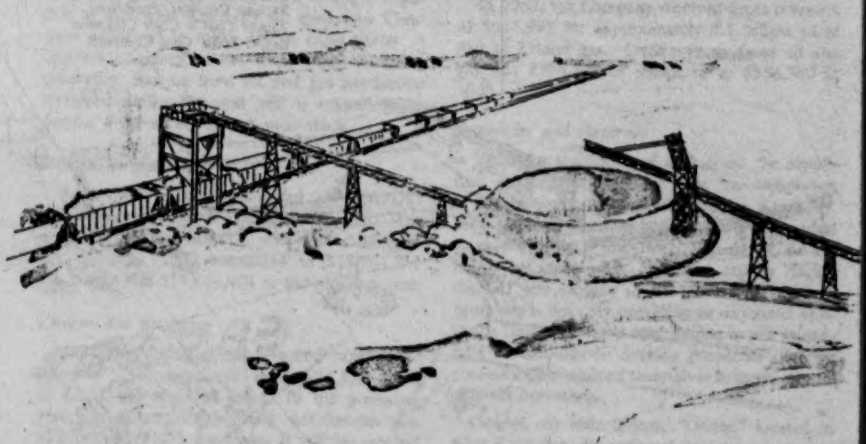
Net sales for 1966 of $17,441,404 compared with $17,600,334 the year before.

Income and Extraordinary Charge

The accompanying Consolidated Statement of Income sets forth in detail the facts about revenues for the year, costs and expenses, federal taxes and takes account of the extraordinary charge made against 1966 earnings incident to the closing of Zeigler #3. It will be seen that income, before federal tax provisions, amounted to $630,224 and that after adjustments of taxes, income was $730,476. Were it not for the extraordinary charge imposed by the closing of Zeigler #3 the statement of the year's earnings would terminate at that point, indicating 1966 earnings equal to approximately $1.53 per share. However, the necessity of applying losses of the Zeigler #3 closing to the fiscal period in which the action took place created the extraordinary charge of $638,093. After that charge, net for the year amounted to $92,383.

TVA Contract

We were able to report, in the annual statement for 1965, that the Company and its subsidiary, Bell & Zoller Coal Company, had been awarded a major coal contract by the Tennessee Valley Authority—a contract involving 26,000,000 tons to be delivered over a 15-year period. Last June, we began construction of the mine in West Kentucky, and slope construction and the building of surface facilities have been progressing satisfactorily. Our production schedule calls for shipments to begin this fall barring unforeseen circumstances. We will, in quarterly reports, keep you apprised of the progress of this mine. The accompanying sketch provides shareholders with an artist's conception of the surface appearance of the mine.



Artist's concept of surface facilities of Zeigler #9 mine.

Natural Gas

The Company has been supplying natural gas from its West Kentucky wells to the line of Texas Gas Transmission Company for a little more than one year. For the year 1966, approximately 2.1 billion cubic feet of gas was supplied at a price of $.17 per one thousand cubic feet which provided revenue amounting to $356,783. Total revenue from oil and gas amounted to $556,340 as compared to $139,726 in 1965.

Capital Expenditures

Expenditures for capital improvements and expansion will be at a high level for the Company in 1967. Under a term loan agreement, negotiated in connection with the Zeigler #9 mine now under construction, the Company may borrow from two banks a total of $3,500,000 to July 5, 1967. As of December 31, 1966, the sum of $300,000 had been borrowed against this commitment, which will continue to be drawn upon as construction proceeds to completion. The bank loan is for a term of five years, at a rate considered satisfactory to the Company. Its provisions are those common to such undertakings. The expenditure for capital purposes in 1966 totalled $1,460,526 and it is anticipated that about the same amount will be required in 1967 over and above the cost of construction of #9.

Outlook

As 1965 ended, I reported to you my hope for an improvement in all of our production operations, especially at our Zeigler #3 mine. Unfortunately, this latter was not to be and so, as I reported earlier, the drastic step of closing the mine was taken.

Our new Zeigler #9 mine supplying the Tennessee Valley Authority contract will contribute little to income in the year 1967. We will be in development work for substantially the entire year. I would like to repeat what was stated when the award was made: we believe it will be a most profitable contract.

The problems we experienced at our other mines, about which I have written during the past year, have largely been resolved. These mines are operating successfully and profitably, and our preliminary figures for January and February are an indication of that fact.

The Company is realizing a large income from gas and oil properties it owns. We have no reason to believe that they will not remain a continuing source of revenue. Drillings are proceeding, and if successes occur in this area, shareholders will be kept advised.

Summary

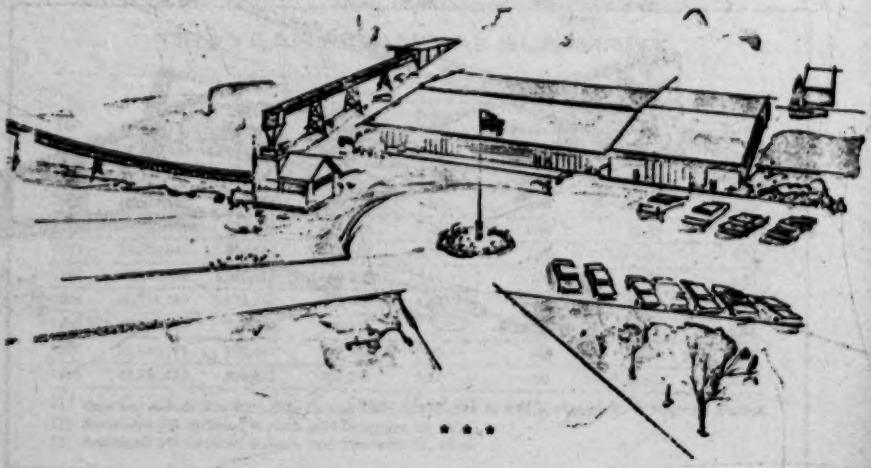
It can be said with a high degree of confidence that the outlook for 1967 is for substantial improvement over 1966. It is not my intention to try to predict the extent of this improvement. Progress here will be covered in the interim reports to you during the course of the year.

Cordially yours,

Stuart Colhon

STUART COLHON, *President*
Zeigler Coal & Coke Company
Bell & Zoller Coal Company

March 27, 1967



• • •

DX 40 Zeigler Coal & Coke Company and Subsidiaries
1967 Annual Report

* * *

TO OUR SHAREHOLDERS

The year 1967 proved to be one of the most profitable years in the history of our Company. In quarterly reports to you during the past year, you were kept informed of our progress. As expected, sales and production were less than in 1966; but, as anticipated, our operating results were very gratifying. In addition to the completion of our West Kentucky #9 mine, our Company continued to make capital expenditures to improve efficiency of the three other operating properties. Income from oil and gas production increased during the year and is exceeding the present dividend on the common stock.

Production and Sales

Production of coal amounted to 4,063,087 tons in the year ended December 31, 1967. The previous year's production was 4,245,230 tons. Net sales for 1967 amounted to $15,861,781 compared with $17,441,404 in the previous year.

Income and Expenses

Net income after all charges and expenses in the year 1967 amounted to $1,341,839 equal to $2.81 per share of stock. In the preceding year, on a comparable basis, net income was $730,476 or $1.53 per share. It will be recalled that in 1966 we had to apply, against that year's earnings, an extraordinary charge of $638,093—the equivalent of $1.34 per share — incident to the closing of the Zeigler #3 mine, and so our actual net income per share for 1966 was 19 cents.

Natural Gas and Oil Income

In 1967, the Company received gross revenues of $357,977 for approximately 2.1 billion cubic feet of natural gas. Total revenue from oil and gas was $596,366 as compared to $556,340 in 1966.

Properties and Reserves

From the standpoint of operations, the significant development in 1967 was the completion of our new mine (#9) at Madisonville, Kentucky. Production at this mine began, on a most modest scale, shortly after mid-1967. The output, we are happy to report, has expanded rapidly during the last few months of the year. This modern operation is not only providing an economic asset to the Company but is contributing to our knowledge of methods to develop properties that we possess which can lend themselves to large-volume contract operations.

One of our older mines, "Oriole," located in West Kentucky, discontinued operations very late in 1967. This action was necessary for the vein

of coal that supported this operation had been worked out and the small amount of coal that remained could not be mined profitably. The closing of this mine did not incur any extraordinary charge for the Company, as in the case of our #3 mine in 1966, because the slope at Oriole offers the possible opportunity of re-opening this property and of mining the #9 seam of coal that lies beneath it. This possibility is being thoroughly investigated and assessed.

Among the improvements in the upgrading of our other properties is the new slope at our Murdock mine, now under construction. When this work is completed, the mine can be more profitably operated to meet the demand of a new long-term contract that was recently awarded us.

We have not, heretofore, reported on the reserves of coal that your Company either owns or leases. Conservatively, our reserves at the 1967 year-end were in excess of 500,000,000 tons of recoverable coal. We are continuing a ceaseless quest to gather coal reserves, and we consider it a major undertaking of the Company. During the last ten years we have mined approximately 42,000,000 tons while in the same period of time we have added over 150,000,000 tons to our reserves. We feel that the coal acreage that has been added during this period has strengthened our position in the industry and enhanced our future production potential for long-term contracts.

The work of reclaiming surface land owned by your Company continues. At present, approximately 4,400 acres are involved in this effort, and it is being directed by a competent agricultural and farming staff. In 1968, additional acreage will become available for cultivation. This is a continuing, long-term project for the Company and one that is certain to add to the over-all profits and value of the Company in future years.

Capital Expenditures

Our capital expenditures during 1967 were larger than the average of past years due primarily to the construction costs of the new #9 mine. Including that undertaking, and the amount spent at other properties to maintain them in efficient condition, the total for the year was $4,750,198. The accompanying financial statements set forth the borrowing that was necessary in order to carry out these programs, notably the investment that had to be made for an entirely new property, namely, our #9 West Kentucky mine. The amount required for future capital outlays will be more in keeping with normal demands of our properties.

Organization

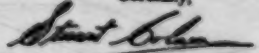
Certain changes in the organization structure of Zeigler Coal & Coke Company took place during the past year. The undersigned was named Chairman of the Board of Zeigler Coal & Coke Company. Mr. Michael E. Walsh, Vice President, was named President of the Company. Mr. John R. Cosbey was named a Vice President.

Bell & Zoller Coal Company, our operating company, had the following changes in its organization: Mr. Warren F. Wurzburg, a Vice President previously in charge of Sales, was placed in charge of Administration of that Company; Mr. Scott M. Rogers, a Vice President, was put in charge of Sales; Mr. Arthur Towles, previously General Mine Superintendent, was named Vice President of Operations. Mr. John R. Cosbey and Mr. Michael K. Reilly were named Vice Presidents.

Without the excellent work of my associates, the gratifying results of 1967 could not have been achieved. I am most grateful to them for giving me the privilege of presenting this fine report for the year 1967.

We look forward to 1968 as being a very good year.

Cordially,



STUART COLNON
Chairman

March 22, 1968

* * *

DX 41 Zeigler Coal & Coke Company and Subsidiaries
1968 Annual Report

* * *

	1968	1967
Net sales	$15,312,751	$15,001,781
Net income	112,471	1,341,839
Net income per share	.24	2.81
Cash dividends paid per share	1.00	1.00
Net assets applicable to stockholders' equity	13,966,614	14,378,234
Book value per share	29.38	30.15
Shares of common stock outstanding	475,408	476,899

Year	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959
Net sales	$15,312,751	$15,001,781	$13,643,454	$13,888,324	$13,571,327	$14,020,622	$17,222,439	$18,570,845	$19,759,426	$19,157,205
Net income	112,471	1,341,839	(738,676)(1)	1,274,422	1,888,883	1 744,782	(826,863	(992,887	$1,662,344)(2)	(772,210
Shares outstanding	475,408	476,899	477,867	479,867	479,362	479,362	477,899	485,781	648,256	423,408
Net income (per share)	.24	$2.81	$1.55(1)	$2.14	$2.12	$1.55	$1.78	$2.15	$2.41(2)	$1.83
Dividends paid (per share)	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	.80	.70	.60(3)
Book value (per share)	$29.38	$30.15	$29.84	$28.00	$27.51	$26.34	$26.34	$26.85	$25.83	$22.37
Current ratio	2.15	2.07	2.48	2.85	2.87	2.95	2.87	2.72	2.54	2.19

1) Does not include nonrecurring charge of $838,000 or $1.76 per share.
2) Does not include non-recurring gain of $254,778 or $.53 per share.
3) Additional 3% dividend in stock paid in 1959.

ZEIGLER

Coal & Coke Company

To our shareholders:

High maintenance and operating costs at our Zeigler #9 mine, coupled with difficult mining conditions at Zeigler #4, none of which could have been anticipated, made 1968 a disappointing and trying year. In addition to these operating difficulties, all of our mines were victims of unauthorized work stoppages last Fall while a new union contract was being negotiated. It was truly a year of pyramiding difficulties, and it is to the credit of our management and supervisory team that the final results for the year were not more disappointing.

Operating conditions and production improved considerably during the closing weeks of the year, however, and better results were experienced after the turn into the new year. Therefore, I look forward to a satisfactory showing for the first quarter of 1969 and the balance of the year with our major difficulties, incurred last year, behind us.

This Annual Report brings to you the detailed information about all phases of the financial record of 1968 compared with 1967, and earlier years as well. We would recommend a careful examination of the material on the following pages and will welcome any inquiries Shareholders may wish to make.

Production and Sales

Production of coal amounted to 4,038,356 tons in the twelve months ended December 31, 1968, compared to 4,063,087 in 1967. Net sales for 1968 amounted to $15,312,751 compared with $15,861,781 in the preceding year.

Income and Expenses

Net income, after all charges and expenses in the year ended December 31, 1968, amounted to $112,471 equal to 24 cents per share of common stock of which there were 475,408 shares outstanding at the year end. In 1967 the Company enjoyed one of the best years in its history, earning $1,341,839 or $2.81 per share. Produc-

tion and operating difficulties, earlier described, were so severe that their effect on 1968 profit results for the year were inevitable. We dealt earnestly and as successfully as possible with the problems the year developed, and we can only say that the whole organization is determined to make 1969 a banner year.

Gas and Oil Income

In 1968, income from oil and gas sources amounted to $462,372 as compared with $596,366 in the previous year. In 1968, sales of natural gas amounted to 1.6 billion cubic feet as compared with 2.1 billion in the preceding year. The decline in sales of natural gas and oil may be expected to continue and thus reduce the amount of income from this source. However, plans are under way actively to resume exploratory operations to obtain new sources of revenue from oil and gas on Company-owned property.

Properties and Reserves

Company-owned reserves of coal were increased during 1968, and we estimate that at the present time the Company has reserves in the neighborhood of 550,000,000 recoverable tons, up from 500,000,000 tons in 1967. The size of these reserves testifies to the strong underlying position of your Company, making it possible for it to negotiate long-term contracts with major consumers, potentially the greatest growth opportunity for the Company.

In the 1967 Annual Report we referred to improvements under way at our Murdock (Ill.) mine. The new slope and new raw coal handling facilities there have been completed, and an accompanying sketch shows the modern resulting operation as it is at present.

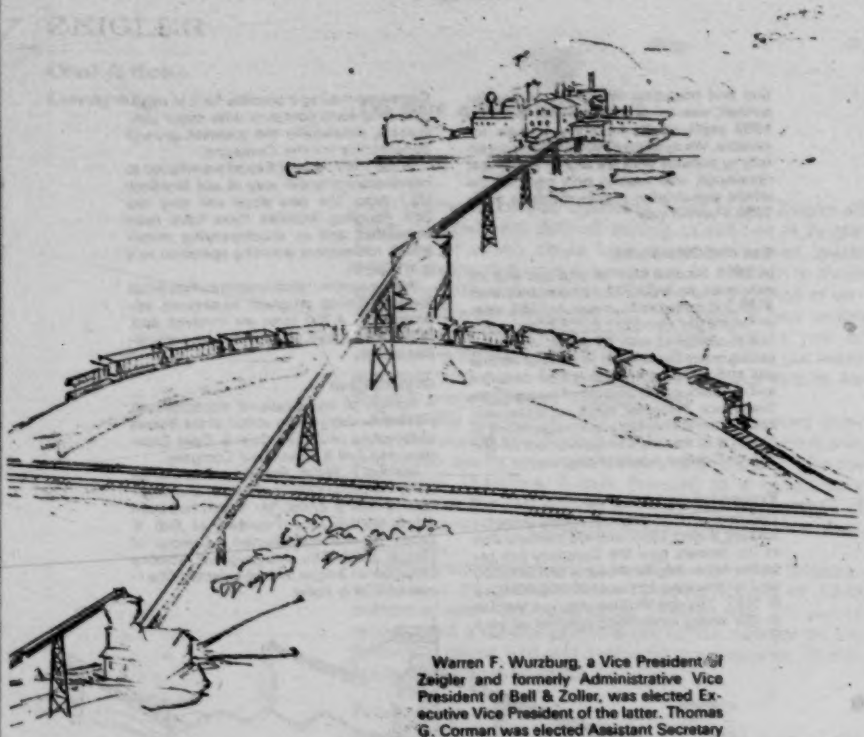
We are continuing to reclaim surface lands for our farming program. At present, approximately 4,700 acres are involved, and, to this total, more acreage will be continually added.

Organization

A number of organizational elections took place early this year by action of the Boards of Directors of Zeigler Coal & Coke Company and Bell & Zoller Coal Company.

Michael E. Walsh, President, was elected Chief Executive Officer of Zeigler and President of Bell & Zoller. Mr. Walsh had been Administrative Vice President of Bell & Zoller. He was also elected a Director of Zeigler Coal. The undersigned remains Chairman of Zeigler and was elected Chairman of Bell & Zoller.

This is an artist's rendering of the new slope and surface raw coal-handling facility of the Murdock (Ill.) mine.



Mr. Walsh has been closely associated with the managements of the companies for many years. He held the posts of Vice President, Secretary and Assistant to the President in years prior to his election, in 1967, as President.

George P. Latchford, III, a partner of the law firm of Latchford, Bianucci, Rice & O'Brien, who has been associated with corporate affairs of our companies, was elected Secretary of Zeigler. He was also elected Secretary of Bell & Zoller. Michael K. Reilly, formerly Assistant Secretary and Assistant Treasurer, was named Assistant to the President of Zeigler. He is also Administrative Vice President of Bell & Zoller.

Warren F. Wurzburg, a Vice President of Zeigler and formerly Administrative Vice President of Bell & Zoller, was elected Executive Vice President of the latter. Thomas G. Corman was elected Assistant Secretary and Assistant Treasurer of the Company.

The Company is indebted to its fine Board of Directors for their loyal and conscientious efforts during a trying year for the Company, and our excellent team of officers and supervisory groups performed nobly, as did all of our employees. It is a pleasure to express the appreciation of the companies to each and every one of them.

Cordially,

Stuart Colnon
Chairman

April 23, 1969

• • •

DEFENDANT'S EXHIBIT 42

REPORT

TO THE SHAREHOLDERS

THREE MONTHS ENDED
MARCH 31, 1969

ZEIGLER
Coal & Coke Company
200 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

To Our Shareholders:

Accompanying this report of operations for the quarter ended March 31, 1969, is a dividend check to your order in the amount of 25 cents per share.

Sales for the first quarter of 1969 amounted to $4,728,335 as compared with $4,414,979 for the same period of 1968. Costs and expenses rose to $4,282,899 from $3,973,342 the year before, leaving an operating income for the first quarter of 1969 of $445,436 compared with $441,637 for the 1968 period. There was a decline in "other income," derived mostly from oil and gas royalties, to $112,469 from $156,276 the year before.

Net income for the first quarter of 1969 amounted to $184,787 equal to 39 cents per share on 475,408 shares outstanding. For the comparable 1968 period, net income was $217,411 or 46 cents per share.

Smaller earnings for the first quarter of 1969 compared with 1968 are attributable to a decline in income from oil

---

CONSOLIDATED STATEMENT OF INCOME

Three months ended March 31,	1969	1968
Net sales	$4,728,335	$4,414,979
Costs and expenses	4,282,899	3,973,342
	445,436	441,637
Other income	112,469	156,276
	557,905	597,913
Provision for depreciation and depletion	373,118	380,502
Income before provision for Federal income taxes	184,787	217,411
Estimated provision for Federal income taxes*	-0-	-0-
Net Income	$ 184,787	$ 217,411
Outstanding shares	475,408	475,408
Net Income per share	$ .39	$ .46

* Sales for 1969 and 1968 include $310,000 and $210,000 respectively of previously deferred coal production payments. Applicable deferred Federal income taxes were offset by the tax effect of percentage depletion allowances, carryforward and other tax credits.

The figures presented in this statement are subject to annual audit.

and gas sources and to losses sustained in operation of our #4 Mine. This mine continues to cause operational difficulties due to faults in the seam. We are hopeful this can be corrected very soon. However, we are happy to be able to report that operating results at all other properties were most satisfactory in the first three months of the year, and we see no reason to anticipate any change in that trend at these mines.

Cordially,

President

May 7, 1969

DEFENDANT'S EXHIBIT 43

REPORT

TO THE SHAREHOLDERS

SIX MONTHS ENDED
JUNE 30, 1969

ZEIGLER
Coal & Coke Company
208 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS 60604

To Our Shareholders:

This report of operating results for the second quarter of 1969 and the first half of the year is accompanied by a dividend check to your order in the amount of 25 cents per share.

For the three months ended June 30, 1969, net income amounted to $363,255 compared to $315,084 in the same period for 1968. Net income per share equalled 74 cents in 1969 against 66 cents in 1968. There were 483,236 common shares outstanding on June 30, 1969, while on June 30, 1968, there were 475,408 shares outstanding. Net sales in the second quarter of this year totaled $4,635,887 compared to $4,070,026 a year ago.

The satisfactory results of the second quarter contributed to an improved showing in the six months ended June 30. Net income of $548,042 in the first half of 1969 compared to $532,495 in the first half of 1968. Reflecting the increased number of shares outstanding this year, profit per share amounted to

---

CONSOLIDATED STATEMENT OF INCOME

Six months ended June 30,	1969	1968
Net sales	$9,364,222	$8,485,005
Costs and expenses	8,214,661	7,478,693
	1,149,561	1,006,312
Other income	171,115	289,754
	1,320,676	1,296,066
Provision for depreciation and depletion	772,634	763,571
Income before provision for Federal income taxes	548,042	532,495
Estimated provision for Federal income taxes*	-0-	-0-
Net income	$ 548,042	$ 532,495
Outstanding shares	483,236	475,408
Net income per share	$ 1.13	$ 1.12

* No provision for Federal income taxes required due to the carry forward of tax credits.

The figures presented in this statement are subject to annual audit.

$1.13 for the first half of 1969 compared to $1.12 in the same period of 1968. Net sales for the first six months of this year were $9,364,222 compared to $8,485,005 in the corresponding period last year.

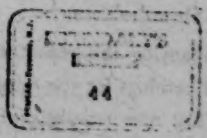
Other income, principally from oil and gas sources, decreased by $118,639 in the first half of this year compared to the first six months of 1968. For the first six months of 1969, other income amounted to $171,115 compared to $289,754 in the first half of last year.

Operating results at our Zeigler #4 mine improved appreciably during the second quarter. Indications are that the improved operating conditions at this mine as well as at all other properties will continue in the months ahead, and satisfactory earnings for the balance of 1969 are anticipated.

Sincerely,

President

August 7, 1969



REPORT

TO THE SHAREHOLDERS

NINE MONTHS ENDED
SEPTEMBER 30, 1969

ZEIGLER
Coal & Coke Company
208 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS 60604

To Our Shareholders:

Accompanying this report of operations and earnings for the third quarter and the first nine months of 1969 is a dividend check to your order in the amount of 25 cents per share.

For the three months ended September 30, 1969, net sales amounted to $4,496,172 compared with $3,563,498 in the same period last year. For the 1969 quarter, net income amounted to $255,787 or 55 cents per share, which compared with a net loss in the 1968 period of $56,324.

For the nine months ended September 30, 1969, net sales totaled $13,860,394. For the same period in 1968, net sales were $12,048,503.

Net income for the first nine months this year amounted to $803,829, equal to $1.68 per share as compared with the $466,171 or 98 cents per share earned in the same period last year.

Under date of August 5, 1969, Texas

CONSOLIDATED STATEMENT OF INCOME

Nine months ended September 30,	1969	1968
Net sales	$13,860,394	$12,048,503
Costs and expenses	12,159,920	10,893,378
	1,700,474	1,155,125
Other income	261,842	393,417
	1,962,316	1,548,542
Provision for depreciation and depletion	1,158,487	1,082,371
Income before provision for Federal income taxes	803,829	466,171
Estimated provision for Federal income taxes*	-0-	-0-
Net income	$ 803,829	$ 466,171
Average shares outstanding	478,704	475,408
Net income per share	$ 1.68	$ .98

* No provision for Federal income taxes required due to the carry forward of tax credits.

The figures presented in this statement are subject to annual audit.

Gas Transmission Corporation notified the Company of its election to exercise its option to purchase the Company's interest in the Bethel Formation underlying the Company's holdings in The Midland Field, located in Muhlenberg County, Kentucky. Independent geological consultants are presently determining the reserves in place which will determine the purchase price. As of this writing, production of gas from the Company's holdings in this field has been terminated.

Sincerely,

President

November 6, 1969

6-10-69 (ATRR)

DEFENDANT'S EXHIBIT 45

TEXT OF REPORT OF NIXON TASK FORCE ON PRODUCTIVITY AND COMPETITION

SUMMARY OF RECOMMENDATIONS OF THE TASK FORCE ON PRODUCTIVITY AND COMPETITION

We present here a summary of the recommendations of the Task Force on Productivity and Competition. These recommendations are elaborated and defended in the accompanying Report.

1. We recommend that the President issue a general policy statement (a) establishing the Antitrust Division as the effective agent of the Administration in behalf of a policy of competition within the councils of the Administration and before the independent regulatory commissions; (b) urging those commissions to enlarge the role of competition in their industries; (c) marshaling public support for the policy of competition.

2. We urge the commissions to permit free entry in the industries under regulation and to abandon minimum rate controls, whenever these steps are possible -- and we think they usually are; and we urge the President, when occasion permits, to appoint at least one economist to membership in each of the major commissions, and institute effective procedures for the review of the performance of the commissions.

3. To enhance the effectiveness of the Antitrust Division, we urge the Attorney General and the Assistant Attorney General in Charge of Antitrust to insist that every antitrust suit make good economic sense, and to institute semi-public conferences to assist in the formulation and frequent reevaluation of enforcement guidelines.

4. We recommend that the Department of Justice establish close liaison with the Federal Trade Commission at the highest levels, with a view toward fostering a harmonious policy of business regulation.

5. We recommend that the Department bring a series of strategic cases against regional price-fixing conspiracies, which we believe to be numerous and economically important.

6. We cannot endorse, on the basis of present knowledge of the effects of oligopoly on competition, proposals whether by new legislation or new interpretations of existing law to deconcentrate highly concentrated industries by dissolving their leading firms. But we urge the Department to maintain unremitting scrutiny of highly oligopolistic industries and to proceed under section 1 of the Sherman Act--which in our judgment reaches all important forms of collusion--in instances where pricing is found after careful investigation to be substantially noncompetitive.

7. The Department of Justice Merger Guidelines are extraordinarily stringent, and in some respects indefensible. We suggest a number of revisions in the accompanying Report.

8. We strongly recommend that the Department decline to undertake a program of action against conglomerate mergers and conglomerate enterprises, pending a conference to gather information and opinion on the economic effects of the conglomerate phenomenon. More broadly, we urge the Department to resist the natural temptation to utilize the antitrust laws to combat social problems not related to the competitive functioning of markets.

9. We recommend new legislation to increase the monetary penalties, at present largely nominal, for price fixing.

10. We urge a new policy for antitrust decrees. The Department should not seek the entry of regulatory decrees: decrees that envisage a continuing relationship with the defendant. Save in exceptional circumstances, all decrees should contain a near termination date, ordinarily no more than 10 years from the date of entry. And the Department should undertake a review of existing decrees to determine which should be vacated as obsolete or inappropriate.

11. The Expediting and Webb-Pomerene Acts should be repealed, and the Robinson-Patman Act substantially revised.

12. Mr. Alexander L. Stott dissents from certain parts of the Report and from certain of the above recommendations. Mr. Raymon H. Mulford dissents from two recommendations.

REPORT OF THE TASK FORCE ON PRODUCTIVITY AND COMPETITION

The Task Force on Productivity and Competition submits its report on the problems which will be confronted by the new administration in this area, and the steps which we recommend to be taken. The report is presented under three general headings:

I. The Administration's Policy of Competition and the Role of the Antitrust Division and the Regulatory Commissions in This Policy.

II. Organization and Procedure in the Antitrust Division.

III. Recommendations for Change in Antitrust Policy.

Individual task force members would often change the emphasis of the Report, and larger differences are presented as dissents.

I. General Policy

A. Antitrust Policy

The American Way, as we are constantly told, is to rely upon competitive private enterprise to do most of the work of allocating resources to industries and firms, organizing production, and providing economic progress. We are constantly travelling a shorter distance down this Way, however: for good reasons and for bad we have almost continuously expanded the governmental controls over economic life, and in recent years important restrictions have been placed upon private enterprise to protect the balance of payments. Some of the vast arsenal of public controls are unnecessary, and a large proportion of the necessary controls are excessively restrictive of competition. As one example, the safety of financial institutions is of course a major public concern, but this safety can often be achieved by insurance or similar devices, and hardly ever requires that competition be suppressed to the extent that the most incompetently managed institution will be prosperous, and hence safe.

The traditional American policy of seeking to minimize regulation of economic life is a profoundly wise policy, and deserves to be reasserted and implemented. Both logic and political expediency -- not always close allies -- dictate that economic freedom be subjected to the discipline of competitive markets. We believe, therefore, that the President should issue a general policy statement on competition and public regulation, to achieve at least three important purposes:

1. To establish the Antitrust Division as the effective agent of the Administration in behalf of a policy of competition, in intragovernmental groups, and before independent regulatory bodies.

2. To encourage and urge the regulatory bodies -- which cannot ignore the clear policy positions of the President even when his appointive power is dormant -- to enlarge the role of competition in their respective industries.

3. To revive and strengthen public support for the policy of competition, and to establish the bona fides of the Administration as the protector of both consumer and businessman.

An executive order or a major presidential address would be an appropriate vehicle for this declaration. Whether or not a formal statement commends itself, we believe that the correct policy is one of persistent and resourceful exploitation of competition wherever possible.

B. The Policy of Competition in the Regulated Industries

Our mandate to examine productivity and competition in the American economy compels us to brief examination of the work of the regulatory commissions themselves. The regulated industries comprise one-eighth or more of the economy in terms of income, and are too important to be omitted from our Report.

The tasks assigned to the regulatory agencies are various: to prevent monopoly pricing (as with telephone and pipelines); to prevent congestion (as with radio and television frequencies); to provide safety to savers (as with financial institutions); and so on. It is not possible for us here to examine these purposes critically, although it is notorious that in certain industries (such as motor trucking) there is no respectable case for economic regulation. There is widespread disenchantment with regulatory purposes as well as regulatory processes, and a general belief that excessive rigidity, expensive review of economically trivial details, and frequent failure to achieve any important results have characterized our regulatory efforts.

In two directions, we are convinced, there should be a major reorientation of the regulatory policy:

1. Entry of new firms should be encouraged wherever an absolute contradiction with regulatory goals is not involved. At present the practice is universally the opposite: to prohibit or ration with utmost severity the entrance of new firms.

2. Allow much freedom in price competition. The regulatory bodies should abandon minimum rate regulation whenever possible (and it is usually possible), and rely chiefly on maximum rate regulation.

Where rates are regulated, it is essential to make both changes: there is little merit in allowing additional firms to enter if they are not held to the test of unfettered competition with the existing firms.

We urge the Administration to pursue three complementary paths of reform in the regulated industries:

First, the commissions should have the merits of competition pressed upon them. Competition is not a matter of all or none, and the fact of regulation should not exclude competition as a force at each of a hundred points where it is relevant and feasible. If there must be only one railroad there can still be several truckers, several freight forwarders, and the possibility of inter-modal competition.

Second, the primary method of giving a larger role to competition is by appointing commissioners who understand and believe in a policy of competition. We believe that every regulatory body should have at least one economist as a commissioner. Quite aside from the implementation of the desire for more competition, this proposal has a decisive defense: economic regulation poses more economic than legal problems, and an economist knows more about economics than a non-economist. The economic triviality and irrelevance of much activity of the regulatory commissions is patent and inexcusable.

Third, the regulatory commissions are largely out of public control. Once in a decade or two, at most, a commission will be investigated by Congress. The Administration should explore methods of getting more meaningful and effective reviews than we now get. We do not know whether the best method is an enlarged Bureau of the Budget section, a national commission, the creation of academic review committees, or a special adviser to the President. The best method, however, is surely not infrequent, partisan Congressional review. The present role of the regulatory bodies is undirected, unmeasured, and unevaluated.

II. Organization and Procedure in the Antitrust Division

A. The Utilization of Economic Knowledge

We anticipate little opposition to the proposition that the Antitrust Division make full and effective use of economists and their special skills. These skills are often necessary to understand the effects of economic practices (an example is market-sharing in fixed proportions), to assess the economic importance of individual cases, and to assist in devising remedies that will not shatter on economic realities. We endorse the policy of having a highly professional economist serving as adviser to the head of the Division, and a strong permanent staff of economists.

The problem is not the goal of an economically sophisticated antitrust policy, but its implementation. A division charged with the enforcement of a statute must of course be directed and largely staffed by lawyers. Unless there are substantial incentives to the staff to utilize economics -- whether by central direction, or vastly more powerfully, by demonstrated assistance in winning cases -- the non-lawyer will often be viewed by the lawyers as a mysteriously necessary obstacle to smooth operations. The Assistant Attorney General will have succeeded in making a truly major contribution to antitrust policy if he establishes the relevance of economic knowledge.

B. The Development of Criteria for Classes of Cases (Guidelines)

When the Antitrust Division is confronted by a large number of similar cases -- and it must now be scanning many hundreds of mergers each year -- it will inevitably have rules to guide the numerous men who pass on individual cases. The question is not whether to have criteria or guidelines, but how to arrive at them.

We believe, for reasons we discuss below, that the present merger guidelines are questionable in important respects. Here we consider the procedures for formulating guidelines.

A set of rules for a class of cases will be desirable only if two conditions are fulfilled:

1. There are a large number of uncontroversial, easily identified cases. If there are not, the rules give little help to either business or the Division.

2. Controversial or objectionable cases cannot be repackaged to avoid scrutiny.

The way to determine whether mergers, for example, meet these conditions is to examine a large number of them in the light of legal and economic knowledge. The Antitrust Division will perform this task vastly better if it uses the large amount of professional expertise available outside the Division. We therefore recommend that the Division have semi-public conferences to explore difficult areas of policy, inviting legal and economic experts to propose or discuss guidelines. Some members of the task force would prefer to have formal notice and public hearings in establishing rules. If rules are adopted, a periodic review of them by the same procedure will be a useful method of conferring flexibility upon them. A specific application of this method is proposed below for mergers.

C. The Role of the Federal Trade Commission

No review of antitrust policy would be complete that ignored the Federal Trade Commission, which is charged with enforcement of, among other statutes, the Clayton Act, of which Section 2, the Robinson-Patman Amendment, and Section 7, prohibiting mergers and acquisitions that may substantially lessen competition, are particularly important; and the Federal Trade Commission Act, whose operative provision, Section 5, forbids "unfair or deceptive acts or practices", a term that has been interpreted to embrace even more than the vast area of anticompetitive behavior proscribed by the Sherman and Clayton Acts, as well as consumer fraud and some "immoral" sales methods such as lotteries. As is evident, the Commission's jurisdiction largely overlaps that of the Antitrust Division.

In its antitrust work, the FTC has concentrated on price discrimination, on practices believed to oppress or coerce small dealers, and on mergers, especially vertical and conglomerate, and usually in industries such as food products, groceries, and cement--industries which by long-established understanding with the Antitrust Division have been assigned as the Commission's sphere of primary competence.

Unhappily, little that the Commission undertakes in the antitrust area can be defended in terms of the objective of maintaining and strengthening a competitive economy. Consider price discrimination. There is now an impressive body of literature arguing the improbability that a profit-maximizing seller, even one with monopoly power, would or could use below cost selling to monopolize additional markets. Yet, not only has the Commission continued to bring predatory price discrimination cases, but the alleged danger of predatory pricing remains a principal prop of its vertical and conglomerate antimerger cases. As for "secondary line" discrimination (that is, giving discounts to some dealers or distributors but not to others who compete with them), the Commission has never attempted to differentiate those cases (if there are any) in which a monopolistic buyer is able to extract unjustified price concessions from his suppliers to the prejudice of his competitors from those in which discrimination is employed by oligopolistic sellers who wish to cut prices secretly,--and should be encouraged to do so--and those in which price differences (which the Commission tends to equate, erroneously, with discriminations) are not, in fact, discriminatory. Over the last eight years the Commission, often under the prodding of reviewing courts, has pulled some of the sting from enforcement of Robinson-Patman against secondary-line discrimination. It has demanded somewhat stronger proof of competitive injury; the meeting-competition and cost-justification defenses have been rendered meaningful; and the provisions of the Act relating to advertising allowances and brokerage payments are, in general, no longer used to compel sellers to compensate for services that are not economically beneficial to the seller (such as advertising by tiny retail outlets or brokerage when a broker's services can be dispensed with). Although the retreat from per se rules against secondary-line discrimination has led to a general diminution of enforcement activity by the FTC (private suits continue, of course, and are discussed later) the Commission still brings many cases that impair, rather than promote, competition and efficiency. For example, the Commission has in recent years waged vigorous war against "functional discounts", which are discounts offered to middlemen who perform certain distributive functions (such as warehousing) that other middlemen, who are not given the discounts, do not perform. Moreover, as explained later in this Report, we can conceive of no case of discrimination in which the Sherman Act would not provide an adequate remedy--adequate, that is, to protect the interest in maintaining an effectively competitive economy--and so we view Robinson-Patman enforcement as inherently likely to be pushed beyond proper limits.

The efforts of the Commission to protect small dealers from allegedly unfair and coercive business practices constitute a dark chapter in the Commission's history. Much of this enforcement activity does not eventuate in formal proceedings. What happens is that a dealer who is terminated, for whatever reason, is likely to complain to the Commission, knowing that the relevant Commission staff is well disposed toward "small business". The staff uses the threat of an FTC proceeding to get the supplier to reinstate the dealer, and if threats fail--usually they succeed--the FTC may file a complaint charging the supplier with having cut off the dealer because he was a price cutter, or for some other nefarious reason. Our impression, in sum, is that the Commission, especially at the informal level, has evolved an effective law of dealer protection that is unrelated and often contrary to the objectives of the antitrust laws. The Commission is supported in this endeavor by the Supreme Court's ruling that Section 5 of the FTC Act empowers the Commission to suppress practices that resemble antitrust violations.

With respect to the Commission's enforcement policy in the merger field, it is illuminating to compare the recent statements of Commission merger policy with the Department of Justice Merger Guidelines, discussed elsewhere in this Report. The Commission is even more severe. Unlike the Department, it attaches a good deal of significance to the absolute size (independent of market share) of merging firms; to the alleged power that large firms have over small; and to the dangers of "price squeezes".

It will, for example, challenge virtually any acquisition by a cement producer of a ready-mix concrete company, virtually any substantial acquisition by a large food chain, etc. The Merger Guidelines are models of restraint compared to those promulgated by the Commission, which are as hard on economic theory as on mergers.

We conclude that substantial retrenchment by the Commission in the antitrust field is highly desirable. In addition to retrenchment (at least by stopping the increase of the Commission's appropriations), its resources devoted to regulating competition might be redeployed. The two principal possibilities are (1) consumer protection, and (2) economic studies utilizing the very broad fact-gathering powers vested in the Commission by its enabling legislation. Unhappily, either route could be followed in a way that endangered competition. An incompetent economic study can be influential on policy makers -- witness the influential 1948 FTC study which erroneously suggested that concentration was on the rise in American industry. Overzealous enforcement of consumer-protection legislation can also have errant results. We note that the application of consumer-protection law is almost always invoked not by consumers but by competitors, whose interest lies in protecting their market, not in giving consumers full information; and that elaborate requirements relating to packaging, safety, etc. can curtail consumer choice, limit competition, reduce the consumer's incentive to exercise care, and -- what is most serious -- impose substantial costs on society.

The Federal Trade Commission urgently needs a basic reform, but this need will be difficult to fulfill. Quite apart from the fact that there are no vacancies on the Commission, any dramatic or far-reaching Presidentially-inspired reforms would run up against the long tradition of regarding the independent agencies in general -- and the FTC in particular -- as "arms of the Congress." That has at times meant an office of economic opportunity for Congressmen; more important, it means that a strong showing of Presidential interest in the operations of the Commission will not be welcome on the Hill.

Perhaps the best short-run path of improvement runs through the offices of the Attorney General and the Assistant Attorney General in charge of Antitrust. Since the jurisdictions of the Commission and of the Antitrust Division are so largely overlapping, no one could object to the establishment between the Commission and the Division of close liaison at the highest levels. Indeed, it is something of a wonder (though explicable in terms of bureaucratic rivalry) that such liaison has been wholly lacking heretofore; the only coordination between the agencies is at very low levels, and consists largely of haggling over who shall sue in cases where both agencies are interested. Especially at the beginning of a new Administration, it should be quite feasible, as well as wholly appropriate, for the Attorney General and Assistant Attorney General to establish a close cooperative relationship with the Chairman of the Commission. We think it likely that the Commission will pay some heed to the Department's views, if forcefully expressed, on antitrust and trade-regulation policy.

III. Recommended Changes in Antitrust Policies

The general policies of the Antitrust Division are profoundly good, and we propose no major change in its emphasis or directions of policy. In fact, the main thrust of the following recommendations is that certain recent developments of policy or doctrine should not be allowed to divert the agency from its basic task of striking down conspiracies and mergers in restraint of trade.

A. Price-Fixing

The price-fixing cases of the Antitrust Division are its bread and butter, and understandably its staff would prefer more cake. We emphasize the great economic and social importance of continued, vigilant, aggressive seeking-out and conviction of conventional price-fixers. Every victory weakens the efficiency of undetected collusion in that area of economic life. We strongly recommend the bringing of a series of strategic cases against regional conspiracies, which we believe to be numerous and economically important.

B. Concentration and Oligopoly

Oligopoly -- the industry composed of a small number of independent enterprises -- undoubtedly presents the most difficult problems in a policy for competition. The difficulties arise because of a combination of three circumstances. The first is factual: there are many important industries in our economy whose structure is oligopolistic -- how large a number depends upon what a "small number of firms" means. The second is interpretive: the economists have not succeeded in fully identifying the characteristics of an industry which determine whether it will behave competitively or monopolistically. The third is the matter of action: if firms in an oligopolistic industry are convicted of collusive behavior, must one press for a remedy so radical as dissolution in order to stop future repetitions of the offense? (And should the standards of permissible concentration be wholly different for pending mergers than for established enterprises?)

The circumstances which determine whether or not the firms in an oligopolistic industry will usually behave more or less competitively (seeking by independent actions to improve their individual profits at the cost of rivals' profits, with the eventual general erosion of unusual profits) are partly known:

1. The easier (quicker and cheaper) new firms can enter the industry, the smaller and more short lived will be the monopolistic restrictions.

2. The more elastic the demand for the product of the oligopolistic industry the less the reward from restrictions of output below the competitive level, and hence the less the inducements to act collusively. This in turn usually depends upon what alternative products the buyers may turn to.

3. The larger the effective number of firms the less the probability of collusive behavior -- collusion increases in expense (including probability of detection) as numbers increase. However, a given number of firms is more likely to result in collusion, the more concentrated is production in the hands of a few firms. If we correct for this and take the effective number of rivals to be the number of rivals of equal size which would produce the same competitive situation as the firms (not of equal size) actually in the industry, the effective number may be very roughly estimated at twice the number there would be if all firms were as large as the largest in the industry.

That is, if the largest firm has 1/5 of the industry's output and the remaining firms fall off in size regularly, the effective number of firms is of the order of magnitude of 10. By this is meant that the concentration in the industry is equivalent to what would exist if there were 10 firms of equal size.

There are other influences which probably but less certainly affect the probability of competitive behavior. One of these is the size of buyers: larger buyers, for a variety of reasons including possibility of backward integration, make for more competitive prices.

Numerous statistical studies have been made of the relationship between concentration and rates of return on investment, and these studies generally yield positive but loose relationships: concentration is not a major determinant of differences among industries in profitability, although it may sometimes be a significant factor. It appears also to be true that somewhere between five and ten effective rivals (i.e., a largest firm with a share of 1/5 to 1/5) are usually enough to insure substantial elimination of the influence of concentration upon profitability.

Concern with oligopoly has led to proposals to use the antitrust laws (perhaps amended) to deconcentrate highly oligopolistic industries by dissolving their leading firms. We cannot endorse these proposals on the basis of existing knowledge. As indicated, the correlation between concentration and profitability is weak, and many factors besides the number of firms in a market appear to be relevant to the competitiveness of their behavior. While a flat condemnation of oligopoly thus seems to us unwise, we commend to the Antitrust Division a policy of strict and unremitting scrutiny of the highly oligopolistic industries. If, in any of these industries, pricing is found after careful investigation to be substantially noncompetitive, the Division will have a clear basis for proceeding against the leading firms under Section 1. Collusion that can be inconvertibly inferred from behavior (such as persistent, stable price discrimination in the economist's sense) should not bring immunity from the Sherman Act, and we are confident that structural remedies will be sanctioned by the courts in cases where, due to number of firms and the other conditions of the market, lesser remedies are likely to be unavailing. In assessing the gain from such structural remedies, account should be taken of any reduction in efficiency which the remedy entails.

The concern with oligopoly is also quite visible in the Department of Justice's most recent innovation, the Merger Guidelines, to which we now turn.

C. Mergers and the Guidelines

The present merger Guidelines impose stringent restrictions upon the relative sizes permitted to companies which desire to merge. The impact of these percentages is reinforced by a definition of the market (within which shares of companies are reckoned) so loose and unprofessional as to be positively embarrassing. We propose to reverse this emphasis: not to tell companies which mergers are forbidden, but which mergers are permitted. We are persuaded that this orientation better serves the interests of both business and the Antitrust Division. Before we turn to the methods by which more appropriate Guidelines for mergers are achievable, we shall briefly discuss the present Guidelines, and indicate our reasons for dissatisfaction with them in their present orientation.

Market Definition. The delineation of a relevant market within which to appraise the lawfulness of a merger is crucial, for if the market is drawn narrowly enough, virtually any merger can be made to seem monopolistic in its effects. Unfortunately, as they are presently drafted the Guidelines seem to invite a substantial degree of market gerrymandering, especially in delineating regional or local markets. The Guidelines' test of whether a product is sold in less than a national market is loose. Any group of competing sellers in the industry is a relevant market, unless the defendant can show that there is no "economic barrier" preventing other sellers from selling in the particular area. Such a barrier may consist of freight costs, customer inconvenience, customer preference for the brands presently sold in the area, or the absence of good distribution facilities.

This is a misleading test. An industry may be riddled with the kind of "barriers" cited in the Guidelines and yet still not contain any meaningful local markets. An example will illustrate. Assume that the price of steel bars is $2 in Minnesota and $1.60 in Chicago, and the cost of shipping the bars from Chicago to Minnesota is 41 cents. On these facts, it is plain that the Minnesota sellers could not raise their price significantly without immediately losing their business to the Chicago sellers. Minnesota is thus not a meaningful local market even though, at the existing price, freight costs do impose an effective economic barrier against the Minnesota sellers. Moreover, additional firms will establish production or distribution facilities in Minnesota if it becomes profitable to do so. The same analysis can be extended to the other barriers discussed in the Guidelines.

In criticizing the test of "economic barrier", we do not mean to deny the difficulty of devising rules of market definition that will be at the same time simple and sensible. This is most probably not an area in which Guidelines provide a useful enforcement tool. If there are to be Guidelines, though, they should at least not misstate the applicable economic theory. It would, accordingly, be a decided improvement if the Guidelines were revised (at a minimum) to explain that a distant seller of a product must be included in the local market if a modest price increase in the local area--a price increase unrelated to his costs--would bring him in forthwith.

Horizontal Mergers. The provisions of the Guidelines governing horizontal mergers--that is, mergers between direct competitors--are extraordinarily strict. If a market is "highly concentrated" (defined as where the 4 largest firms account for at least 75 percent of the sales in the market), then a merger between two firms, each of which has a 4 percent market share, will be challenged; and if the acquiring firm has a share as large as 15 percent, then the acquired firm need have only a 1 percent share for the merger to be challenged. Different levels of permissible size are stated for less concentrated industries, and some account is taken of the trend of concentration.

We agree with the basic premise of the horizontal-merger provisions of the Guidelines that market-share percentages are the appropriate touchstone of illegality for such mergers. We would favor levels of concentration modestly lower than those now used (but differently structured), with the purposes of (1) allowing all mergers below the Guidelines levels, and (2) not prohibiting, but reviewing, those above the critical level, with an implied probability that the more a proposed merger lies above the level of automatic approval, the less the probability of its acceptance. We discuss below the procedure that should be followed better to utilize existing knowledge in fashioning the Guidelines.

Vertical Mergers. A merger that involves the acquisition not of a competitor but of a customer or a supplier is a vertical merger, and the present Guidelines contain strict provisions limiting such mergers. For example, if the supplying firm in the merger has a 10 percent share of its market and the purchasing firm has 5 percent of the purchases in that market, the merger will be challenged.

Our task force is of one mind on the undesirability, of an extensive and vigorous policy against vertical mergers: vertical integration has not been shown to be presumptively noncompetitive and the Guidelines err in so treating it. Within this area of agreement there are two positions around which the task force members cluster.

The one position asserts that many, and perhaps most, vertical mergers which do not have direct horizontal effects are innocuous, but that in certain situations a vertical merger will have anti-competitive effects. These situations include: increases in the capital or other requirements for an integrated firm may reduce the possibility of new entry; or price discrimination may be implemented when a monopolist integrates forward or backward. A showing that an anticompetitive effect of these sorts exists is essential before a vertical merger is challenged.

The other position denies that a vertical merger has the potentiality for economic harm in the absence of horizontal effects. To some of our members, it is wholly implausible that vertical integration places entering firms at a disadvantage. A seller who fails to minimize his input and distribution costs will be undersold by his competitors: he cannot afford to sell to or buy from an affiliate if there are more efficient alternative means of supply and distribution available to his competitors (and to him). Even if the seller is a monopolist, the desire to maximize profits will lead him to seek the most efficient methods of supply and distribution, and there will be ample opportunities for nonaffiliated suppliers and outlets to compete for his patronage. Except in the case of the monopolist who cannot discriminate in price effectively without control of his outlets, vertical integration will be initiated and maintained only if and so long as it is justified by the cost savings it permits. It is not a method of extending monopoly power.

The two positions coalesce on one policy conclusion: vertical mergers should not be forbidden as a class.

The Conglomerate Merger. The large conglomerate enterprise with an aggressive acquisition policy has only recently become prominent and newsworthy. ***

Antitrust law has seemed to some a convenient weapon with which to attack large conglomerate mergers. If one interprets "elimination of potential competition", "reciprocity", and "foreclosure" as threats to competition, one can always bring and usually win a case against the merger of two large companies, however diverse their activities may be. These are often makeweights. The economic threat to competition from reciprocity (reciprocal buying arrangements) is either small or nonexistent: monopoly power in one commodity is not effectively exploited by manipulating the price of an unrelated commodity. The argument advanced against the simplistic treatment of vertical mergers--essentially that one cannot use the same monopoly power twice--also challenges the fears of reciprocity.

Potential competition, on the contrary, can be a decisive limitation on the exercise of market power, and a merger which eliminates an imminent new competitor is anticompetitive. If entry into a field is relatively easy, however, there are a vast number of potential entrants and the elimination of one or a few has no effect. If entry is difficult, and only a select few firms are capable of entry and on the record likely to enter, their independence should be preserved. The identity of potential entrants should not be established by introspection. If the producer of X is truly a likely entrant into the manufacture of Y, the likelihood will have been revealed and confirmed by entrance into Y of other producers of X (here or abroad), or by the entrance of the firm into markets very similar to Y in enumerable respects.

We seriously doubt that the Antitrust Division should embark upon an active program of challenging conglomerate enterprises on the basis of nebulous fears about size and economic power. These fears should be either confirmed or dissipated, and an important contribution would be made to this resolution by an early conference on the subject. If there is a genuine securities market problem, probably new legislation is necessary. If there is a real political threat in giant mergers, then the critical dimension should be estimated. If there is no threat, the fears entertained by critics of the conglomerate enterprises should be allayed. Vigorous action on the basis of our present knowledge is not defensible.

The central task of the Antitrust Division is to preserve competition in the American economy. This is a splendid and challenging task and deserves and requires the full resources of the Division. We shall be much the losers if we compromise the discharge of this central task by burdening the Division also with tasks such as the combatting of organized crime or the achievement of general political goals.

The Use of Conferences. We have proposed that conferences be used to revise the Guidelines and to identify the problems, if any, created by the large conglomerate enterprise. The conference will allow the Antitrust Division to utilize the expertise and wide factual knowledge of economists, lawyers, securities analysts, and other groups without the laborious machinery of formal hearings. We strongly recommend that before such conferences are held, leading students and exponents of particular positions be asked to prepare position statements which present explicit and specific theories and evidence. Then the conference members will have specific questions to address and specific views to combat or support.

D. Antitrust Sanctions

The cutting edge of law is not the abstract statement of a legal duty but the sanction provided for its nonperformance, and that is true of the antitrust laws as of other systems of legal obligation. It is essential that those laws clearly and accurately define and forbid the practices that impair competition and efficiency but it is equally essential that the sanctions for violation be effective in compelling compliance and with a minimum of undesirable side effects.

In testing the antitrust sanctions by this standard, it will be helpful to distinguish two purposes of sanction: that of preventing (or, if it has already occurred, undoing) a specific violation; and that of deterring violations that might not always be detected.

Sanctions of the first type--remedial sanctions--suffice where there is no problem of detection (e.g., in the case of an illegal merger). But take the case of price-fixing. Price-fixing conspiracies can be, and one suspects are, successfully concealed. A sanction that merely prevented the continuation of the conspiracy, such as an injunction, or one that merely restored the losses of the injured consumers, such as ordinary damages, would in these circumstances probably be insufficient. For in deciding whether to comply with the law, a seller would discount the very modest (or negligible) injury to him if his participation in a price-fixing conspiracy was detected, and he was required to stop and to pay actual damages, by the considerable probability that he would escape detection altogether; and he could conclude that he had little to lose by participating. That is why punishment by fine or imprisonment is an appropriate sanction for illegal price-fixing: it provides deterrence, as the purely remedial sanction does not.

But the deterrent sanction in antitrust is weak. A price fixer can be imprisoned and fined but prison terms are almost never imposed in price-fixing cases and when they are, they are nominal in length; and the maximum fine of $50,000 will deter only a very small corporation. The possibility of a private treble-damage suit doubtless provides additional deterrent effect, but there are serious limitations: judges are reluctant to authorize damage awards that seriously hurt a company; damages are difficult to prove in price-fixing cases; and most important, the injury caused by a price-fixing conspiracy is often so widely diffused (for example, among millions of consumers) that no one has an incentive to bring a suit. The government itself can sue for damages only when it was the victim of the unlawful conspiracy.

If concealable offenses under the antitrust laws are to be effectively deterred, either the resources devoted to the detection of such offenses must be vastly augmented--and there are obvious limitations to this route--or the fines must be increased to a point where they will give even the large corporation considerable pause before participating in (or condoning its officers' individual participation in) an illegal conspiracy. Precedent for much more severe sanctions can be found abroad. The European Economic Community, for example, may impose penalties of up to $1,000,000, or, in the case of willful violations, up to 10 percent of annual sales. We have not attempted to determine the appropriate level of antitrust fines, but we urge the Department of Justice to accord high priority in its legislative program to the upward revision of these penalties.

The creation of a more realistic scheme of antitrust fines would enable a long-overdue reexamination of the punitive aspects of the private antitrust suit. It is anomalous that private plaintiffs who have done nothing to uncover or prove an antitrust violation (the usual case) should be permitted to claim treble damages on the basis of a judgment obtained by the Antitrust Division. In such circumstances, the excess over actual damages and costs represents a pure windfall to the private plaintiff. Today, one can defend this arrangement on the ground that it furnishes an element of added deterrence which is necessary in light of the inadequacy of the existing criminal fines. But that ground would be removed if the fines were revised to a more appropriate level; and a more rational scheme of deterrence would become feasible. We are also deeply concerned that private treble damage suits provide undesirable opportunities for harassment and the furtherance of a variety of anticompetitive practices.

With regard to remedial sanctions, the principal question involves the undesirable side effects that frequently accompany a poorly formulated decree. Ideally--and it is an attainable ideal--an antitrust decree should be a "one shot" affair: dissolving the monopoly, or divesting the acquired assets, or terminating the basing-point system, etc. The antitrust laws were never intended to be a system of continuing regulation. Antitrust policy has as its basic principle the preservation of a competitive environment within which individual enterprises are free from continuing supervision. When a decree says, in effect, "Let us return to the court, or give the power to the Antitrust Division, to adjudge the propriety of various behavior of the defendant for years to come," one can be sure that the suit has failed in its purpose of restoring competitive conditions. Nor is the Department equipped to function as a regulatory agency, and it is not likely to escape that common pitfall of economic regulation, the suppression of competition. Nonetheless, such decrees are frequently entered, especially by consent of the parties in cases where the Department (or the Federal Trade Commission, to which these remarks apply with equal, if not greater, force) is unsure of its litigation prospects and wishes to salvage something from the investment of enforcement resources.

For the future, we urge that the Department adopt a firm policy of not proposing or accepting decrees that envisage a continuing, regulatory relationship with the defendant. A correlative policy that we suggest is that every decree contain a definite--and near--termination date, ordinarily no more than 10 years from the date the decree is entered. Such a principle would compel the Department to devise decrees that restore competition rather than establish regulation, as well as assure that decrees do not remain in effect long after the relevant industrial conditions have changed (such as with the 1920 decree against the meat packers).

Little is known of the extent to which a large number of past decrees are still operative, and if operative, of any real value in protecting competition. We recommend, therefore, some such procedure as this in dealing with outstanding decrees:

1. The past decrees still running should be compiled, and the types and duration of prescribed conduct summarized.

2. The current relevance of the decrees, or at least those running against large industries, should be examined--presumably by the economics section of the Antitrust Division.

3. The older (say 25 years and over) and obsolete younger decrees should be vacated.

E. Recommended Changes in Antitrust Statutes

Several legislative reforms could improve substantially the functioning of the antitrust laws. We have recommended above a substantial increase in the maximum level of fines. In addition, we recommend immediate repeal of the Expediting Act. The low quality of many Supreme Court antitrust opinions can be traced in no small measure to the fact that direct appeal frequently requires the Supreme Court to pass on an extensive record without the benefit of the winnowing and focusing process involved in an intermediate appeal. The Supreme Court itself has noted that direct appeal is unsatisfactory. If repeal is politically impossible, then an amendment that would drastically limit the number of direct appeals would be desirable.

The Webb-Pomerene Act should also be repealed. The creation of cartels in foreign commerce is antithetical to the underlying theory of the Sherman Act. The danger that exempted cooperation between competitors in the export field will lead to illegal cooperation at home is too great to be viewed as merely a potential abuse. Nothing in U. S. domestic competition policy or foreign economic policy warrants the retention of this outmoded approach to international competition.

On the agenda for long-term legislative reform must be the Robinson-Patman Act. The Act leads to rigidity in distribution patterns and to uniform, inflexible pricing. In industries with few sellers, price reductions are more likely to be made if they can be made covertly. Such limited reductions often lead over time to generally lower prices. Thus, a prohibition against price discrimination may preclude the kind of competition that is most likely to lead to lower prices in oligopolistic industries. We view the Federal Trade Commission's tendency in recent times to relax the enforcement of the Act as a desirable but, so long as private treble damage actions are available, an inadequate reform.

In reforming the Robinson-Patman Act, two kinds of amendment are desirable. First, the general prohibition against price discrimination in Section 2(a) should be made more supple by broadening the meeting competition and cost justification defenses so as to make them more readily available for sellers whose price differentials do not stem from a predatory purpose and do not injure competition in the market place (as opposed to disadvantaging individual firms). Second, the more absolutist brokerage, payments and services prohibitions of subsections (c), (d) and (e) should be repealed while making clear that the standards of amended subsection (a) remain applicable to practices that would previously have been treated under those repealed subsections. The Task Force recognizes the political support that the Robinson-Patman Act retains in some quarters and the danger that an attempt to amend the Act might give particular interests an opportunity to add even more restrictive provisions. As a consequence, some of our members view amendment of the Act as a long-term, albeit important, reform; others wish to leave it alone.

- 0 -

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff,	)	CIVIL ACTION
v.	)	NO. 67 C 1632
GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, Defendants.	)	

ANSWERS TO INTERROGATORIES
OF THE DEFENDANTS

Interrogatory 1

Define the following terms or phrases as used in the complaint:

(a) "western Indiana" (Par. 7)

Answer: "Western Indiana" is defined as approximately the western two-thirds to three-quarters of the State of Indiana.

(b) "western Kentucky" (Par. 7)

Answer: "Western Kentucky" is defined as approximately the western one-half of the Commonwealth Kentucky.

(c) "western Tennessee" (Par. 7)

Answer: "Western Tennessee" is defined as approximately the western one-third to one-half of the State of Tennessee.

(d) "eastern Missouri" (Par. 7)

Answer: "Eastern Missouri" is defined as approximately the eastern one-third to one-half and the south central portion of the State of Missouri.

(e) "eastern Iowa" (Par. 7)

Answer: "Eastern Iowa" is defined as approximately the eastern one-half to two-thirds of the State of Iowa.

(f) "southwestern and central Wisconsin" (Par. 7)

Answer: "Southwestern and central Wisconsin" is defined as approximately the entire State of Wisconsin with the exception of the eastern one-quarter to one-third of the State which is situated to the west of Lake Michigan and with the exception of the northwest portion of Wisconsin which is situated to the south of Lake Superior.

(g) "southeastern Minnesota" (Par. 7)

Answer: "Southeastern Minnesota" is defined as approximately the southeastern quarter of the State of Minnesota and includes, principally, the cities of St. Paul and Minneapolis and their environs.

* * *

(j) "coal reserves which can be recovered" (Par. 9)

Answer: This phrase means coal reserves which can be mined, that is "recovered," under present and future technological capabilities.

* * *

Interrogatory 6

Does plaintiff contend that there are other appropriate "sections of the country" (within the meaning of Section 7 of the Clayton Act) within which to test the legality of the challenged acquisitions of UEC stock? If so, specifically define each such area and state the facts and identify the data upon which plaintiff relies in supporting each such contention.

Answer: The plaintiff does not at this time contend that there are other appropriate sections of the country within which to test the legality of the acquisition of UEC by GD.

Interrogatory 7

With reference to Paragraph 8 of the Complaint, for each "section of the country" designated by plaintiff as "appropriate" in answer to Interrogatories 4 through 6, state which, if any, of the following fuels plaintiff contends do not compete with bituminous coal in such "section of the country" in "providing a dependable and low cost source of energy," and state the facts and identify the data upon which plaintiff relies in supporting such contention:

(a) Gas
(b) Oil
(c) Nuclear energy
(d) Lignite
(e) Water

Answer: The answer to this question is now being investigated by the plaintiff. However, the plaintiff directs the defendants' attention to the Keystone Coal Buyers Manual 1967, at pages 243-248, 250, 254-258, 269 and 273-274, and to the National Coal Association's Bituminous Coal Facts 1966, at pages 85-87 and 90.

Interrogatory 8

Does plaintiff contend that the "Eastern Interior Coal Province sales area" is an area anywhere within which coal mined at any location in the Eastern Interior Coal Province is able to compete with coal mined at any other location in the Eastern Interior Coal Province?

(a) If so, state the facts and identify the data upon which plaintiff relies in supporting this contention.

Answer: The plaintiff contends "that approximately 80 per cent of the bituminous coal consumed in the Eastern Interior Coal Province sales area was produced in the Eastern Interior Coal Province." In support of this allegation, the answer to Interrogatory 3(c), above, is herein fully incorporated.

(b) If plaintiff does not so contend, for each of the mines in Illinois, Indiana and Kentucky listed in Appendix A, attached hereto,

(1) Identify every other mine in the list with which such mine does or can compete, and the name and location of customers for which such mines do or could compete.

(2) Identify every other mine in the list with which such mine does not or cannot compete.

(3) With respect to each mine in the list owned by Freeman or UEC, identify every other mine not included in the list with which plaintiff contends such Freeman or UEC mine does or can compete, and the name and location of customers for which such Freeman or UEC mine and such other mines as are named do or could compete.

(c) For each answer to Interrogatory 8(b)(1), (2) and (3), state the facts and identify the data upon which plaintiff relies in supporting its answers.

Answer: The plaintiff has at present no information in response to Interrogatory 8(b) and (c).

Interrogatories 9, 10, 11, 12, 13, 14 and 15

13. Identify the twenty largest (in terms of total tons produced from mines within Illinois) coal producers operating mines within the State of Illinois in 1967 and, for each, state total nationwide production, production from mines within the Eastern Interior Coal Province, and production from mines within the State of Illinois, all for the year 1967.

14. With reference to Paragraph 19 of the Complaint, identify all coal producers referred to in the answers to Interrogatories 9 through 13, which plaintiff contends are "leading" producers and state the facts upon which plaintiff relies in supporting each such contention.

15. With reference to Paragraph 19 of the Complaint, identify all coal producers referred to in the answers to Interrogatories 9 through 13, which plaintiff contends are not "leading" producers and state the facts upon which plaintiff relies in supporting each such contention.

Answer to Interrogatories 9, 10, 11, 12, 13, 14 and 15: The schedule entitled "REPORT OF MINE PERFORMANCE . . . JANUARY THROUGH SEPTEMBER 1966 AND 1967 FOR ILLINOIS, INDIANA AND WEST KENTUCKY, BY DISTRICTS," which was prepared by the Mid-West Coal Producers Institute, Inc., sets forth tonnage figures of the leading producers. A copy of this schedule is attached to Plaintiff's Answers to the Defendants' Interrogatories and is herein fully incorporated. Supplemental answers will be made when and if additional information is obtained.

Interrogatory 17

Does plaintiff contend in this action that any competitor of any of the defendants has been or will be adversely affected or disadvantaged in its ability to compete by reason of the challenged acquisition of UEC stock? If plaintiff so contends:

(a) Identify each such competitor and state with which defendant or defendants such competitor competes.

(b) For each competitor listed in answer to Interrogatory 17(a), describe each "line of commerce" and each "section of the country" (within the meaning of Section 7 of the Clayton Act) in which such competitor's ability to compete has been or will be adversely affected or disadvantaged.

(c) For each such competitor identified in answer to Interrogatory 17(a), state the manner in which, and the nature and extent to which such competitor's ability to compete has been or will be adversely affected or disadvantaged in each "line of commerce" and "[illegible] each section of the country" described in answer to Interrogatory 17(b).

(d) State the facts and identify the data upon which plaintiff relies in supporting its answers to Interrogatory 17(a) through 17(c).

(e) State the name, address, firm and position of each person (other than employees of plaintiff) known by plaintiff to be in possession of evidence or other information concerning any adverse effect or disadvantage which plaintiff contends the challenged acquisitions have had or will have upon any competitor of any defendant.

Answer: The plaintiff has at present no information in response to Interrogatory 17(a)-(e).

Interrogatory 18

State the name, address, firm and position of each officer or employee of any competitor of any defendant interviewed or inquired of by plaintiff or on plaintiff's behalf who has advised that his firm:

(a) Has been adversely affected or disadvantaged in its ability to compete by reason of the challenged acquisitions of UEC stock.

(b) Has not been adversely affected or disadvantaged in its ability to compete by reason of the challenged acquisitions of UEC stock.

(c) Will be adversely affected or disadvantaged in its ability to compete by reason of the challenged acquisitions of UEC stock.

(d) Will not be adversely affected or disadvantaged in its ability to compete by reason of the challenged acquisitions of UEC stock.

Answer: The plaintiff has at present no information in response to Interrogatory 18(a), (c) and (d). The plaintiff's response to Interrogatory 18(b) is as follows:

1. On October 12, 1966, John T. Cusack was informed by H. B. Lee, vice president-sales, Peabody Coal Company, 301 North

Memorial Drive, St. Louis, Missouri, that the acquisition of UEC by GD will probably have no effect on the competitive position of Peabody. In regard to the competitive position of Peabody please see United States v. Peabody Coal Company et al., Civil Action No. 67 C 1621 (N.D. Ill.), and the Final Judgment entered on October 23, 1967.

2. On October 11, 1966, John T. Cusack was informed by W. B. Buchanan, Jr., president of Old Ben Coal Corporation, 10 South Riverside Plaza, Chicago, Illinois, that he did not feel that UEC's acquisition by GD would harm his company.

3. On October 10, 1966, John T. Cusack was informed by Henry C. Woods, president of Sahara Coal Co., Inc., 59 East Van Buren Street, Chicago, Illinois, that he was not concerned about UEC's acquisition by GD.

Interrogatory 20

With reference to Paragraph 20 of the Complaint, state the date after which plaintiff contends UEC and Freeman were no longer "direct and substantial competitors in the sale of bituminous coal" and state the facts and identify the data upon which plaintiff relies in supporting its contention.

Answer: The plaintiff has at present no information in response to this Interrogatory other than to state that on August 4, 1967, Frank Nugent, then president of UEC and Freeman, stated in Washington, D.C. to officials of the United States Department of Justice, Antitrust Division, that in 1966 GD obtained managerial control of UEC. The plaintiff further notes that by December of 1966 GD had acquired at least 90% of the outstanding shares of UEC and shortly thereafter UEC became a wholly owned subsidiary of GD.

Interrogatory 21

With reference to Paragraph 20 of the Complaint, does plaintiff contend that all of the approximately 53% of Freeman's dollar sales and the approximately 61% of UEC's dollar sales which are alleged to have been to the same customers in 1965 were sales that were made, or could have been made, in competition with each other?

(a) If plaintiff does not so contend, identify, by name and location of customer, location of receiving plants and tonnage involved, which of such sales were made, or could have been made, in competition with each other.

(b) If plaintiff does not so contend, identify, by name and location of customer, location of receiving plants and tonnage involved, which of such sales were not made, or could not have been made, in competition with each other.

(c) State the facts and identify the data upon which plaintiff relies in supporting its answers to Interrogatory 21, and, if answered, Interrogatories 21(a) and 21(b).

Answer: The plaintiff has at present no information in response to Interrogatory 21.

Interrogatory 23

State the name, address, firm and position of each officer or employee of any customer of any defendant interviewed or inquired of by plaintiff or on plaintiff's behalf who has advised that his firm:

(a) Has, by reason of the challenged acquisitions of UEC stock, been deprived of actual competition between Freeman and UEC.

(b) Will, by reason of the challenged acquisitions of UEC stock, be deprived of actual competition between Freeman and UEC.

(c) Has not considered Freeman and UEC as actual competitors. In addition, for each person identified, state the reasons given, if any, why such person so advised.

(d) Has, by reason of the challenged acquisitions of UEC stock, been deprived of potential competition between Freeman and UEC.

(e) Will, by reason of the challenged acquisitions of UEC stock, be deprived of potential competition between Freeman and UEC.

(f) Does not consider Freeman and UEC as potential competitors. In addition, for each person identified, state the reasons given, if any, why such person so advised.

Answer: The plaintiff has no information at this time in response to Interrogatory 23(a)-(f).

Interrogatory 26

With reference to Paragraph 23(c) of the Complaint, does plaintiff contend that as a result of the challenged acquisitions of UEC stock there has been an increase in concentration in the production and sale of bituminous coal among companies other than defendants? If so, describe the nature and extent of such increased concentration, identify the companies involved, and the manner by which the challenged acquisitions of UEC stock increased such concentration. In addition, identify the data upon which plaintiff relies in supporting its answer.

Answer: The plaintiff has at present no information in response to Interrogatory 26.

Interrogatory 27

With reference to Paragraph 23(c) of the Complaint, does plaintiff contend that the challenged acquisitions of UEC stock may increase concentration in the production and sale of bituminous coal beyond the increase in concentration, if any, which would occur if UEC and Freeman were one company? If so, state the facts and identify the data upon which plaintiff relies in supporting such contention.

Answer: The plaintiff has at present no information in response to Interrogatory 27.

Interrogatory 30

With respect to the allegation in Paragraph 19 of the Complaint that "the bituminous coal industry is highly concentrated among the leading producers due in large part to mergers" describe what other causes there have been for the alleged degree of concentration.

Answer: The plaintiff has at present no information in response to Interrogatory 30.

Interrogatory 37

Does plaintiff contend in this action that the election to the Board of Directors of UEC on October 30, 1959, of representatives of Material Service Corporation and Freeman Coal Mining Corporation had any effect upon competition in any "line of commerce" in any "section of the country" (within the meaning of Section 7 of the Clayton Act)?

(a) If so, state the manner, nature and extent of such effect on competition.

(b) If so, state the name, address, firm and position of each person (other than employees of plaintiff) known by plaintiff to be in possession of evidence or information concerning the matters set forth in plaintiff's answer to Interrogatory 37(a).

Answer: The plaintiff does not know the answer to this Interrogatory at this time.

Interrogatory 44

Does plaintiff contend that UEC can, at the present time, purchase additional coal reserves (other than abutting or fill-in acreage) recoverable through strip mining

operations within those reserves identified in response to Interrogatory 42? If so, state their location by County and State and, for each field of reserves by County, state:

(a) Their exact location.

(b) The coal seam or seams involved and the amount (in tons) recoverable from each seam.

(c) The average overburden covering such reserves.

(d) The average seam thickness of such reserves.

(e) The average overburden to seam thickness ratio of such reserves.

(f) The average sulphur content (in percent) of such reserves.

(g) The average ash content (in percent) of such reserves.

(h) The average moisture content (in percent) of such reserves.

(i) The average BTU rating of such reserves.

(j) The party or parties from whom they can be acquired.

(k) The approximate cost (in dollars) of acquisition.

(l) Which, if any, present or potential customers of UEC could be served by such reserves.

(m) Which, if any, present or potential customers of Freeman could be served by such reserves.

Answer: The answer to Interrogatory 42, above, is herein fully incorporated.

Interrogatory 45

Since, 1959, has any coal producer in Illinois, Indiana or Kentucky acquired or gained control of a new field of coal reserves mineable by stripping operations and exceeding

10,000,000 tons when assembled, excluding reserves so obtained by way of merger or combination with another coal producer? If so, for each such field of reserves state:

(a) The name of the producer involved.

(b) The date of such acquisition or control.

(c) The exact location of such reserves and the amount (in tons) of coal recoverable.

Answer: The plaintiff does not know the answer to this Interrogatory at this time.

Interrogatory 46

Does plaintiff contend that UEC can mine its Industry Field strip reserves in Illinois and competitively market the coal produced? If so, state:

(a) The approximate time by which such mining could be undertaken.

(b) Which, if any, present or potential customers of UEC could be served by such coal.

(c) Which, if any, present or potential customers of Freeman could be served by such coal.

Answer: The plaintiff does not know the answer to this Interrogatory at this time.

Interrogatory 50

Does plaintiff contend that UEC's competitive viability can be determined without reference to:

(a) The amount of coal reserves presently owned or controlled by UEC.

(b) The amount of coal reserves already committed to existing coal supply contracts.

(c) The geographic location of the coal reserves presently owned or controlled by UEC.

(d) The average sulphur content of such reserves.

(e) The average ash content of such reserves.

(f) The average moisture content of such reserves.

(g) The average BTU rating of such reserves.

(h) The nature of coal supply contracts required by utilities -- including both the length of the contracts and the annual coal requirements of such contracts.

(i) Whether or not UEC is able to compete for said coal supply contracts or utilities.

(j) The annual production capacity of UEC's present mines.

(k) Present and future air pollution legislation.

(l) Nuclear energy as an alternative energy source to coal.

(m) Other alternative energy sources to coal.

Answer: The plaintiff does not know the answers to Interrogatory 50(a)-(m) at this time.

Interrogatory 51

With respect to each utility presently purchasing coal produced in Illinois, state the amount (in tons) of uncommitted reserves which a coal producer must own or control and the total tons of coal which a coal producer must be able to produce annually in order to compete for the coal supply contracts of such utility.

Answer: The plaintiff does not know the answer to this Interrogatory at this time.

Interrogatory 54

Identify each coal producer known to plaintiff to have, without merger or combination with another coal producer with underground mining experience, undertaken underground mining operations within the last 40 years despite the fact that, prior thereto, such coal producer had not engaged in underground mining operations, and for each such producer, state:

(a) The date of undertaking such underground mining operations.

(b) The location of such underground mining operations.

Answer: The plaintiff does not know the answer to this Interrogatory at this time.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	CIVIL ACTION
v.	)	
	)	NO. 67 C 1632
GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION,	)	
	)	
Defendants.	)	

PLAINTIFF'S AMENDED ANSWERS TO INTERROGATORIES OF THE DEFENDANTS

Interrogatory 20

With reference to Paragraph 20 of the Complaint, state the date after which plaintiff contends UEC and Freeman were no longer "direct and substantial competitors in the sale of bituminous coal" and state the facts and identify the data upon which plaintiff relies in supporting its contention.

Answer: In addition to the plaintiff's answer to Interrogatory 20 as set forth in the Answers to Interrogatories of the Defendants, which was served and filed on March 15, 1968, the plaintiff states that Freeman Coal Mining Corporation ("Freeman") and The United Electric Coal Companies ("UEC"), if separately owned, would be actual and potential competitors based on the following facts:

(1) Each produces bituminous coal in the same geographic areas;

(2) Each advertises its coal for sale to the same type of customers, which customers are located in the same geographic areas in which Freeman and UEC produce and sell coal;

(3) Each negotiates and bids for some of the same sales of coal;

(4) Each sells to industrial and to utility customers which are located in the same geographic areas;

(5) Each sells its coal to many of the same customers;

(6) Each uses many of the same shipping routes for the shipment of the coal it produces and sells.

The data in support of the foregoing statements are as follows:

(1) Keystone Coal Buyers Manual 1967 (McGraw-Hill, Inc., New York, N.Y.) has, at page 417, a full page advertisement of UEC, a copy of which is attached. This advertisement states, in part, that "UNITED ELECTRIC COALS for ELECTRIC UTILITIES and BASIC INDUSTRIES" are available "BY BARGE on the Inland Waterways,"

"BY LAKE VESSEL to Great Lakes Ports," "BY RAIL to all Middle West Points" and "BY TRUCK for Local Area Delivery."

(2) Keystone Coal Buyers Manual 1967 has, at page 423, a full page advertisement of Freeman, a copy of which is attached. This advertisement states, in part, that Freeman Coal is "distinguished for their basic character and excellent preparation for electric utility, industrial, metallurgical and heating uses."

(3) Keystone Coal Buyers Manual 1967 has, at page 49, a full page advertisement of Freeman, a copy of which is attached. This advertisement states, in part, that "For generating electricity . . . There's a Freeman coal that's exactly right for the job."

(4) The above three advertisements in the Keystone Coal Buyers Manual 1967 are also set out in the Keystone Coal Buyers Manual 1966 at pages 439, 431, and 67.

(5) Keystone Coal Buyers Manual 1967, at pages 418 and 420. These pages show, inter alia, that the Fidelity Mine of UEC ships coal on the Illinois Central and on the Missouri Pacific Railroads, while the Orient No. 3 Mine

of Freeman ships coal on Missouri Pacific, Illinois Central and Chicago Burlington & Quincy Railroads.

We note that the shipping point for the Fidelity Mine is Pinckneyville, Illinois, while the shipping point for the Orient No. 3 Mine is the Mine. The Illinois State Geological Survey map entitled "SHIPPING COAL MINES IN ILLINOIS," which is dated January 1, 1966, shows that the Orient No. 3 Mine is less than one mile from the Missouri Pacific rail line and that at this point the Orient No. 3 Mine is about 20 miles from Pinckneyville, the shipping point for UEC's Fidelity Mine on the same rail line of the Missouri Pacific.

Keystone Coal Buyers Manual 1967 also shows, at page 418, that Freeman's Orient No. 4 Mine and Orient No. 5 Mine also ship on, among others, the Missouri Pacific and the Illinois Central Railroads.

(6) Letter from Illinois Power Company dated October 17, 1966. This letter has an attachment showing, among other things, that in 1964 Freeman and UEC both supplied coal (and, hopefully, in competition) to the Illinois Power Co. plants located in Vermilion and Wood River, and that in

1965 Freeman and UEC both supplied coal to the Illinois Power Co. plant at Vermilion. Furthermore, this letter from Illinois Power Co. states, in pertinent part, that:

> Both United Electric Coal Companies and Freeman Coal Mining Corporation have bid on supplying coal to our company. Other area coal suppliers also having bid for these requirements has satisfied us that the two named companies you have questioned have in fact held themselves out to be competitors.

(7) A Dun & Bradstreet "Analytical Report" on UEC dated June 8, 1966 states, at page 6, that UEC's sales "are made through the company's own sales organization largely to the utilities and heavy industries" and that UEC's "territory" is "Chicago, St. Louis and other industrial sections within easy shipping distance of the mines" and that "sales offices are maintained at St. Louis, Missouri and Peoria, Illinois, [and] also various other sales offices and distribution or service points [are maintained] at other locations."

A Dun & Bradstreet "Analytical Report" on Freeman dated November 11, 1966, states that Freeman's territory

is "largely the middle western states" and that Freeman's "sales offices are maintained in St. Louis, Missouri and Springfield, Illinois."

Freeman and UEC also both maintained separate sales offices in Chicago, Illinois.

(8) Letter from Central Illinois Public Service Company dated October 28, 1966. This letter states, inter alia, that:

> For many years it has been our practice to negotiate on an individual basis the terms of our coal purchases from our several coal suppliers. Several factors are considered in our coal purchasing decisions. Among these factors are: type of product (dust, screenings, carbon, etc.), BTU content, cost per million BTU (F.O.B. generating plant), sulfur and other impurities content, moisture content, amount of resulting ash, etc. Based upon the application of such factors, our coal purchases from Freeman Coal Mining Corporation and The United Electric Coal Companies have resulted in these two companies being among the principal suppliers of coal to two of our four electric generating stations (no coal is purchased from either company for use at our other two generating stations). In 1964 Freeman provided 24.8 percent and United Electric 2.9 percent of the total coal requirements at one of the generating stations, while at the other generating station the amounts were 12.3 percent and 23.8 percent, respectively. Similarly, in 1965 the relationships were 22.2 percent for Freeman and 3.0 percent for United Electric at the first station and 12.1 percent and 26.5 percent, respectively, for the second station. All factors considered, we have found the two companies to be competitive.

(9) Both Freeman and UEC own a substantial portion of Rail-To-Water Transfer Corporation, a firm which is engaged in the transfer of coal from railroad cars to vessels transporting coal on Lake Michigan.

The gradual acquisition of all of UEC's stock by the owners of Freeman commencing in 1955 and completed about December of 1966, or shortly thereafter, eliminated both actual and potential competition between Freeman and UEC. Plaintiff does not know the date within the period of gradual acquisition of UEC stock when Freeman and UEC were no longer direct and substantial competitors in the sale of coal.

Interrogatory 21

With reference to Paragraph 20 of the Complaint, does plaintiff contend that all of the approximately 53% of Freeman's dollar sales and the approximately 61% of UEC's dollar sales which are alleged to have been to the same customers in 1965 were sales that were made, or could have been made, in competition with each other?

(a) If plaintiff does not so contend, identify, by name and location of customer, location of receiving plants and tonnage involved, which of such sales were made, or could have been made, in competition with each other.

(b) If plaintiff does not so contend, identify, by name and location of customer, location of receiving plants and tonnage involved, which of such sales were not made, or could not have been made, in competition with each other.

(c) State the facts and identify the data upon which plaintiff relies in supporting its answers to Interrogatory 21, and, if answered, Interrogatories 21(a) and 21(b).

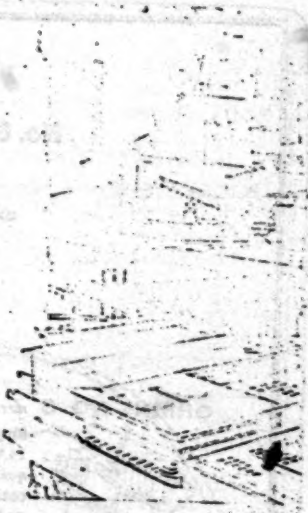
Answer: Plaintiff contends that Freeman and UEC, if separately owned in 1965, could have competed with each other in substantial sales to the same customers. Plaintiff does not know of any specific sales to any specific customers which were made in 1965 which could not have been made by Freeman and UEC in competition with each other.

BY BARGE on the Inland Waterways

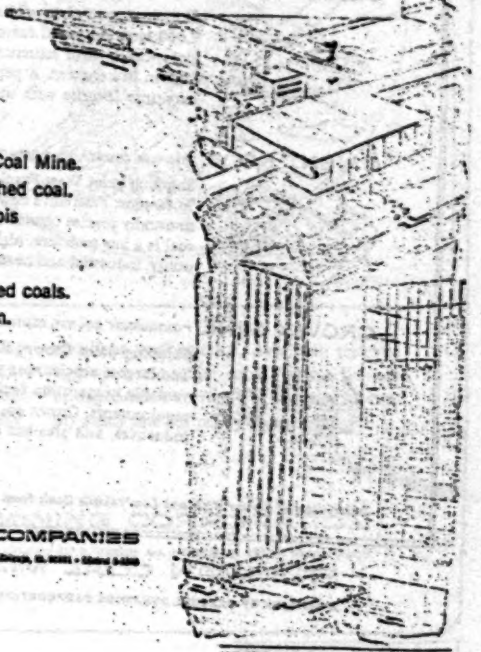
BY LAKE VESSEL to Great Lakes Ports

BY RAIL to all Middle West Points

BY TRUCK for Local Area Delivery



UNITED ELECTRIC COALS for ELECTRIC UTILITIES and BASIC INDUSTRIES



BANNER – Direct Barge-Loading Coal Mine.
Premium quality heavy media washed coal.
Bannar Seam, Peoria County, Illinois

CUBA-BUCKHEART
Heavy media, washed and heat dried coals.
Fulton County, Illinois, No. 5 Seam.

FIDELITY
Washed and heat dried coals.
Perry County, Illinois, No. 6 Seam.

THE UNITED ELECTRIC COAL COMPANIES
A SUBSIDIARY OF GENERAL DYNAMICS CORPORATION/[illegible]

Deep Mined Coals from No. 6 Seam in Southern and Central Illinois

distinguished for their basic character and excellent preparation for electric utility, industrial, metallurgical and heating uses

ORIENT NO. 3
JEFFERSON COUNTY, SOUTHERN ILLINOIS

Shipping point Orient Mine No. 3, Illinois. Daily capacity 14,000 tons. One of the largest mines in the country. Famed for quality and excellence of preparation. The lowest ash low sulphur coal in Illinois for metallurgical, electric utility, industrial and heating applications. Extensive reserves.

ORIENT NO. 4
WILLIAMSON COUNTY, SOUTHERN ILLINOIS

Shipping point Orient Mine No. 4, Illinois. Daily capacity 7,000 tons. A special feature of this mine is its attractive glossy-black, firm structure coal, unusually low in moisture and high in Btu content. A popular dealer coal as well as a long-time favorite with utilities and industries.

ORIENT NO. 5
FRANKLIN COUNTY, SOUTHERN ILLINOIS

Shipping point West Frankfort, Illinois. Daily capacity 7,000 tons. Freeman's newest mine, highly automated for unusually precise control of both quality and sizing. Orient No. 5 coal is a low moisture, high Btu product, highly desirable for utility, industrial and heating uses.

CROWN MINE
MONTGOMERY COUNTY, CENTRAL ILLINOIS

Shipping point Crown, Illinois. Daily capacity 10,000 tons. The largest air-cleaning plant in the country plus unusually versatile preparation facilities capable of meeting varied market requirements. Crown coal is widely used by utilities and industries, and also has a large and loyal dealer following.

Distributors of Choice High and Low Volatile Coals from Eastern Kentucky and West Virginia

FREEMAN COAL MINING CORPORATION

A DIVISION OF GENERAL DYNAMICS CORPORATION / 327 S. Michigan Ave. • Chicago, Ill. 60601 • ANdover 3-2800

If you are generating electricity, or doing any industrial power or heating job with coal, use a product of the Freeman mines in Illinois . . . for quality and consistently excellent performance. Available reserves aggregate one billion tons. You can be sure of dependable service and security of supply today and for many years to come.

FREEMAN COAL MINING CORPORATION

A DIVISION OF GENERAL DYNAMICS CORPORATION / 327 S. Michigan Ave. • Chicago, Ill. 60601 • ARdmore 3-2323

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff, v. GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, Defendants.	)	CIVIL ACTION NO. 67 C 1632

PLAINTIFF'S FIRST SUPPLEMENTAL ANSWERS TO INTERROGATORIES OF THE DEFENDANTS

Interrogatory 7

With reference to Paragraph 8 of the Complaint, for each "section of the country" designated by plaintiff as "appropriate" in answer to Interrogatories 4 through 6, state which, if any, of the following fuels plaintiff contends do not compete with bituminous coal in such "section of the country" in "providing a dependable and low cost source of energy," and state the facts and identify the data upon which plaintiff relies in supporting such contention:

(a) Gas
(b) Oil
(c) Nuclear energy
(d) Lignite
(e) Water

Answer: None of the above fuels compete substantially with bituminous coal in the sections of the country which are appropriate to this lawsuit as set out in the answers to Interrogatories 4-6. In answer to this Interrogatory plaintiff relies on Kurtz

deposition exhibits 1-8, 9 (at pages 86-90) and 10 (at pages 73-77) and the following deposition testimony together with the exhibits marked therein: deposition testimony of Thomas J. Tarzy at pages 16-18, 315-317, 319, 320-327; deposition testimony of Joseph J. Gallagher (no transcript pages available); deposition testimony of Nicholas J. Camicia at pages 100-102; deposition testimony of John M. Morris at pages 297-299 (and Morris deposition exhibit 70); and deposition testimony of Frank F. Kolbe at page 85 and pages 164-166.

Interrogatory 8

Does plaintiff contend that the "Eastern Interior Coal Province sales area" is an area anywhere within which coal mined at any location in the Eastern Interior Coal Province is able to compete with coal mined at any other location in the Eastern Interior Coal Province?

(a) If so, state the facts and identify the data upon which plaintiff relies in supporting this contention.

Answer: Coal mined anywhere in the Midwest Coal Field (Eastern Interior Coal Province) is in competition, direct or indirect, with all other coal mined in said area, for sales in the Eastern Interior Coal Province sales area as defined in the Complaint. The answers to Interrogatories 3(c) and 19 are herein fully incorporated. In further support of this answer the

Government relies on the deposition testimony of Charles W. Stadell at pages 35-36 of December 16, 1968 (no transcript pages available) and the deposition testimony of Nicholas J. Camicia at pages 77-78 and pages 107-133.

Interrogatory 13

Identify the twenty largest (in terms of total tons produced from mines within Illinois) coal producers operating mines within the State of Illinois in 1967 and, for each, state total nationwide production, production from mines within the Eastern Interior Coal Province, and production from mines within the State of Illinois, all for the year 1967.

Answer:

Name	Nationwide Production	Eastern Int. Coal Province Production [1]	State of Illinois Production [2]
1. Peabody Coal Co. (including Midland Electric Coal Corp., Forsythe Energy Coal Co. and Stonefort Coal Mining Co., Inc.)	NA	42,546,199	20,158,284 [3]
2. Freeman Coal Mining Corp. (Subsidiary of General Dynamics)	NA	8,380,496	8,380,496
3. Southwestern Illinois Coal Corp.	NA	7,526,586	7,526,586
4. Truax-Traer Coal Co. (Subsidiary of Consolidated Coal Co.)	NA	6,906,344	6,906,346 [4]
5. Old Ben Coal Corp.	NA	9,457,647	5,989,539
6. The United Electric Coal Companies	NA	5,743,098	5,743,291 [5]

1/ Source: "Report of Mine Performance . . . January through December 1966 and 1967 for Illinois, Indiana, and West Kentucky, by Districts" published by Mid-West Coal Producers Institute, Inc. (Terleke deposition exhibit 11).

2/ Source: Coal Report of Illinois, 1967, Department of Mines and Minerals, State of Illinois, Table 10 (Kolbe deposition exhibit 19).

3/ Mid-West Institute figure is 15,832 tons more.

4/ Mid-West Institute figure is 2 tons less.

5/ Mid-West Institute figure is 193 tons less.

	Name	Nationwide Production	Eastern Inc. 1/ Coal Province Production	State of Illinois 2/ Production
7.	Zeigler Coal & Coke Co. (including subsidiaries)	NA	3,940,921	2,898,399 6/
8.	Sahara Coal Co., Inc.	NA	2,823,526	2,550,307 7/
9.	Ayrshire Collieries Corp.	NA	8,604,021	2,367,983
10.	Main Line Coal Corp.	NA	NA	587,784
11.	Little Dog Coal Co.	NA	NA	416,049
12.	Blue Bird Coal Co.	NA	NA	182,970
13.	Ajax Coal Co., Inc.	NA	NA	158,324
14.	Tab Mining Co., Inc.	NA	NA	135,536
15.	Sherwood-Templeton Coal Companies (Pioneer)	NA	117,507	117,735 8/
16.	Barbara Kay Coal Co., Inc.	NA	NA	111,741
17.	Belle Valley Coal Co., Inc.	NA	NA	107,090
18.	Jo Lon Mining Co.	NA	NA	88,371
19.	Harrisburg Coal Co.	NA	NA	75,589
20.	Parton Coal Co.	NA	NA	65,545

6/ Mid-West Institute figure is 1 ton more.

7/ Mid-West Institute figure is 273,019 tons more.

8/ Mid-West Institute figure is 228 tons less.

Interrogatory 14

With reference to Paragraph 19 of the Complaint, identify all coal producers referred to in the answers to Interrogatories 9 through 13, which plaintiff contends are "leading" producers and state the facts upon which plaintiff relies in supporting each such contention.

Answer: The answer to Interrogatory 13 is herein fully incorporated. In support of this contention the plaintiff relies on its answers to Interrogatories 3(c), 8 and 19.

Interrogatory 15

With reference to Paragraph 19 of the Complaint, identify all coal producers referred to in the answers to Interrogatories 9 through 13, which plaintiff contends are not "leading " producers and state the facts upon which plaintiff relies in supporting each such contention.

Answer: The only producers which plaintiff contends are not leading producers as set out at answers to Interrogatories 9 through 13 are those which are no longer producing coal. The plaintiff herein fully incorporates its answer to Interrogatory

Interrogatory 20

With reference to Paragraph 20 of the Complaint, state the date after which plaintiff contends UEC and Freeman were no longer "direct and substantial competitors in the sale of bituminous coal" and state the facts and identify the data upon which plaintiff relies in supporting its contention.

Answer: The plaintiff does not know the answer to this Interrogatory. Competition between UEC and Freeman gradually lessened as General Dynamics increased its stock ownership in UEC.

Interrogatory 21

With reference to Paragraph 20 of the Complaint, does plaintiff contend that all of the approximately 53% of Freeman's dollar sales and the approximately 61% of UEC's dollar sales which are alleged to have been to the same customers in 1965 were sales that were made, or could have been made, in competition with each other?

(a) If plaintiff does not so contend, identify, by name and location of customer, location of receiving plants and tonnage involved, which of such sales were made, or could have been made, in competition with each other.

(b) If plaintiff does not so contend, identify, by name and location of customer, location of receiving plants and tonnage involved, which of such sales were not made, or could not have been made, in competition with each other.

(c) State the facts and identify the data upon which plaintiff relies in supporting its answers to Interrogatory 21, and, if answered, Interrogatories 21(a) and 21(b).

Answer: The plaintiff does contend that all of the sales of Freeman and all of the sales of UEC in 1965 could have been made in competition with each other, with the exception of Freeman's sales of metallurgical coal. In support of this fact, the plaintiff relies on the testimony of the United Electric's present and former officers as set out in our answer to Interrogatory 19. The plaintiff also points out that Frank Hugent testified that

(at page 361):

> A The competitors of the Freeman Coal Mining Corporation on southern Illinois coal are those producers in southern Illinois, western Kentucky and Indiana, and to a degree producers in the Belleville District.
>
> Competitors of Freeman in central Illinois are producers in central Illinois and Fulton County, and to a limited extent coals from other fields that can reach Edison's market.

Furthermore, Frank F. Kolbe testified that UEC and Freeman were competitors (at pages 164-166).

Charles W. Stadell also testified on December 16, 1968, that coal mined in all of the freight rate districts in Mining Districts 9, 10 and 11 have shipped and could ship coal into the Chicago metropolitan area, (transcript reference page not available) at pages 35-36.

See also Morris deposition testimony, at pages 299-304. See also answers to Interrogatories 19-20, 22-24.

Interrogatory 27

> With reference to Paragraph 23(c) of the Complaint, does plaintiff contend that the challenged acquisitions of UEC stock may increase concentration in the production and sale of bituminous coal beyond the increase in concentration, if any, which would occur if UEC and Freeman were one company? If so, state the facts and identify the data upon which plaintiff relies in supporting such contention.

Answer: It may be inferred that if the Freeman-UEC combination is not dissolved, other such illegal mergers may be attempted.

Interrogatory 44

Does plaintiff contend that UEC can, at the present time, purchase additional coal reserves (other than abutting or fill-in acreage) recoverable through strip mining operations within those reserves identified in response to Interrogatory 42? If so, state their location by County and State and, for each field of reserves by County, state:

(a) Their exact location.

(b) The coal seam or seams involved and the amount (in tons) recoverable from each seam.

(c) The average overburden covering such reserves.

(d) The average seam thickness of such reserves.

(e) The average overburden to seam thickness ratio of such reserves.

(f) The average sulphur content (in percent) of such reserves.

(g) The average ash content (in percent) of such reserves.

(h) The average moisture content (in percent) of such reserves.

(i) The average BTU rating of such reserves.

(j) The party or parties from whom they can be acquired.

(k) The approximate cost (in dollars) of acquisition.

(l) Which, if any, present or potential customers of UEC could be served by such reserves.

(m) Which, if any, present or potential customers of Freeman could be served by such reserves.

Answer: Yes. The location of these coal reserves are as follows:

1. Augusta Field, located approximately ten miles west of the Industry Field, contains approximately 10 million tons of coal. Source: Inman deposition pages 53, 55 and 161.

2. Meredosia - Mount Sterling area, located in Brown County, Illinois, contains 30 million tons between 100 and 150 feet of overburden and five million tons beneath less than 100 feet of overburden. Source: Inman deposition pages 59-60.

3. Tazewell County, Spring Lake Township area, located directly south of the Banner Mine across the Illinois River, contains 5,000,000 tons of coal. Source: Inman deposition pages 60, 61 and 161.

4. Salt Fork Field, located near Catlin, Illinois, four miles from the Mary Moore Mine, contains 35,000,000 tons beneath overburden ranging from 60 to 150 feet and 150 feet to 200 feet deep. Source: Inman deposition pages 63-70.

5. Fidelity Mine contains 5,000,000 tons of coal classified as deep coal but which possibly may be stripped. The coal is six

feet thick and is beneath overburden ranging from 80 feet to 125 feet deep. Source: Inman deposition pages 112, 114 and 115.

6. Industry Field contains an additional one to two million tons which UEC could acquire. Source: Inman deposition page 162.

7. There may be additional reserves at UEC's present mines which reserves are unknown to UEC at the present time. For example, Mary Moore was operated longer than anticipated. Source: Inman deposition page 72 (substantiated by the deposition testimony of John M. Morris at pages 38-58 and Frank F. Kolbe at pages 230-231).

8. Due south of the Industry Field, toward the town of Bushville, Illinois, there are coal reserves. Source: Inman deposition page 186.

In addition to the foregoing, plaintiff contends that there is a probability UEC may be able to acquire additional coal reserves (other than those abutting present reserves and "fill-in" acerage) recoverable through strip mining operations. In support of this contention, and of areas 1 through 8 above, the plaintiff also relies on the deposition testimony of Burl Jensen at the following pages (together with the exhibits identified and/or discussed therein): 118-137, 171-178, 183-215, 216-226, 258-268 and 271 and the deposition testimony of Thomas H. Latimer at the

following pages (together with the exhibits identified and/or discussed therein): 71-82, 84-87, 92-96, 412-413, 101-106, 108-117, 129-133, 137-140, 140-141, 141-147, 147-153, 153-155, 159-167, 178-186, 190-193, 223-295, 205-213, 295-310, 311-319, 319-326, 326-328, 324-350, 354-356, 366-369, 350-354, 358-366, 370-373, 373-375. In further support of the above see Morris deposition exhibit 12.

Interrogatory 46

Does plaintiff contend that UEC can mine its Industry Field strip reserves in Illinois and competitively market the coal produced? If so, state:

(a) The approximate time by which such mining could be undertaken.

(b) Which, if any, present or potential customers of UEC could be served by such coal.

(c) Which, if any, present or potential customers of Freeman could be served by such coal.

Answer: The plaintiff contends that the Industry Field can be mined at a profit by a competent and unfettered management. The plaintiff does not know at what time this could take place but Robert H. Inman, former Vice President - Operations of UEC, testified that the Industry Field possibly may be mined after the Fulton County reserves of United Electric are exhausted.

Source: Inman deposition at page 162.

In further support of the profitable minability of the Industry Field the plaintiff relies on the deposition testimony of Frank F. Kolbe, former President of UEC and Chairman of the UEC Board of Directors at pages 208-230, 253-259, 268-271, 772-800, 807-813, 813-818.

In further support of the profitable minability of the Industry Field the plaintiff relies on the deposition testimony of John M. Morris, the former President of UEC, at pages 144-187 (and Morris deposition exhibits 21-31) and the testimony of Thomas J. Latimer, Land Manager of UEC, at pages 427-428, 354-356, 366-369 and 459-462 (and Latimer deposition exhibit 47).

Interrogatory 54

Identify each coal producer known to plaintiff to have, without merger or combination with another coal producer with underground mining experience, undertaken underground mining operations within the last 40 years despite the fact that, prior thereto, such coal producer had not engaged in underground mining operations, and for each such producer, state:

(a) The date of undertaking such underground mining operations.

(b) The location of such underground mining operations.

Answer: The plaintiff believes that Ayrshire Collieries Corp., Indianapolis, Indiana, is at least one strip coal producer which has undertaken underground mining without merger or combination with another coal producer. This mine is known as the Thunderbird Mine and it is located in the Linton Freight Rate District in Indiana. See deposition testimony of Frank F. Kolbe at pages 139-140 and Terleke deposition exhibit 11.

DEPARTMENT OF JUSTICE
Room 2536 United States Courthouse
Chicago, Illinois 60604

DEPOSITION EXHIBIT 47

60-0-37-920

May 29, 1969

Reuben L. Hedlund, Esq.
Kirkland, Ellis, Hodson,
Chaffetz & Masters
Prudential Plaza
Chicago, Illinois 60601

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Illinois)

Dear Mr. Hedlund:

This letter is in reply to your letter to us of January 24, 1969, reporting on our conference of January 17, 1969 when we discussed plaintiff's answers to the defendants' interrogatories. The numbering below corresponds to the numbering of the defendants' interrogatories. We have considered your questions and requests and the following are our comments and responses:

1(l). The "industrial customers" of Freeman referred to in paragraph 14 of the complaint was based on computations made from the statement setting forth the names and addresses of the twenty-five largest customers of Freeman for the year 1965, together with the total dollar amounts and tonnages of coal sold to each of these customers during 1965, which material was sent to us by Benjamin Z. Gould, Esq., then counsel for General Dynamics, by letter dated November 11, 1966.

1(n). Our answer to this interrogatory is revised to substitute the word "means" for the words "refers to the fact."

1(q). We believe that our answer to this interrogatory is clear and adequate.

2(b). This phrase is, we believe, clear and adequate and refers to the allegation in paragraph 16 of our complaint that in 1965 the combination of GD and UEC ranked as the second largest seller of bituminous coal in Illinois regardless of the States in which coal sold in Illinois was mined by any seller.

2(c). We believe that our answer to this interrogatory is clear and adequate and refers to the allegation in paragraph 18 of our complaint that in 1965 the combination of GD and USC ranked as the second largest seller of bituminous coal in the Eastern Interior Coal Province sales area regardless of the States in which coal sold in such area was mined by any seller.

3(c). In essence, D. W. Buchanan, Jr., Charles W. Stedell, Elmer C. Hill, Warren F. Wurzburg, Harry Eggert and the unidentified geologist from Paul Weir & Company stated that the Eastern Interior Coal Province sales area is recognized in the industry as the principal area where Eastern Interior Coal Province coal is sold.

3(f). We believe that the allegation in paragraph 9 of our complaint that "the United States now has between 830 billion and 2,000 billion tons of coal reserves which can be recovered" is a "conservative allegation," as stated in our answer to this interrogatory, because it refers to coal reserves now known or estimated by the U.S. Geological Survey and does not refer to coal reserves which have not become known or have been estimated.

3(k). We believe that this answer is correct. We estimated the 1967 Illinois coal production and obtained the coal production in Illinois from 1950 through and including 1966 from various editions of the Illinois Coal Report.

3(l). We do not know the data upon which Jack A. Simon relied in making the statements set forth in this answer. However, we note that Gallagher deposition exhibit 1, which is the Bureau of Mines report entitled "Bituminous Coal and Lignite Distribution Calendar Year 1965" states, at page 8, that in 1965 34,147,000 tons of the coal shipped to Illinois consumers were produced in Illinois and that total shipments to Illinois consumers amounted to 44,355,000 tons of coal.

3(r). In essence, Jack A. Simon told us that many mergers had occurred in the Midwest coal industry and that there are less companies operating in Illinois than formerly.

7. We believe that our answer to this interrogatory is clear and adequate and the word "substantially" is not deleted.

8(a). Our answer to this interrogatory is revised to substitute the words "actually or potentially" for the words "direct or indirect" and to add the word yes to the beginning of our answer.

14 & 15. The word "leading" used twice in paragraph 19 of our complaint is meant to be synonymous with the word "largest." The largest producers as referred to in this paragraph are set out in our answers to Interrogatory 13.

16. The information obtained by us from Southwestern Illinois Coal Corp. and Peabody and affiliates does not provide the information requested by Interrogatory 16. Southwestern's and Peabody's executives have requested that we not disclose this reserve information to defendants because to do so would create competitive harm.

19. The words "same customers" referred to in paragraph 20 of our complaint means a common customer and does not refer specifically to a facility or facilities of a customer.

20. Our position is that Freeman and UEC can no longer be actual or potential competitors because they are both owned by the same corporation, that is, by General Dynamics. They were substantial competitors when owned separately.

22(a). Our answer to this interrogatory is revised to substitute the words "and, probably, in various submarkets thereof" for the words "and in various other sections of the country."

22(b)-(e). We believe that our answers to these interrogatories are clear and adequate. The words "same customers" referred to in paragraph 20 of our complaint does not refer specifically to a facility or facilities of a customer.

24 & 25. We believe that our answers to these interrogatories are clear and adequate.

27. We believe that our answer to this interrogatory is clear and adequate.

28 & 29. Other than the allegations alleged in sub-paragraphs 23(a) through 23(c) of the complaint, General Dynamics' acquisition of UEC has been anticompetitive due to actual and potential reciprocity activities of the defendants. However, we will not adduce evidence on this subject at trial nor make it an issue in this case. In reference to vertical anticompetitive effects we await your answer to numbered paragraph 16 of our letter to you of May 23, 1969.

35, 38 & 39. We believe that our answers to these interrogatories are clear and adequate.

42 & 43. Western reserves are relevant only to the relief issues of this lawsuit.

46. We believe that our answers to this interrogatory are clear and adequate.

47. Our answer to this interrogatory is revised to include after the words "Freeman's Orient Mines" the words "and any Illinois and any Eastern Interior Coal Province sales area customers."

48. We believe that our answer to this interrogatory is clear and adequate.

This letter, and not your letter of January 24, 1969, contains our revisions to your interrogatories.

Sincerely yours,

RICHARD W. McLAREN
Assistant Attorney General

By John T. Cusack
John T. Cusack
Attorney, Midwest Office
Antitrust Division

DEFENDANT'S EXHIBIT 48

EXHIBIT "A"

CHICAGO, WILMINGTON & FRANKLIN COAL COMPANY

Chicago, Illinois

December 15, 1954

To the Stockholders of

CHICAGO, WILMINGTON & FRANKLIN COAL COMPANY:

The coal mining industry has run into a series of evolutionary changes which have caused a shrinkage in demand for its product and have brought severely competitive conditions. Dieselization of the railroads, great expansion of natural gas distribution, and recent unrestricted imports of foreign residual oil which undersells coal may be mentioned. While some economic students believe that it will not be many years before coal will again have to greatly increase its output, to meet metallurgical, electrical and other expanding needs, the consensus is that our industry currently is undergoing great changes and may have several more years of difficult adjustment.

Naturally our Company has studied possible ways of improving its position. We have been invited into several tentative proposals of consolidation, but in each case the net result to our stockholders would be largely that of an exchange of their stock in our company for some other coal mining security, with no guarantee of much, if any, improvement of the character of their investment. If, on the other hand, an opportunity should present itself to sell our stock outright, at a satisfactory price for cash, that might be something of great interest.

It happens that such a suggestion was made to me earlier this year which I have worked on and developed to a point where I could discuss it with our Board of Directors. Understandably, the other party to these discussions has not yet wished to be disclosed.

I have been able to work out tentatively a quite definite proposition and have our Board's approval to present it to you and add my personal endorsement.

A price of $25.00 per share is considered to be fair and mutually satisfactory for C.W.F. stock for such a trade as I have indicated. The tentative purchaser has expressed a desire to have the undersigned, and also several of our key men, available for a period. It is my belief that this wish has added considerably to the purchaser's willingness to buy. I do not expect that any compensation I may receive for future services will be more than I would reasonably expect to receive if no sale is made, and C.W.&F. continues to operate. It is distinctly understood that I am not to receive now or to be promised any re-investment opportunity for the proceeds of any of my family stock, all of which is to be sold at $25.00 per share under the plan. I will not make any profit or commission on the Options and Proxies running to me.

In our talks on this matter we have insisted upon an equal price and treatment for every participating stockholder, more specifically a price of $25.00 per share. And of course we have also required assurances that our employe personnel will be given a fair and sympathetic opportunity for continued employment.

It is to be emphasized that the trade is contingent upon prompt participation by at least 76% of the outstanding shares, and is also contingent upon an inspection of property and a verification of balance sheet items, which it is believed can be accomplished expeditiously and in time to permit deposit in the bank of the $25.00 per share by December 31, 1954 for all shares that are deposited with the bank without delay.

I have been the head of our Company for forty years and a very large percentage of our stock is owned by my personal friends, or their widows or heirs. My own family and the Webster family are the largest ownership blocks and, with the stock owned by Stonega and a few other similar holdings, constitute a majority of our shares. It seems to me that the character of such a large part of the ownership of our Company, together with the possible opportunity to receive a satisfactory cash

price, indicates the wisdom of accepting this chance to be taken out of what may be called a "business man's investment" in coal mining.

In order to assist in carrying out this transaction, an Option and Proxy running to me and a Transmittal Letter covering stock running to The First National Bank of Chicago as escrowee were prepared. Copies are being sent to you herewith. These documents expire January 20, 1955, if not exercised on or before that date. It has been possible for me to speak with a considerable number of my friends who have assured me of their approval. In order to pursue the opportunities I needed the definite agreement of a substantial majority of our stockholders. I proceeded accordingly and I now have the Options and Proxies of the owners of such substantial majority. I am now able to send this advice to all of our stockholders.

I sincerely hope that you will accept this opportunity and act promptly. If anything is not pleasantly understandable, I will consider it a privilege to answer questions, either in person or by phone. If these proposed transactions do not come to pass, we will go ahead, confidently, "as was".

In closing I think I should give you the following interim advice on the Company's business status:

Referring to my last letter to Stockholders, in our Annual Report for 1953 dated April 28th of this year:

The first quarter of 1954 showed improvement and the Company went into the early summer with a carefully worked out operating program that gave promise of continued betterment over last year. We had reduced the working force and daily output of Orient No. 1 to about 3500, from 5000 tons, making an important per ton saving in costs by concentrating production in a small remaining section with good mining conditions. This was to be and is the last year for No. 1. We had closed down Orient No. 2 for March and April, but had thought it wise to announce re-opening for May 2nd, for by which time our contracts for Orient coal and sales outlook indicated the need for this production additional to new No. 3 and reduced No. 1. However, we ran into

bad luck on several of our largest summer customers who were closed down or were forced to severely curtail planned coal consumption, unexpectedly for painful periods, which loss of tonnage together with extremely hot weather, with many quite unusual 100 degree days in our territory, gave us a difficult summer. Having to operate the older mines on broken time was unavoidably costly.

An as yet unaudited but reliable comparison of the first 11 months of this year (November, 1954 partly estimated) with those of last shows:

1st 11 months	1954	1953
Tons sold	3,011,775	3,028,735
Gross Coal Sales	$12,318,941	$13,227,713
Net Income	1,108,764	1,277,000
Depreciation & Depletion	499,418	353,497
Final Balance (after Federal Tax)	609,346	923,503

We now estimate that net results for 1954 probably will be about $2.00 per share.

For your further information please see the following comparative condensed balance sheets at October 31, 1954 and at December 31, 1953, in accordance with the books of the Company. The statement at October 31, 1954 is subject to possible year-end and audit adjustments; however, I believe that it is substantially correct.

I also refer you to our annual report for 1953 with auditors' more complete balance sheet and notes. I will be pleased to send any of this data on request. As stated I will consider it a privilege to answer questions by phone or in person.

In closing, let me state that I wholeheartedly endorse this proposal for my own and my family holdings. Likewise, officers and employes of the Company, with a considerable ownership, also favor the proposed transactions. As I have stated earlier, a majority of the stockholders have already evidenced their approval by depositing their

stock with the bank. May I again emphasize that in order to take advantage of this opportunity you should act promptly by signing and returning the Option and Proxy to me and sending your stock to the bank.

GEORGE B. HARRINGTON,
President.

ASSETS

	Oct. 31, 1954	Dec. 31, 1953
Current Assets	$ 3,102,551	$ 3,423,589
Investments	50,713	50,712
Fixed Assets (less Reserves for Depr. & Depl.)	17,915,475	17,405,490
Other Assets	13,506	47,982
	$21,082,245	$20,927,773

LIABILITIES

Current Liabilities	$ 1,965,197	$ 2,059,341
Long-Term Debt	2,727,900	2,558,975
Reserve for Workmen's Compensation	223,258	200,726
Reserves Other	180,865	100,000
Liability under Real Estate Sales Contracts	10,000	10,000
Capital Stock—No Par Value: (346,702 shares outstanding)	4,541,108	4,541,108
Capital Surplus	4,832,785	4,832,785
Earned Surplus	6,601,132	6,624,838
	$21,082,245	$20,927,773

ABBREVIATION KEY AND EXPLANATION SHEETS FOR DEFENDANTS' EXHIBIT NO.s 49-52 DX 49A

SUBPOENA QUESTIONNAIRE FORMS AND RELATED COURT ORDERS

PRODUCER & MINE

ABBREVIATION KEY

-------Abbreviation-------		-------Explanation-------	
Coal Co.	Mine	Coal Co.	Mine
AYRS	CHNK	Ayrshire	Chinook
AYRS	DLTA	"	Delta
AYRS	HARM	"	Harmattan
AYRS	MINN	"	Minnehaha
AYRS	SUNS	"	Sun Spot
AYRS	THUN	"	Thunderbird
AYRS	WRIT	"	Wright
BRKY	BRDY	Barbara Kay	Barbara Kay
BBMN	EBNY	B B Mining	Ebony
BBMN	NO2	"	Number 2
BLVY	BLVY	Belle Valley	Belle Valley
BL&Z	MRDK	Bell & Zoller	Murdock
BL&Z	ZGL4	"	Ziegler #4
BL&Z	ZGL9	"	Ziegler #9
BL&Z	ORIL	"	Oriole
BL&Z	SPRT	"	Spartan
BKTM	BKTM	Black Tam	Black Tam
BRGE	BRGE	Burge	Burge
TXTR	BST2	Truax Traer	Burning Star #2
TXTR	BST3	"	Burning Star #3
TXTR	FIAT	"	Fiatt Red Ember
TXTR	HILS	"	Hillsboro
DRKS	BOON	Dark Star	Boone

Coal Co.	Mine	Coal Co.	Mine
DCLA	DCLA	Decola	Decola
GBRL	GBRL	Gibraltar	Gibraltar
GREN	PNHR	Green	Panther
HRBG	HRBG	Harrisburg	Harrisburg
HSTN	HSTN	Houston	Houston
ISCK	EDIA	Island Creek	E. Diamond
ISCK	FIES	"	Fies
ISCK	CRES	"	Crescent
ISCK	UNTN	"	Uniontown
ISCK	ATKN	"	Atkinson
ISCK	WILS	"	Williams
ISCK	PLSV	"	Pleasant View
JOLR	JOLR	Jolor	Jolor
KIRK	CANY	Kirkpatrick	Caney Creek
WRIT	WRIT	Wright	Wright
MORS	HRTN	Morris Bros.	Horton
OLDB	BLKF	Old Ben	Blackfoot
OLDB	ENOS	"	Enos
OLDB	KING	"	Kings
OLDB	NO21	"	No. 21
OLDB	NO24	"	No. 24
OLDB	NO9	"	No. 09
PRTN	PRTN	Parton	Parton
PEAB	EAGL	Peabody	Eagle
PEAB	EDWD	"	Edwards
PEAB	MECO	"	Mecco
PEAB	MWST	"	Midwest
PEAB	NRTH	"	Northern
PEAB	RKNG	"	River King
PEAB	WSCR	"	Will Scarlet
PEAB	DYMO	"	Dynamo Mine #10
PEAB	UTIL	"	Utility Hiwall

Coal Co.	Mine	Coal Co.	Mine
PEAB	ALND	Peabody	Allendale
PEAB	BSTR	"	Bright Star
PEAB	MDLG	"	Middlegrove
PEAB	ENGY	"	Forsyth-Energy
PEAB	HMST	"	Homestead
PEAB	KEN	"	Ken
PEAB	RVQN	"	River Queen
PEAB	RIVW	"	Riverview
PEAB	SNCL	"	Sinclair
PEAB	VOGE	"	Vogue
PEAB	CHFT	"	Chieftan
PEAB	HWTH	"	Hawthorn
PEAB	LYNV	"	Lynnville
PEAB	OLGL	"	Old Glory
PEAB	VICT	"	Victoria
PTMY	COLO	Pittsburg & Midway	Colonial
PTMY	DEK6	"	DeKoven #6
PTMY	DEK9	"	DeKoven #9
PTMY	PARA	"	Paradise
PYRO	PYRO	Pyro	Pyro
RS&K	NO1	RS&K	Number 1
RIAL	JIFF	Rialto	Jiffy
RUSB	LTLJ	R. Badgett	Little Joe
SAHA	5 16	Sahara	No. 5 and No. 16
SAHA	NO6	"	No. 6
SHTP	PION	Sherwood-Templeton	Pioneer
SWIL	CAPT	Southwest Ill.	Captain
SWIL	STRL	"	Streamline
TABB	LKVW	Tab-Badgett	Lakeview
VDAY	VDAY	V-Day	V-Day
VEND	VEND	Venedy	Venedy
WEBT	DOTI	Webster County	Dotiki

Coal Co.	Mine	Coal Co.	Mine
WICR	SHRK	Weirs Creek	Shamrock
FREE	CRWN	Freeman	Crown
FREE	ORI3	"	Orient #3
FREE	ORI4	"	Orient #4
FREE	ORI5	"	Orient #5
UEC	BK17	United Electric	Buckheart
UEC	CUBA	"	Cuba
UEC	BR27	"	Banner
UEC	FIDL	"	Fidelity

COLUMN HEADING EXPLANATION

"Mine Characteristics"

The following is an explanation of the column headings as they appear in "PRODUCER DATA EXHIBITS, Mine Characteristics" in Set P-I, Reports A-D, DEFENDANTS' EXHIBIT NO. 49 :

1. Set P-I, Report A

Column:	Explanation:
COAL CO. -	(See Abbreviation Key)
MINE -	(See Abbreviation Key)
PRODUCING DISTRICT -	The Freight Rate District in which the given mine is located
TYPE -	Whether given mine is a strip, deep, or strip/deep mine
TONS -	The 1967 production at the given mine in thousands of tons
TRANSPORTATION USED -	The methods of transportation utilized in 1967 to transport coal from the given mine to consumers

2. Set P-I, Report B

Column:	Explanation:
COAL CO. -	(See Abbreviation Key)
MINE -	(See Abbreviation Key)

SEAM NO. - The seam mined at the particular mine in 1967. The digit which appears in the column is the same as the seam number mined, except that the code number "20" has been assigned to the Davis-DeKoven Seam and the code number "50" has been assigned to the Brazil Block Seam. In those cases where more than one seam was mined in 1967, a separate line for each seam is shown.

RATIO - The range within which the average overburden ratio at the given mine in 1967 is included

SEAM THCK - The thickness in inches of the seam mined in 1967

MAX OB (In feet) - The maximum overburden in feet at the mine in 1967

AVE OB (In feet) - The average overburden in feet at the mine in 1967

TOTAL TONS - The total 1967 production at the given mine in thousands of tons

PRODUCING DISTRICT - The Freight Rate District in which the given mine is located

3. Set P-I, Report C

Column: Explanation:

COAL CO. - (See Abbreviation Key)

MINE - (See Abbreviation Key)

PRODUCING DISTRICT - The Freight Rate District in which the given mine is located

DEPTH DEEP - The average depth of mining operations (in feet) for the year 1967

TONS - The total production at the given mine for 1967 in thousands of tons

4. Set P-I, Report D

This Report concerns mines employing both strip and deep mining methods in 1967.

See column explanations for Tables B-C.

COLUMN HEADING EXPLANATION

"Comparison of Leading Producers With Other Producers: Mine Size and Characteristics"

The following is an explanation of the column headings which appear in "PRODUCER DATA EXHIBITS, Comparison of Leading Producers With Other Producers: Mine Size and Characteristics" in Set P-I, Reports F_1, F_2 and G_2, DEFENDANTS' EXHIBIT NO. 50 :

In Report F_1, the mine characteristics of all mines of "leading coal producers" are set forth in alphabetical order by producer; in Report F2, the mine characteristics of all mines of "other coal producers" are set forth in the same manner.

1. Set P-I, Reports F_1 and F_2

Column:	Explanation:
COAL CO. -	(See Abbreviation Key)
MINE -	(See Abbreviation Key)
SEAM NO. -	The seam mined at the particular mine in 1967. The digit which appears in the column is the same as the seam number mined, except that the code number "20" has been assigned to the Davis-DeKoven Seam and the code number "50" has been assigned to the Brazil Block Seam. In those cases where more than one seam was mined in 1967, a separate line for each seam is shown.

TYPE - The average seam thickness (in inches) mined in 1967 at the particular mine

DEPTH DEEP - For deep mines, the average depth (in feet) of mining operations in 1967

MAX OB - For strip mines, the maximum overburden (in feet) for mining operations in 1967

AVE OB - For strip mines, the average overburden (in feet) for mining operations in 1967

RATIO - For strip mines, the overburden ratio for 1967 mining operations at the particular mine; the code numbers which appear hereunder are explained as follows:

Code "1" = an overburden ratio of less than 15:1
Code "2" = an overburden ratio from 15:1 through 19:1
Code "3" = an overburden ratio from 20:1 through 24:1
Code "4" = an overburden ratio from 25:1 through 29:1
Code "5" = an overburden ratio of 30:1 or more

W&S - An "X" in this column indicates that the particular mine has a washer and sizer facility; a BLANK in this column indicates the absence of such a facility at the particular mine

DRY - An "X" in this column indicates that the particular mine has a dryer facility; a BLANK in this column indicates the lack of such a facility at this particular mine

TK - An "X" in this column indicates that the particular mine has a truck loading facility; a BLANK indicates the lack of such a facility

RR - An "X" in this column indicates that the particular mine has a rail loading facility; a BLANK indicates the lack of such a facility

VOL - An "X" in this column indicates that the particular mine received a volume rail car rate for shipments in 1967; a BLANK indicates the lack of such a rate for 1967 shipments

UNIT - An "X" in this column indicates that the particular mine has unit train loading equipment; a BLANK in this column indicates the lack of such equipment

BGE - An "X" in this column indicates that the particular mine has barge loading facilities; a BLANK indicates the lack of such facilities

---

TOTAL TONS - The total 1967 production in thousands of tons at the particular mine

DRCT - This column indicates that percentage of the total coal sold in 1967 from the particular mine which was sold directly to consumers. Percentages have been coded according to the following table:

"11" - indicates	100%
"10" - indicates	90 - 99%
"9" - indicates	80 - 89%
"8" - indicates	70 - 79%
"7" - indicates	60 - 69%
"6" - indicates	50 - 59%
"5" - indicates	40 - 49%
"4" - indicates	30 - 39%
"3" - indicates	20 - 29%
"2" - indicates	10 - 19%
"1" - indicates	1 - 9%
"0" - indicates	0%

(percentages from Form 225 responses have been rounded to the nearest whole percent prior to assigning the above code numbers)

AGNT - This column indicates that percentage of the total coal sold in 1967 from the particular mine which was sold through an independent sales agency; percentages have been coded according to the above table

WHL - This column indicates that percentage of the total coal sold in 1967 from the particular mine which was sold through a wholesale distributor; percentages have been coded according to the above table

RET - This column indicates that percentage of the total coal sold in 1967 from the particular mine which was sold through a retail distributor; percentages have been coded according to the above table

OTH - This column indicates that percentage of the total coal sold in 1967 from the particular mine which was sold through some other method of sale; percentages have been coded according to the above table

---

PRODUCING DISTRICT - The Freight Rate District in which the particular mine is located

2. Set P-I, Report G_2

Report G_2 shows (1) the number of mines in Mining Districts 9, 10, and 11 for which a response to the Court-ordered Subpoena Questionnaire was received whose 1967 production was within the specified ranges and (2) the total 1967 tonnage in thousands of tons for all the mines within each specified range. This has been computed for the following categories:

(1) all mines,

(2) all strip mines,

(3) all deep mines,

(4) all strip/deep mines, and

(5) all "leading [company]" mines and all "other [company]" mines, as designated in Set P-I, Reports F_1 and F_2 respectively.

COLUMN HEADING EXPLANATION

Coal Characteristics By Producing Districts

The following is an explanation of the column headings which appear in "PRODUCER DATA EXHIBITS, Coal Characteristics By Producing Districts" in Sets P-2A, P-2B, and P-2C, DEFENDANTS' EXHIBIT NO. 51:

1. Set P-2A, Reports 1-12

Column:	Explanation:
TONS -	The total 1967 tonnage (in thousands of tons) of (raw)(washed) coal produced at all mines of the given type (strip, deep, or strip/deep) in the producing district specified in the respective reports
BTU -	The average British Thermal Units (in hundreds of units) of the (raw)(washed) coal produced at all the mines of the given type in the producing district specified in the respective reports; [all averages have been weighted by the number of tons produced at each BTU level in the total sample]
SULPHUR -	The average sulphur (to the nearest 1/100th of 1%) of the (raw)(washed) coal produced at all the mines of the given type in the producing district specified in the respective reports; [all averages have been weighted by the number of tons produced at each sulphur percentage in the total sample]
MOIST -	The average moisture (to the nearest one-tenth of 1%) of the (raw)(washed) coal produced at all the mines of the given type in the producing district specified in the respective reports; [all averages have been weighted by the number of tons produced at each moisture percentage in the total sample]

Column:	Explanation:
ASH -	The average ash (to the nearest one-tenth of 1%) of the (raw)(washed) coal produced at all the mines of the given type in the producing district specified in the respective reports; [all averages have been weighted by the number of tons produced at each ash percentage in the total sample]
FUSION -	The average fusion temperature (to the nearest whole degree) of the (raw)(washed) coal produced at all the mines of the given type in the producing district specified in the respective reports; [all averages have been weighted by the number of tons produced at each fusion temperature level in the total sample]

2. Set P-2B, Reports 1-12

Column:	Explanation:
TONS -	See explanation for Set P-2A, Reports 1-12
BTU -	-do-
SULPHUR -	-do-
MOIST -	-do-
ASH -	-do-
FUSION -	-do-

For each producing district, the above coal characteristics have been computed for raw coal and for washed coal produced according to the following sizes:

Code:	Size:
"Size 1" -	dust
"Size 2" -	carbon (0" x 1/4")
"Size 3" -	blends
"Size 4" -	screenings
"Size 5" -	all other sizes

For each producing district, the above characteristics have been computed for raw coal and for washed coal produced at the strip, deep, and strip/deep mines located in the specified producing district. The summary at the bottom of each Report indicates the total 1967 raw coal production and the total 1967 washed coal production (in thousands of tons) for the specified producing district.

3. Set P-2C, Reports 1-3

Column:	Explanation:
MINES -	The number of mines in the given producing district which produced the particular type of coal specified in the respective reports
BTU -	See explanation for Set P-2A, Reports 1 through 3
TONS -	-do-
BTU -	-do-
SULPHUR -	-do-
MOIST -	-do-
ASH -	-do-
FUSION -	-do-

Report 1 is a recapitulation of the washed coal characteristics for all sizes (combined) for each producing district in Mining Districts 9, 10, and 11.

Report 2 is a recapitulation of raw coal characteristics for all sizes (combined) for each producing district in Mining Districts 9, 10, and 11 which produces raw coal.

Report 3 is a recapitulation of the characteristics for the "dust size" coal, both washed and raw, produced in each producing district in Mining Districts 9, 10, and 11 which produces dust.

The summary at the bottom of each report indicates the total number of mines in Mining Districts 9, 10, and 11 which produced coal of the specified type and the aggregate 1967 production of that type at those mines.

COLUMN HEADING EXPLANATION

"Analysis: Overburden of Strip Mines and Depth of Deep Mines By Producing Districts"

The following is an explanation of the column headings which appear in "PRODUCER DATA EXHIBITS, Analysis: Overburden of Strip Mines and Depth of Deep Mines By Producing Districts" in Set P-I, Reports E_1 - E_7 and G_1, DEPENDANTS' EXHIBIT NO. 52 :

1. Set P-I, Reports E_1 - E_7

Column:	Explanation:
COAL CO. -	(See Abbreviation Key)
MINE -	(See Abbreviation Key)
SEAM NO. -	The seam mined at the particular mine in 1967. The digit which appears in the column is the same as the seam number mined, except that the code number "20" has been assigned to the Davis-DeKoven Seam and the code number "50" has been assigned to the Brazil Block Seam. In those cases where more than one seam was mined in 1967, a separate line for each seam is shown.
RATIO* -	The range within which the average overburden ratio at the given mine for 1967 stripping operations is included
SEAM THCK -	Thickness (in inches) of the seam mined in 1967 at the given mine
DEPTH DEEP** -	The average depth of deep mining operations (in feet) for the year 1967

MAX OB* - The maximum overburden (in feet) at the given mine for 1967 stripping operations

AVE OB* - The average overburden (in feet) at the given mine for 1967 stripping operations

TOTAL TONS - The total 1967 production at the given mine in thousands of tons

PRODUCING DISTRICT - The Freight Rate District in which the given mine is located

Each report contains mine characteristics for the strip mines (if any), the deep mines (if any), and for the strip/deep mines (if any) located in the producing district(s) as specified in the respective reports.

2. Set P-I, Report G_1

Report G_1 is a "frequency distribution" of average overburden ratios for all strip and strip/deep mines in Mining Districts 9, 10, and 11 for which a response to the Court-ordered Subpoena Questionnaire was received. Under each column which appears under the title "OVERBURDEN RATIO CATEGORY" is listed both the number of strip, or strip/deep, mines which had an average overburden within the given range in 1967 and the total 1967 production in thousands of tons for those mines. For both strip

---

* Applies to strip and strip/deep mines only.

** Applies to deep and strip/deep mines only.

mines and for strip/deep mines, there are summary tables setting forth the average "average overburden" (in feet) for all of the mines listed under each overburden ratio category. These average "average overburden" figures have been weighted by the number of tons which were produced at each average overburden in the total sample.

CONSUMER Q-NAIRE

Form Number 100

GENERAL INSTRUCTIONS

The questionnaires seek two types of information: (1) details concerning purchases of coal of 20,000 tons or more in 1966 and 1967 or equivalent 12-month periods, for each of your facilities located in Illinois, Indiana, Kentucky, Tennessee, Missouri, Iowa, Wisconsin or Minnesota which consumed coal produced in Illinois, Indiana or West Kentucky (mining districts 9, 10 and 11); and (2) information concerning the characteristics of each such facility as they relate to the consumption of coal. The first questionnaire requests separate information for each mine supplying each facility. The second asks for information about the facility itself. Examples of completed questionnaires are provided as a guide.

The information sought should be for the company, organization, or agency named in the subpoena, as well as for all subsidiaries, affiliates and divisions. The forms enclosed may be reproduced or copied if a sufficient number have not been supplied.

Questionnaires should be completed ONLY for those facilities located in Illinois, Indiana, Kentucky, Tennessee, Missouri, Iowa, Wisconsin or Minnesota which consumed coal produced in Illinois, Indiana or West Kentucky (mining districts 9, 10 and 11). No questionnaire need be completed for facilities NOT located in the states mentioned.

SPECIFIC INSTRUCTIONS

I. COAL PURCHASES QUESTIONNAIRE

The information sought should be provided for 1966 and 1967, or equivalent 12-month periods ending as close to December 31, 1966 and December 31, 1967 as possible, for each facility which consumed coal produced in Illinois, Indiana or West Kentucky. For example, if your purchasing "season" or existing contracts terminate on a date other than December 31, use the "seasons" or contract termination dates nearest to December 31 of 1966 and 1967, and indicate the period used at the top of each questionnaire.

A separate form should be used for each mine supplying a particular facility. No form need be filled out for mines whose total shipments of coal to the facility during the year in question were less than 20,000 tons.

Where purchases are made from firms other than actual coal producers, please provide as much information as is known.

The following instructions are numbered to correspond to specifically numbered questions.

#5. If, during the applicable year, more than one purchasing method was used to buy coal from the mine involved, estimate the percentage of the total tons purchased from that mine by each means of purchase.

#6. The information sought in all parts of question #6 should be broken down according to coal size.

#6(a). Please identify each variety of blend, screenings or "other" size supplied.

#6(b). Tons purchased should be broken down according to size and may be approximate.

#6(c). "F.O.B. Mine" should be interpreted as referring to the price per ton at either the mine or its originating shipping point. Contract or purchase order price should be used, gross of discounts, premiums or penalties.

#6(d). This information should correspond either to contract guarantee requirements or, if there is no contract guarantee, to expectation. Results of your own sampling analysis are not necessary, but, if used, should be indicated by "(S)".

#6(e), (f), (g), and (h). For each listed characteristic (i.e., sulphur content, moisture content, ash content, and fusion temperature) indicate, by minimum, maximum or range, as appropriate, the requirements you specified that the coal meet. If no requirement was specified, insert "None."

#7. Please indicate all methods used to transport the coal from the mine involved to your facility. If more than one method of transportation is used, please provide the information requested for each method.

II. COAL CONSUMING FACILITY QUESTIONNAIRE

This questionnaire should be completed for each facility in Illinois, Indiana, Kentucky, Tennessee, Missouri, Iowa, Wisconsin or Minnesota which consumed 20,000 tons or more of coal in 1967 that was produced in Illinois, Indiana or West Kentucky.

Questions 7, and 8 are designed to obtain information with respect to the characteristics of the coal that was required in 1967 for the type of equipment in which the coal was used at the facility.

PRODUCER Q-NAIRE

Form Number 200

GENERAL INSTRUCTIONS

The questionnaires seek two types of information: (1) details concerning mining conditions, characteristics of coal produced and mine facilities in 1967 for each of your mines in mining districts 9, 10 and 11 (Illinois, Indiana and West Kentucky); and (2) estimates of coal reserves, as of recent date, in mining districts 9, 10 and 11. Examples of completed questionnaires are provided as a guide.

The information sought should be supplied for the company named in the subpoena, as well as for all subsidiaries, affiliates and divisions. The forms enclosed may be reproduced or copied if a sufficient number have not been supplied.

SPECIFIC INSTRUCTIONS

I. MINE INFORMATION

The first questionnaire requests separate information for each of your mines. A separate form should be used for each mine. The information sought should be provided for 1967, or, if your records are not kept on a calendar year basis, for the 12-month period ending as close to December 31, 1967 as possible.

Question #10: the information sought in all parts of #10 should be broken down according to coal size. Tons produced [#10(b)] for each coal size may be approximate. Please identify each variety of blend, screenings and "other" size produced. Note that your answer concerning the minimum and maximum price per ton of coal F.O.B. mine [#10(c)] is to be limited to information concerning shipments of 20,000 tons or more to facilities located in Illinois, Indiana, Kentucky, Tennessee, Missouri, Iowa, Wisconsin or Minnesota.

II. RESERVES

The most recent annual compilation of reserves by your company should be used and the date indicated. Please include data with respect to reserves owned, leased or optioned by any subsidiary, affiliate, division or nominee.

Form Number 150

1967

PLEASE SEE ENCLOSED INSTRUCTIONS BEFORE COMPLETING QUESTIONNAIRE

1. Company and address (please include zip code)
   XYZ Company
   126 Main Street
   Metropolis Center, Illinois 60002

2. Name & title of officer supervising compliance with subpoena: John Smith, Purchasing Director

SAMPLE

COAL PURCHASES

(From Particular Mine for Particular Facility)
Use Separate Form for Each Mine

1967

Note: If information is not available for calendar year 1967, indicate beginning and ending date for 12 month period used (SEE INSTRUCTIONS): Period beginning _____, 196__; ending _____, 196__

3. Name and location of company's facility: Franklin Works Plant
   Franklin, Illinois 60620

4. Name of supplier and supplying mine: ABC Coal Co.
   Black Beauty No. 1
   (Describe mine by name; if unknown, describe by location or shipping point.)

5. Method(s) of purchase of coal from mine named in #4 (Check appropriate box(es).)

   a. Contract ☒ Percentage of tonnage, if not 100% _____%
      Effective date January 1, 1965
      Termination date December 31, 1972
      Renewal provisions, if any Option to renew for addition 7 years

   b. Purchase Order ☐ Percentage of tonnage, if not 100% _____%.

   c. Other (please specify) ☐ _____
      Percentage of tonnage, if not 100% _____%.

4. Coal Information. For 1967 purchases from Supplying Mine named in #4 (SEE INSTRUCTIONS):

(a) Size Group	(b) Tons Purchased	(c) Average Price Per Ton F.O.B. Mine, Excluding Sales Taxes	(d) Avg. BTU As Received	(e) Average Content of Coal As Received, Per Cent	(f) Sulfur Content (As Received) Per Cent	(g) Ash Content (As Received) Per Cent	(h) Average Percentage Moisture, As Received, Per Cent	(i) Size Group Mine Run	(j) Percent of Mine Output
Dust									
0"x¼" (carbon)									
Slacks (specify types) 2½ Carbon 1¼ x 1-1/4": x	400,000	4.10	11,200	2.5			10	5	2000	1	*
2.											
3.											
Screenings (specify sizes) 1.											
2.											
3.											
4.											
Other (specify) 1. 6" x 8"	175,000	4.25	14,000	2.5			12	12	2000	1	
2.											

SAMPLE

SAMPLE

* State (by using appropriate number(s)) whether coal: (1) is gassy, (2) is gassy, (3) is gassy, (4) is gassy, or (5) is gassy.

7. Method(s) and cost of transportation from supplying mine named in #4. (If the method varied, described separately each method. If cost, by method, varied during year, list each cost and indicate effective date.)

Method #1

Percent of coal shipped by this method 100 %

(Check appropriate box(es))

	Cost per ton
a. ☐ Truck	
b. ☒ Rail	$ .45
c. ☒ Dump	.15
d. ☒ Barge	.80
e. ☐ Lake vessel	
Total Cost Per Ton	$1.40

Method #2

Percent of coal shipped by this method ____ %

(Check appropriate box(es))

	Cost per ton
a. ☐ Truck	
b. ☐ Rail	
c. ☐ Dump	
d. ☐ Barge	
e. ☐ Lake vessel	
Total Cost Per Ton	

8. Routing(s) of transportation, if known: MOPAC to Ford Dock into Valley Line Barge

9. If route terminated by rail at your facility, designate whether shipments were made in single cars ☐ ____ % or volume train rate ☐ ____ %, or via unit train ☐ ____ %.

(Check appropriate box(es) and state percent of tonnage, if not 100%.)

SAMPLE

Form Number 175

PLEASE SEE ENCLOSED INSTRUCTIONS BEFORE COMPLETING QUESTIONNAIRE

1. Company and address (please include zip code) XYZ Company
126 Main Street
Metropolis Center, Illinois 60002

2. Name & title of officer supervising compliance with subpoena John Smith, Purchasing Director

SAMPLE

COAL CONSUMING FACILITY

(Use one form for each facility)

1967

Note: If information is not available for calendar year 1967, indicate beginning and ending date for 12 month period used (SEE INSTRUCTIONS): Period beginning _____, 196__; ending _____, 196__

3. Name and location of facility (please include zip code, if known) Franklin Works Plant
Franklin, Illinois 60620

4. Purpose(s) for which coal is purchased (check appropriate box(es)). If coal is purchased for more than one purpose, designate the percentage purchased for each purpose:

a. Generate power	☒	100 %
b. Building heat	☐	_____ %
c. Processing heat	☐	_____ %
d. Making coke	☐	_____ %
e. Other (specify)	☐	_____ % _____

5. For which of the purposes listed in #4 is the facility equipped to use:

a. Gas	4a. ☒	4b. ☐	4c. ☐	4d. ☐	4e. ☐
b. Oil	4a. ☐	4b. ☐	4c. ☐	4d. ☐	4e. ☐
c. Other energy or fuel (please specify) Purchased Electricity	4a. ☒	4b. ☐	4c. ☐	4d. ☐	4e. ☐

6. If a fuel was used in part or in whole in place of coal for any of the purposes designated in #4 during the year 1967, designate purpose and the period of time during which such other fuel was so used:

Fuel	Purpose	Month(s) when used
Gas	4a. ☒ 4b. ☐ 4c. ☐ 4d. ☐ 4e. ☐	April-September
Oil	4a. ☐ 4b. ☐ 4c. ☐ 4d. ☐ 4e. ☐	
Other (specify) _____	4a. ☐ 4b. ☐ 4c. ☐ 4d. ☐ 4e. ☐	

7. Type(s) of fuel burning equipment or kiln in which coal is consumed at this facility:

Type #1: Chain Grate, Laclede Model 507

Type #2: Pulverizer, B.&W., with Raymond Bowl Mill

Type #3: _____

Type #4: _____

SAMPLE

8. For each type of equipment or kiln listed in #7, indicate, in terms of minimum or maximum, or both, where range is applicable, those characteristics, if any, that the coal, as burned, must meet.

If none of these characteristics are required, check box ☐

	Type #1		Type #2		Type #3		Type #4	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Coal size	1/4"	1-1/4"		6"				
% of carbon (0"x⅛")		25						
% of dust		None	20					
% of sulphur (as rec'd)		2.5		2.5				
% of ash (as rec'd)	5	15		27				
% of moisture (as rec'd)		10		12				
BTU (as rec'd)	11,500		14,000					
Fusion temp. (A.S.T.)	2000			2600				

	Yes	No	Yes	No	Yes	No	Yes	No
Washed	x		x					
Washed & heat dried	x		x					

Other requirements (please specify):

Type #1 _____

Type #2 Grindability Index of 50 (Hardgrove)

Type #3 _____

Type #4 _____

SAMPLE

9. Are the types of equipment listed in #7 above convertible to use coal with characteristics other than those described above in #8? If yes, state, by each type of equipment, those characteristics which it can be converted to use, the cost of conversion, and time required (in months) for conversion:

	Yes	No	
Type #1	☐	☒	Characteristics:
			Cost:
			Time Required:
Type #2	☐	☒	Characteristics:
			Cost:
			Time Required:
Type #3	☐	☐	Characteristics:
			Cost:
			Time Required:
Type #4	☐	☐	Characteristics:
			Cost:
			Time Required:

SAMPLE

Form Number 225

PLEASE SEE ENCLOSED INSTRUCTIONS BEFORE COMPLETING QUESTIONNAIRE

1. Company and address (please include zip code) ABC COAL CO.
   127 Main Street
   Coalville, Illinois 60001

2. Name & title of official supervising compliance with subpoena John Doe, Exec. Vice-President

SAMPLE

MINE INFORMATION

(Use one form for each mine)

1967

Note: If information is not available for calendar year 1967, indicate beginning and ending date for 12 month period used (SEE INSTRUCTIONS): Period beginning _____, 196__; ending _____, 196__

3. Name of Mine Black Beauty No. 1

4. Seams mined in 1967 No. 5

5. Average seam thickness 52 inches

6. Type of mine (check appropriate box): strip ☒; deep ☐; other (specify) ☐

7. If deep mine, average depth to coal mined during 1967: _____

8. If strip mine, depth to coal mined during 1967:
   Average 60 feet
   Maximum 85 feet

9. If strip mine, what was the average overburden ratio for the mine during 1967 (check appropriate box):
   - ☒ Less than 15 to 1.
   - ☐ Between 15 to 1 and 20 to 1.
   - ☐ Between 20 to 1 and 25 to 1.
   - ☐ Between 25 to 1 and 30 to 1.
   - ☐ Over 30 to 1.

10. Characteristics of coal produced at the mine in 1967 (SEE INSTRUCTIONS):

Size	(1) Tonnage	(2) Moisture and Bituminous sales basis	(3) Ash	(4) Sulfur	(5) Volatile	(6) Btu
	tons —	tons — — —	tons —	tons —	tons —	tons —
Run						
0"x¼" (screen)						
Blends (specify types)						
1. 30% 3" x 1-1/2" 70% 1-1/2" x 28M	460,000	4.00 4.25	10,600	3.25	10-1/2	2100*
2.						
3.						
Screenings (specify sizes)						
1. 1-1/2" x 28M	425,000	3.90 4.15	10,500	3.15	15	2100*
2.						
3.						
4.						
Other (specify)						
1.						
2.						

* For shipments of 30,000 tons or more to facilities located in Illinois, Indiana, Kentucky, Tennessee, Missouri, Iowa, Wisconsin, or Minnesota

SAMPLE

SAMPLE

11. Preparation and loading facilities available at the mine, whether owned, leased, or used (check appropriate boxes):

Facility	
a. Washer and Sizer	☒
b. Dryer	☒
c. Truck Loading (either through silo, bin loading, or from a coal storage pile)	☒
d. Rail Loading	☒
e. Volume [illegible] Car Basis	☒
f. Unit Train Loading	☐
g. Barge Loading	☐

12. Method(s) of selling coal during 1967 (state % sold by each method):

Method	% of Sales
a. Direct to consumer	94
b. Through independent sales agency	
c. Through wholesale distributor	2
d. Through retail distributor	4
e. Other (specify) _____	

13. Type of carriers used in shipping coal which was sold during 1967 (check appropriate boxes):

a. Truck	☒
b. Rail	☒
c. Barge	☐
d. Lake vessel	☐
e. Other (specify)	☐ _____

SAMPLE

Form Number 25

PLEASE SEE ENCLOSED INSTRUCTIONS BEFORE COMPLETING QUESTIONNAIRE

1. Company and address (please include zip code) ABC Coal Co.
127 Main Street
Coalville, Illinois 60001

2. Name & title of officer supervising compliance with subpoena John Doe, Exec. Vice Presiden

SAMPLE

COAL RESERVE ESTIMATE

The estimated tonnage should include all coal owned in fee, under lease or optioned by your company and any subsidiary, affiliate, division or nominee as of the most recent compilation. Only reserves located in mining districts 9, 10 and 11 (Illinois, Indiana or West Kentucky) need be shown.

3. COAL RESERVES DEDICATED TO EXISTING MINES:

NAME OF MINE	Estimated Strip Tonnage (Tons)	Estimated Deep Tonnage (Tons)	Percentage of Recovery Used for Estimated Tonnage	
			Strip	Deep
Black Beauty No. 1	30,000,000		80	
Black Beauty No. 2	20,000,000		80	
Sally Ann		50,000,000		55
Total Tons:	50,000,000	50,000,000		

4. OTHER COAL RESERVES (owned, leased, or optioned by your company or any subsidiary, affiliate, division or nominee, as of most recent compilation, located in mining districts 9, 10, and 11 (Illinois, Indiana, and West Kentucky)):

COUNTY	STATE	Estimated Strip Tonnage (Tons)	Estimated Deep Tonnage (Tons)	Percentage of Recovery Used for Estimated Tonnage	
				Strip	Deep
Coal County	Ill.		47,000,000		55
River County	Ill.	35,000,000		90	
Mine County	Ky.		250,000,000		55
Smith County	Ind.	30,000,000		90	
Total Tons:		65,000,000	297,000,000		

SAMPLE

5. Explain briefly methods used for determining percentage of recovery for both strip and deep tonnage:

Strip: Prior mining experience in seams involved

Deep: Prior mining experience using conventional equipment

6. Information supplied is as of December 31, 1968

Filed 3/11/69

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff, v. GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, Defendants.	)	CIVIL ACTION NO. 67 C 1632

AGREED ORDER

Pursuant to the stipulation of the parties by their respective attorneys, and for the purpose of avoiding the necessity of deposing officers and managerial personnel of the respondents designated below,

IT IS HEREBY ORDERED that the Clerk of the United States District Court for the Northern District of Illinois, Eastern Division, shall issue subpoenas duces tecum in the form attached for service in any judicial district of the United States upon the respondents listed in Exhibit A to this Order. Such service may be made by the Clerk by registered mail, return receipt requested.

Such subpoenas shall command such respondents to appear and produce for examination, inspection, and copying by attorneys for the parties at the Office of the Clerk of the Court of said Northern District of Illinois, Eastern Division, 219 South Dearborn Street, Chicago, Illinois 60604, all documents in respondent's possession showing, in whole or in part, the information requested by the attached questionnaire or, in lieu of such appearance and production, to mail a full and complete response to the questionnaire signed by a responsible officer of the company on which the subpoena is served who has personal knowledge of the company's compliance with the subpoena and under whose supervision compliance is being effectuated.

IT IS FURTHER ORDERED that the documents and the contents thereof, and the responses to the attached questionnaire, shall not be disclosed to any officer, director, employee or agent of any defendant or of any coal producer, seller, or customer except upon a showing of good cause and further order of this court.

_____
United States District Judge

We agree to the entry of the foregoing order this 11th day of March, 1969.

REUBEN L. HEDLUND

DONALD G. KEMPP, JR.

Attorneys for
General Dynamics Corporation,
The United Electric Coal
Companies and Freeman Coal
Mining Corporation

JOHN E. SARBAUGH

JOHN T. CUSACK

Attorneys, Department of Justice

Room 2634 United States Courthouse
Chicago, Illinois 60604

EXHIBIT A

Abbott Laboratories
4th Street, Sheridan Rd.
North Chicago, Illinois

A E Staley Mfg. Co.
220 E. Eldorado
Decatur, Illinois 62525

Airco Chemicals & Plastics
P.O. Box 97
Calvert City, Kentucky 42029

Allis-Chalmers Mfg. Co.
P.O. Box 512
Milwaukee, Wisconsin 53201

Alpha Portland Cement Co.
15 South 3rd Street
Easton, Pennsylvania

Alton Box Board Company
P.O. Box 276
Alton, Illinois 62002

American Can Company
100 Park Avenue
New York, New York 10017

American Crystal Sugar Company
P.O. Box 419
Denver, Colorado

American Distilling Co.
24 Park Avenue
New York, New York

American Electric Power Company, Inc.
2 Broadway
New York, New York 10004

American Maize Products Company
113th & Indianapolis Blvd
Roby, Indiana

American Motors Corp.
14250 Plymouth Road
Detroit, Michigan 48232

American Oil Company
Purchasing Department
P.O. Box 6110-A
Chicago, Illinois 60680

Anheuser Busch, Inc.
721 Pestalozzi Street
St. Louis, Missouri

Argonne National Lab.
Box 299
Lemont, Illinois

Arkla Air Conditioning Corp.
Division of Arkla Indiana Inc.
Evansville, Indiana

Armour & Company
401 N. Wabash Avenue
Chicago, Illinois 60690

Atkinson & Co.
11750 Chesterdale Road
Cincinnati, Ohio 45246

Automatic Electric Company
400 N. Wolf Road
Northlake, Illinois 60164

B.F. Goodrich Co.
277 Park Avenue
New York, New York 10017

Brown-Forman Distillers Corp.
1908 Howard Street
Louisville, Kentucky

Campbell Soup Company
375 Memorial Avenue
Camden, New Jersey 08101

Caterpillar Tractor Company
100 N. E. Adams Street
Peoria, Illinois 61602

Celotex Corp.
1500 N. Dale Mabry
Tampa, Florida 33607

Central Illinois Electric and Gas Co.
P.O. Box 767
Chicago, Illinois

Central Illinois Light
300 Liberty Street
Peoria, Illinois

entral Illinois Public Service Co.
607 East Adams Street
Springfield, Illinois

Central Electric Power Corp.
P.O. Drawer 127
Chamois, Missouri 65024

Central Soya Co., Inc.
300 Ft. Wayne Bank Bldg.
Ft. Wayne, Indiana 46802

Charmin Paper Products Company
501 East Sixth Street
Cincinnati, Ohio 45202

Chas. Pfizer and Company, Inc.
235 East 42nd Street
New York, New York 10017

Chemcoke Division
Peabody Coal Company
301 North Memorial Drive
St. Louis, Missouri 63102

Chrysler Corporation
341 Massachusetts Ave
Detroit, Michigan 48231

Cincinnati Gas & Elec. Co.
P.O. Box 960
ncinnati, Ohio

Citizens Gas & Coke Utility
2020 N. Meridian Street
Indianapolis, Indiana

City Light and Power Plant
Frankfort, Indiana

City of Peru Power Plant
Peru, Illinois

City of Springfield Water & Light & Power Departments
City Hall
Springfield, Illinois

Clinton Corn Processing Company
Clinton, Iowa 52732

Colgate Palmolive Co.
300 Park Avenue
New York, New York 10022

Colt Industries, Inc.
1290 Avenue of the Americas
New York, New York 10019

Commanding Officer
U.S. Army
Iowa City Ammunition Plt
W. Burlington, Iowa

Commanding Officer
Rock Island Arsenal
Rock Island, Illinois

Commercial Solvents Corp.
P.O. Box 420
Terre Haute, Indiana

Commonwealth Edison Company of Indiana, Inc.
Old P.O. Annex, Box 767
Chicago, Illinois 60690

Commonwealth Edison Co.
72 W. Adams Street
Chicago, Illinois

Consolidated Papers, Inc.
Wisconsin Rapids
Wisconsin 54494

Container Corp. of America
404 F. North Water St.
Chicago, Illinois 60611

Continental Can Co., Inc.
633 Third Avenue
New York, New York 10017

Continental Motors Corp.
Muskegon, Michigan

Contracting Officer
Defense Fuel Supply Ctr
Cameron Station
Alexandria, Va. 22314

Corn Belt Power Coop
Humboldt, Iowa

Corn Products International Plaza
Englewood Cliffs
New Jersey 07632

Crawfordsville Light & Power
P.O. Box 428
Crawfordsville, Ind. 4793

Dairyland Power Coop
2615 E. Avenue S.
LaCrosse, Wisconson

'arling and Co.
401 S. Ashland Avenue
Chicago, Illinois 60609

Deere and Company
John Deere Road
Moline, Illinois 61265

Dewey Portland Cement Co.
Fourth National Bank
Building
Tulsa, Oklahoma 74119

Drew Foods Corp.
3400 N. Wharf
St. Louis, Mo. 63107

Dubuque Packing Company
Dubuque, Iowa

Dundee Cement Company
Dundee, Michigan 48131

Eastern Iowa Light and
Power Cooperative
Mountpelier, Iowa

E I Du Pont De Nemours
Company
P Pont Building
Wilmington, Delaware
19801

Electric Energy Inc.
Box 165
Joppa, Illinois

Eli Lilly and Company
740 S. Alabama
Indianapolis, Indiana

Fairfield Municipal
Light and Power Co.
Fairfield, Illinois

Federal Paper Board Co.
Morris, Illinois

Finance & Accounting
U.S. Army Procurement
Joliet, Illinois 60436

Foote Minerals
Kemco Operations
320 Concert Street
Keokuk, Iowa

Ford Motor Company
American Road
Dearborn, Michigan 48121

Ft. Wayne City Utilities
308 East Berry Street
Ft. Wayne, Indiana 46802

Frankfort City Light
and Power Plant
City Building
Frankfort, Indiana

General Motors Corp.
3044 West Grand Blvd.
Detroit, Michigan 48202

General Tire & Rubber Co.
1708 Englewood Avenue
Akron, Ohio 44309

Grain Processing Corp.
1600 Oregon Street
Muscatine, Iowa 52761

Granite City Steel Co.
Granite City, Illinois

Gulf Oil Corporation
Gulf Building
Pittsburgh 30, Pa.

H. Walker & Sons
2409 S. Washington &
Edmund Streets
Peoria, Illinois

Hercules, Inc.
910 Market Street
Wilmington, Delaware

Hubinger Company
601 Main Street
Keokuk, Iowa

Illinois Cereal Mills
Paris, Illinois

Illinois Power Company
500 S. 27th Street
Decatur, Illinois

Indiana and Michigan Electric Company
2101 Spy Run Avenue
Ft. Wayne, Indiana

Indiana-Ky Elec. Corp.
Clifty Creek Station
P.O. Box 97
Madison, Indiana

Indianapolis Power & Light
25 Monument Circle
Indianapolis, Ind. 46206

Indiana University
Purchasing Dept.
Bloomington, Indiana

Ingalls Shephard Div.
Wyman-Gordon Company
146th Street & Wood
Harvey, Illinois

Inland Steel Co.
30 W. Monroe Street
Chicago, Illinois

Interlake Steel Corporation
310 South Michigan Ave
Chicago, Illinois 60604

International Harvester Company
401 N. Michigan Avenue
Chicago, Illinois 60611

Interstate Power Co.
1000 Main Street
Dubuque, Iowa

Iowa Electric Light & Power
P.O. Box 351
Cedar Rapids, Iowa

Iowa-Illinois Gas & Electric Company
206 E. 2nd Street
Davenport, Iowa

Iowa Power and Light Company
823 Walnut Street
Des Moines, Iowa

Iowa Public Service Co.
P.O. Box 778
Sioux City, Iowa

Iowa Southern Utilities Company
300 Sheridan
Centerville, Iowa 52544

Iowa State Penitentiary
Fort Madison
Iowa

J. I. Case Company
700 State Street
Racine, Wisconsin 53404

Jasper Municipal Light and Water Department
Seventy & Anderson St.
Jasper, Indiana

Joseph E. Seagram and Sons, Inc.
375 Park Avenue
New York, New York 10022

Kankakee State Hospital
Kankakee, Illinois

Kentucky Utilities Co.
Lexington, Kentucky

Keystone Steel and Wire Company
Peoria, Illinois

Kimberly Clark Corporation
North Lake Street
Neenah, Wisconsin 54946

Kosmos Portland Cement Co.
Kosmosdale, Kentucky

Lake Superior District Power Company
101 West Second Street
Ashland, Wisconsin 54806

Lehigh Portland Cement Company
Young Building
Allentown, Pa. 18105

Libbey-Owens Ford Company
811 Madison Avenue
Toledo, Ohio 43624

Logansport Electric Light and Power Plant
Sixth and Broadway
Logansport, Indiana 46947

Lone Star Cement Corp.
1800 N. Meridian Street
Indianapolis, Indiana

Louisville Cement Company
501 S. Second Street
Louisville, Kentucky 40202

Louisville Gas & Electric Company
311 West Chestnut Street
Louisville, Kentucky

Madison Gas & Electric Co.
x 1231
[illegible]0 W. Fairchild
Madison, Wisconsin

Mallinckrodt Chemical Wrks
2nd & Mallinckrodt Avenue
St. Louis 17, Missouri

Manitowoc Public Utilities
817 Franklin Street
Manitowoc, Wisconsin

Marathon Oil Company
539 South Main Street
Findlay, Ohio 45840

Marquette Cement Mfg. Co.
20 N. Wacker Drive
[illegible]icago, Illinois

Marshfield Electric
and Water Department
2000 S. Roddis Avenue
Marshfield, Wisconsin
54449

Medusa Portland Cement Co.
P.O. Box 5668
Cleveland, Ohio

Menasha Electric and
Water Utilities
182 Main Street
Menasha, Wisconsin

Metropolitan Sanitary
District of Chicago
100 E. Erie
[illegible]icago, Illinois

Mississippi Lime Company
7 Alby Street
Alton, Illinois

Monsanto Company
800 North Lindbergh Blvd.
St. Louis, Missouri 63166

Mosinee Paper Mills Co.
Mosinee, Wisconsin

Mt. Carmel Pub Utilities
Mt. Carmel, Illinois

Municipal Electric Light
Department
Highland, Illinois

Municipal Water & Elec.
127 E. 3rd Street
Muscatine, Iowa

National Biscuit Company
425 Park Avenue
New York, New York 10022

National Distiller Prod.
99 Park Avenue
New York, New York 10016

National Lead Company
111 Broadway
New York, New York 10006

National Lock Company
1902 Seventh Street
Rockford, Illinois 61108

National Starch & Chemic-
al Corporation
750 Third Avenue
New York, New York 10017

Nekoosa Edwards Paper Co.
Port Edwards
Wisconsin

Northeast Missouri
Electric Power Coop
P.O. Box 191
Palmira, Missouri 63461

Northern Indiana Public
Service Co.
5265 Hohman Avenue
Hammond, Indiana 46320

Northern States Power
Company
414 Nicollet Mall
Minneapolis, Minn.

Northwestern States
Portland Cement
12 Second Street N.E.
Mason City, Iowa 50401

Northwestern University
Purchasing Dept.
906 University
Evanston, Illinois

Olin Mathieson Chemical
Corporation
460 Park Avenue
New York, New York 10022

Oscar Mayer & Co.
910 Mayer Avenue
Madison, Wisconsin

Ottawa Silica Co.
P.O. Box 577
Ottawa, Illinois 61350

Owensboro Municipal
Utilities
P.O. Box 581
Owensboro, Kentucky

Owens-Illinois, Inc.
P.O. Box 1035
Toledo, Ohio 43601

Packaging Corporation
of America
1632 Chicago Avenue
Evanston, Illinois 60201

Penick & Ford, Ltd.
920 First Street S.W.
Cedar Rapids, Iowa 52404

Penn-Dixie Cement Corp.
60 East 42nd Street
New York, New York 10017

Peru Electric Light
Department
39 East Third Street
Peru, Indiana

Proctor and Gamble Co.
301 East Sixth Street
Cincinnati, Ohio 45202

Public Service of Indiana
1000 E. Main Street
Plainfield, Indiana

Purdue University
L.P. Stevens Purch. Agent
Lafayette, Indiana

Radio Corporation of
America
RCA Building
30 Rockefeller Plaza
New York, N.Y. 10020

Republic Steel Corp.
Republic Building
Cleveland, Ohio 44101

Richmond Power & Light
P.O. Box 918
Richmond, Indiana 47374

Rochelle Municipal
Utilities
Rochelle, Illinois

Rochester Electric
Department
506 First Avenue N.E.
Rochester, Minnesota

The Ruberoid Company
P.O. Box 901
Joliet, Illinois

Scott Paper Company
International Airport
Philadelphia, Pa. 19113

Shell Oil Company
P.O. Box 262
Wood River, Illinois

Sherwin Williams Company
101 Prospect Avenue N.W.
Cleveland, Ohio 44101

Southern Illinois Power
Corporation
Marion, Illinois

Southern Indiana Gas &
Electric Co.
20-24 N.W. 4th Street
Evansville, Indiana

St. Louis Independent
Packing Company
824 S. Vandeventer Ave
St. Louis, Missouri 6311

St. Regis Paper Company
150 East 42nd Street
New York, New York 10017

Standard Brands, Inc.
625 Madison Avenue
New York, New York 10022

Standard Lime &
Refractories Co.
2000 First National Bank
Bldg.
Baltimore, Maryland 21203

State of Illinois
Purchases and Supplies
Room 400 - State Armory
Springfield, Ill. 62706

State University of Iowa
Iowa City, Iowa

Swift and Company
115 West Jackson Boulevard
Chicago, Illinois 60604

Tennessee Valley Authority
223 Edney Building
Chattanooga, Tenn. 37401

Thilmany Pulp & Paper Co.
Kaukuna, Wisconsin

U. S. Steel Corp.
71 Broadway
New York, New York 10006

Uniroyal, Inc.
Rockefeller Center
1230 Avenue of the Americas
New York, New York 10020

Union Carbide Corporation
Union Carbide Bldg.
270 Park Avenue
New York, New York 10017

Union Electric Company
P.O. Box 149
St. Louis, Missouri 63166

Union Starch & Refining Company
Granite City, Illinois

United States Glue
9006 Fifth Avenue
Oak Creek, Wisconsin 53154

U S Industrial Chemicals Company
P.O. Box 208
Tuscola, Illinois 61953

U.S. Naval Training Center Supply Office
Great Lakes, Illinois 60088

University of Illinois
223 Administration Bldg.
Urbana, Illinois 61801

The University of Iowa
Purchasing Department
Iowa City, Iowa 52240

Washington Light and Power Department
Van Trees and East Third Streets
Washington, Indiana

Wedron Silica Company
135 S. LaSalle Street
Chicago, Illinois 60603

Western Electric Company, Inc.
195 Broadway
New York, New York 10007

Western Ill. Elec. Coop.
524 N. Madison
Carthage, Ill.

Weston Paper and Manufacturing Company
910 Harries Building
Dayton, Ohio 45402

Whirlpool Corporation
Benton Harbor, Michigan 49022

Wisconsin Electric Power Company
231 W. Michigan Street
Milwaukee, Wisconsin 53201

Wisconsin Power and Light Company
122 W. Washington Street
Madison, Wisconsin

Wisconsin Public Service Corp.
P.O. Box 700
Green Bay, Wisconsin

The Youngstown Sheet and Tube Company
Purchasing Department
Youngstown, Ohio 44501

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff, v. GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, Defendants.	)	CIVIL ACTION NO. 67 C 1632

AGREED ORDER

Pursuant to the stipulation of the parties by their respective attorneys, and for the purpose of avoiding the necessity of deposing officers and managerial personnel of the respondents designated below,

IT IS HEREBY ORDERED that the Clerk of the United States District Court for the Northern District of Illinois, Eastern Division, shall issue subpoenas duces tecum in the form attached for service in any judicial district of the United States upon the respondents listed in Exhibit A to this Order. Such service may be made by the Clerk by registered mail, return receipt requested.

Such subpoenas shall command such respondents to appear and produce for examination, inspection, and copying by attorneys for the parties at the Office of the Clerk of the Court of said Northern District of Illinois, Eastern Division, 219 South Dearborn Street, Chicago, Illinois 60604, all documents in respondent's possession showing, in whole or in part, the information requested by the attached questionnaire or, in lieu of such appearance and production, to mail a full and complete response to the questionnaire signed by a responsible officer of the company on which the subpoena is served who has personal knowledge of the company's compliance with the subpoena and under whose supervision compliance is being effectuated.

IT IS FURTHER ORDERED that the documents and the contents thereof, and the responses to the attached questionnaire, shall not be disclosed to any officer, director, employee or agent of any defendant or of any coal producer, seller, or customer except upon a showing of good cause and further order of this court.

_____
United States District Judge

We agree to the entry of the foregoing order this ___ day of March, 1969.

REUBEN L. HEDLUND

DONALD G. KEMPF, JR.

Attorneys for
General Dynamics Corporation,
The United Electric Coal
Companies and Freeman Coal
Mining Corporation

JOHN E. SARBAUGH

JOHN T. CUSACK

Attorneys, Department of Justice

Room 2634 United States Courthouse
Chicago, Illinois 60604

EXHIBIT A

-shire Collieries
orporation
430 Big Four Building
Indianapolis, Indiana

Barbara-Kay Coal Co., Inc.
P.O. Box 397
Marion, Illinois

Basin Cream Coal Co., Inc.
Carterville, Illinois

Bell & Zoller Coal Co.
208 South LaSalle Street
Chicago, Illinois 60604

Belle Valley Coal Co.
D. 1
Belleville, Illinois

Big Muddy Coal Co.
P.O. Box 239
De Soto, Illinois

Black Tam Mining Co.
Wheatcroft, Kentucky

Blue Bird Coal Co.
224 S. Michigan Avenue
Chicago, Illinois

Bunny Coal & Construction
Co.
isonville, Kentucky

Burge Coal Co.
Hartford, Kentucky

Coiltown Mining Co.
425 S. Main Street
Madisonville, Kentucky

Consolidation Coal Co.
Truax-Traer Coal Co. Div.
111 North Wabash Avenue
Chicago, Illinois 60602

Decola Coal Co.
Dawson Springs, Kentucky

Eden Mining Corporation
Sparta, Illinois

Gibraltar Coal Corp.
105 S. Meridian Street
Indianapolis 25, Indiana

Green Coal Co.
P.O. Box 704
Owensboro, Kentucky

Harrisburg Coal Co., Inc.
Marion, Illinois

Houston Coal Co.
Route 5
Marion, Illinois

Island Creek Coal Co.
1501 Euclid Avenue
Cleveland, Ohio

Kirkpatrick Mining Co.
P.O. Box 290
Greenville, Kentucky

Liberty Coal Co.
Crab Orchard, Illinois

Little Dog Coal Co.
1724 Railway Exchange
Building
611 Olive Street
St. Louis, Missouri 63101

Mainline Coal Co.
Desota, Illinois

Marshall Equipment Co.
Harrisburg, Illinois

Morris Bros. Co.
Box 539
Owensboro, Kentucky

Morris Enterprises, Inc.
2108 East Clinton Place
Owensboro, Kentucky

New Gallatin Coal Co.
P.O. Box 411
Harrisburg, Illinois

Old Ben Coal Corp.
10 South Riverside Plaza
Chicago, Illinois 60606

Parton Coal Company
P.O. Box 332
Marion, Illinois

Peabody Coal Company
301 North Memorial Dr.
St. Louis, Missouri 63102

Pittsburg & Midway Coal Mining Co.
15 West 10th Street
Kansas City, Mo. 64105

Pyro Mining Co., Inc.
Wheatcroft, Kentucky

R & N Coal Co.
Cora, Illinois

R.S. & K. Coal Corp.
Bicknell, Indiana

Renfro & Kirkwood Coal Co.
Madisonville, Kentucky

Rialto Coal Co., Inc.
P.O. Box 368
Madisonville, Kentucky

Sahara Coal Company, Inc.
59 East Van Buren St.
Chicago, Illinois 60605

Sherwood-Templeton Coal Co., Inc.
2829 N. Meridian St.
Indianapolis, Indiana
46208

Southwestern Illinois Coal Corporation
1514 Merchants Bank Bldg.
Indianapolis, Indiana

Tab-Badgett Joint Venture Coal Co.
Madisonville, Kentucky

Weirs Creek Co.
Providence, Kentucky

Williams Bros. Mining Co., Inc.
Bowling Green, Kentucky

Wright Coal Co.
Box 291
Greenville, Kentucky

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff, v. GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, Defendants.	)	CIVIL ACTION NO. 67 C 1632

AGREED ORDER

Pursuant to the stipulation of the parties by their respective attorneys,

IT IS HEREBY ORDERED that the Agreed Orders entered in this case on March 11, 1969 be amended as follows:

1. The subpoenas duces tecum to be issued under such Agreed Orders shall be returnable on the 21st day of April, 1969;

2. Such subpoenas shall also be issued to the following:

Big Rivers Rural Electric Coop. Corp.
223 N. Main Street
Henderson, Kentucky 42420

Indiana State University
Purchasing Department
217 N. 6th Street
Terre Haute, Indiana 46609

State of Indiana, Division of
Public Works and Supplies
Room 510 - 100 North Senate
Indianapolis, Indiana

Weskol Mining Co.
Providence, Kentucky

State of Wisconsin Power Plant Engineer
743 State Office Building
Madison, Wisconsin

Ajax Coal Co., Inc.
Box 315
Marion, Illinois 62959

Arel Coal Sales, Inc.
Madisonville, Kentucky

B. B. Mining Co.
Beaver Dam, Kentucky

Caney Creek Coal Co.
Drakesboro, Kentucky

Dark Star Coal, Inc.
Madisonville, Kentucky

JoLor Mining Co.
208 S. LaSalle Street - Chicago, Illinois 60601

Russell Badgett, Jr. Coal Co.
Madisonville, Kentucky

Tab Mining Co.
P. O. Box 1168
Carbondale, Illinois

V-Day Coal Co.
Rural Rt. #1
Danville, Illinois 61835

Venedy Coal Co.
Venedy, Illinois 62296

Webster County Coal Corp.
Clay, Kentucky

United States District Judge

Dated: _____.

We agree to the entry of the foregoing order this 21st day of March, 1969.

REUBEN L. HEDLUND

JOHN E. SARBAUGH

DONALD G. KEMPF, JR.

JOHN T. CUSACK

Attorneys for
General Dynamics Corporation,
The United Electric Coal
Companies and Freeman Coal
Mining Corporation

Attorneys, Department of Justice

Room 2634 United States Courthouse
Chicago, Illinois 60604

SUBPOENA TO PRODUCE DOCUMENTS

United States District Court

FOR THE
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff, vs. GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES; and FREEMAN COAL MINING CORPORATION, Defendants.	)	CIVIL ACTION FILE NUMBER 67 C 1632

TO

YOU ARE COMMANDED to appear at ROOM 2634, UNITED STATES COURTHOUSE, 219 SOUTH DEARBORN STREET in the CITY OF CHICAGO, ILLINOIS, on the 21st day April, 1969, at 10:30 o'clock A.M. by direction of the Court pursuant to an order dated March 11, 1969, and agreed to by the parties in the above entitled action pending in the United States District Court for the Northern District of Illinois and to bring with you and to produce at the time and place aforesaid all documents in your possession showing, in whole or in part, the information requested by the attached questionnaire or, in lieu of such appearance and production of documents, to mail to Elbert A. Wagner, Jr., Clerk of the United States District Court for the Northern District of Illinois, 219 South Dearborn Street, Chicago, Illinois 60604, a full and complete response to the attached questionnaire signed by a responsible officer of the company who has personal knowledge of the company's compliance with this subpoena and under whose supervision compliance is being effectuated.

BY ORDER OF THE HONORABLE EDWIN A. ROBSON, DISTRICT JUDGE, UNITED STATES DISTRICT COURT for the NORTHERN DISTRICT of ILLINOIS

Clerk

Deputy Clerk

PRODUCER DATA EXHIBITS DX 49

Mine Characteristics

KIRALAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES

SET P-1 REPORT A

COAL CO.	MINE	PRODUCING DISTRICT	TYPE	TONS (000)	TRANSPORTATION USED			
AYRS	CHNK	BRAZIL-CLINTON	STRIP	1147	TRUCK	RAIL		
AYRS	DLTA	SOUTHERN	STRIP	976	RAIL			
AYRS	HARN	DANVILLE	STRIP	627	TRUCK	RAIL		
AYRS	MINN	LINTON-SULLIVAN	STRIP	1624	TRUCK	RAIL		
AYRS	SUNS	FULTON-PEORIA	STRIP	821	TRUCK	RAIL	BARGE	
AYRS	THUN	LINTON-SULLIVAN	DEEP	1229	RAIL			
AYRS	WRIT	PRINCETON-AYRSHR	STRIP	1285	RAIL	BARGE		
		AYRS COMPANY TOTAL TONS		7709				
BRKY	BRKY	SOUTHERN	DEEP	112	TRUCK			
		BRKY COMPANY TOTAL TONS		112				
DBMN	EBNY	W.KENTUCKY	STRIP	360	OTHER			
DBMN	NO2	W.KENTUCKY	STRIP	304	OTHER			
		DBMN COMPANY TOTAL TONS		664				
DLVY	DLVY	BELLEVILLE	DEEP	104	TRUCK			
		DLVY COMPANY TOTAL TONS		104				
DLGZ	MRDK	MURDOCK	DEEP	747	TRUCK	RAIL		
DLGZ	ZGL4	SOUTHERN	DEEP	1271	TRUCK	RAIL	BARGE	LAKE-VES
DLGZ	ZGL9	W.KENTUCKY	DEEP	533	RAIL	BARGE		
DLGZ	ORIL	W.KENTUCKY	DEEP	636	TRUCK	RAIL	BARGE	LAKE-VES
DLGZ	SPRT	BELLEVILLE	DEEP	882	TRUCK	RAIL	BARGE	
		DLGZ COMPANY TOTAL TONS		4069				
DLTH	DLTH	W.KENTUCKY	STRIP	107	RAIL			
		DLTH COMPANY TOTAL TONS		107				
DLBD	TANK	SOUTHERN	DEEP	183	TRUCK	RAIL		

COAL CO.	MINE	PRODUCING DISTRICT	TYPE	TONS (000)	TRANSPORTATION USED		
		BLSO COMPANY TOTAL TONS		163			
BRGE	BRGE	W.KENTUCKY	STRIP	122	TRUCK	RAIL	
		BRGE COMPANY TOTAL TONS		122			
TXTR	BST2	BELLEVILLE	STRIP	1500	RAIL	BARGE	
TXTR	BST3	BELLEVILLE	STRIP	1683	RAIL	BARGE	
TXTR	FIAT	FULTON-PEORIA	STRIP	1523	TRUCK	RAIL	BARGE
TXTR	HILS	SPRINGFIELD	DEEP	1169	OTHER		
TXTR	LEES	FULTON-PEORIA	STRIP	917	TRUCK	RAIL	BARGE
		TXTR COMPANY TOTAL TONS		6792			
DNKS	DCOH	W.KENTUCKY	STRIP	418	RAIL		
		DNKS COMPANY TOTAL TONS		418			
DCLA	DCLA	W.KENTUCKY	DEEP	102	TRUCK	RAIL	
		DCLA COMPANY TOTAL TONS		102			
GBRL	GBRL	W.KENTUCKY	STRIP	2034	BARGE		
		GBRL COMPANY TOTAL TONS		2034			
GREN	PRGR	W.KENTUCKY	STRIP	1044	TRUCK	BARGE	
		GREN COMPANY TOTAL TONS		1044			
HRBG	HRBG	SOUTHERN	DEEP	85			
		HRBG COMPANY TOTAL TONS		85			
HSTN	HSTN	SOUTHERN	STRIP	15	RAIL		
		HSTN COMPANY TOTAL TONS		15			
ISCK	EDIA	W.KENTUCKY	DEEP	2373	RAIL		
ISCK	FIES	W.KENTUCKY	DEEP	1442	TRUCK	RAIL	
ISCK	CRES	W.KENTUCKY	DEEP	1051	TRUCK	RAIL	
ISCK	UNTN	W.KENTUCKY	DEEP	1473	BARGE		

COAL CO.	MINE	PRODUCING DISTRICT	TYPE	TONS (000)	TRANSPORTATION USED			
ISCK	ATKN	W.KENTUCKY	DEEP	1470	RAIL			
ISCK	WILS	W.KENTUCKY	DEEP	231	TRUCK	RAIL		
ISCK	PLSV	W.KENTUCKY	STRIP	567	RAIL			
		ISCK COMPANY TOTAL TONS		8607				
JOLR	JOLR	SOUTHERN	STRIP	89	BARGE			
		JOLR COMPANY TOTAL TONS		89				
KIRK	CANY	W.KENTUCKY	STRIP	870	TRUCK	RAIL	BARGE	LAKE-VES
WRIT	WRIT	W.KENTUCKY	STRIP	521	TRUCK	RAIL	LAKE-VES	
		KIRK COMPANY TOTAL TONS		1391				
MORS	MRTN	W.KENTUCKY	STRIP	58	RAIL			
		MORS COMPANY TOTAL TONS		58				
OLDB	BLKF	PRINCETON-AYRSHR	STRIP	1458	TRUCK	RAIL	LAKE-VES	
OLDB	ENOS	PRINCETON-AYRSHR	STRIP	1675	RAIL	LAKE-VES		
OLDB	KING	PRINCETON-AYRSHR	DEEP	335	TRUCK	RAIL	LAKE-VES	
OLDB	NO21	SOUTHERN	DEEP	2240	TRUCK	RAIL	BARGE	LAKE-VES
OLDB	NO24	SOUTHERN	DEEP	2368	RAIL	LAKE-VES		
OLDB	NO9	SOUTHERN	DEEP	1391	TRUCK	RAIL	BARGE	LAKE-VES
		OLDB COMPANY TOTAL TONS		9467				
PATN	PATN	SOUTHERN	DEEP	66	TRUCK			
		PATN COMPANY TOTAL TONS		66				
PEAB	EAGL	SOUTHERN	STR/DEEP	309	BARGE			
PEAB	EDWD	FULTON-PEORIA	STRIP	537	TRUCK	RAIL	BARGE	
PEAB	HECO	HENERAL-ATKINSON	STRIP	1248	TRUCK	RAIL		
PEAB	HWST	BELLEVILLE	STR/DEEP	1413	TRUCK			
PEAB	NRTH	NORTHERN	STRIP	759	TRUCK	RAIL		

COAL CO.	MINE	PRODUCING DISTRICT	TYPE	TONS (000)	TRANSPORTATION USED			
PEAB	RKNG	BELLEVILLE	STRIP	5315	TRUCK	RAIL	BARGE	
PEAB	WSCR	SOUTHERN	STRIP	1344	RAIL	LAKE-VES		
PEAB	DYNO	SPRINGFIELD	DEEP	5722	TRUCK	RAIL	BARGE	
PEAB	UTIL	SOUTHERN	DEEP	518	RAIL			
PEAB	ALNO	FULTON-PEORIA	STRIP	574	TRUCK	RAIL	BARGE	
PEAB	BSTR	FULTON-PEORIA	STRIP	546	TRUCK	RAIL	BARGE	
PEAB	MDLG	FULTON-PEORIA	STRIP	1382	TRUCK	RAIL	BARGE	
PEAB	ENGY	SOUTHERN	STRIP	304	TRUCK	RAIL	LAKE-VES	
PEAB	MRST	W.KENTUCKY	STRIP	2353	BARGE			
PEAB	KBN	W.KENTUCKY	STR/DEEP	2826	RAIL	BARGE	LAKE-VES	
PEAB	RVDN	W.KENTUCKY	STR/DEEP	5341	RAIL	BARGE	LAKE-VES	
PEAB	RIVN	W.KENTUCKY	STRIP	1053	RAIL	LAKE-VES		
PEAB	SNCL	W.KENTUCKY	STRIP	4826	RAIL	OTHER		
PEAB	VOGE	W.KENTUCKY	STRIP	2711	RAIL	BARGE	LAKE-VES	
PEAB	CHFT	BRAZIL-CLINTON	STRIP	476	TRUCK	RAIL		
PEAB	HNTH	LINTON-SULLIVAN	STRIP	2429	TRUCK	RAIL		
PEAB	LYNV	PRINCETON-AYRSHR	STRIP	3385	TRUCK	RAIL	BARGE	LAKE-VES
PEAB	OLGL	LINTON-SULLIVAN	STRIP	601	TRUCK	RAIL	LAKE-VES	
PEAB	VICT	PRINCETON-AYRSHR	STRIP	896	TRUCK	RAIL	BARGE	
		PEAB COMPANY TOTAL TONS		47064				
PTHY	COLO	W.KENTUCKY	STRIP	2022	RAIL	BARGE	LAKE-VES	
PTHY	DEK6	W.KENTUCKY	DEEP	1547	BARGE			
PTHY	DEK9	W.KENTUCKY	DEEP	1390	BARGE			
PTHY	PARA	W.KENTUCKY	STRIP	2092	RAIL	BARGE	LAKE-VES	
		PTHY COMPANY TOTAL TONS		7051				
PYRO	PYRO	W.KENTUCKY	DEEP	1104	RAIL			

COAL CO.	MINE	PRODUCING DISTRICT	TYPE	TONS (000)	TRANSPORTATION USED		
		PYRO COMPANY TOTAL TONS		1104			
RSEK	NO1	LINTON-SULLIVAN	DEEP	114	TRUCK	RAIL	
		RSEK COMPANY TOTAL TONS		114			
RIAL	JEFF	W.KENTUCKY	STR/DEEP	454	TRUCK	RAIL	
		RIAL COMPANY TOTAL TONS		454			
RUSB	LTL.J	W.KENTUCKY	STRIP	349	RAIL		
		RUSB COMPANY TOTAL TONS		349			
SAHA	9 10	SOUTHERN	DEEP	1688	RAIL	BARGE	LAKE-VES
SAHA	NO6	SOUTHERN	STRIP	1120	RAIL	BARGE	LAKE-VES
		SAHA COMPANY TOTAL TONS		2808			
SHTP	PION	MINERAL-ATKINSON	STRIP	117	TRUCK		
		SHTP COMPANY TOTAL TONS		117			
SNIL	CAPT	BELLEVILLE	STRIP	5787		RAIL	
SNIL	STRL	BELLEVILLE	STRIP	1533	TRUCK	RAIL	
		SNIL COMPANY TOTAL TONS		7320			
TABB	LKVW	W.KENTUCKY	STRIP	567	RAIL		
		TABB COMPANY TOTAL TONS		567			
VDAY	VDAY	DANVILLE	DEEP	48	TRUCK	RAIL	
		VDAY COMPANY TOTAL TONS		48			
VEND	VEND	BELLEVILLE	DEEP	33	TRUCK		
		VEND COMPANY TOTAL TONS		33			
WEBT	BOYI	W.KENTUCKY	DEEP	406	RAIL		
		WEBT COMPANY TOTAL TONS		406			
WICR	SNRK	W.KENTUCKY	STRIP	637	RAIL		
		WICR COMPANY TOTAL TONS		637			
WESK	WESK	W.KENTUCKY	STRIP	151	RAIL		

COAL CO.	MINE	PRODUCING DISTRICT	TYPE	TONS (000)	TRANSPORTATION USED			
		HESK COMPANY TOTAL TONS		151				
FREE	CRWN	SPRINGFIELD	DEEP	2380	TRUCK	RAIL	BARGE	
FREE	OR13	SOUTHERN	DEEP	2991	TRUCK	RAIL	BARGE	LAKE-VES
FREE	OR14	SOUTHERN	DEEP	1387	TRUCK	RAIL	BARGE	LAKE-VES
FREE	OR15	SOUTHERN	DEEP	1669	RAIL	BARGE	LAKE-VES	
		FREE COMPANY TOTAL TONS		8427				
UEC	BK17	FULTON-PEORIA	STRIP	1904	RAIL	BARGE		
UEC	CUBA	FULTON-PEORIA	STRIP	974	RAIL	BARGE		
UEC	BR27	FULTON-PEORIA	STRIP	834	TRUCK	BARGE		
UEC	FIDL	BELLEVILLE	STRIP	2030	TRUCK	RAIL	BARGE	LAKE-VES
		UEC COMPANY TOTAL TONS		5742				
		ALL COMPANIES TOTAL TONS		125676				

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
STRIP MINES

SET P-1 REPORT 8

COAL	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
AYRS	CHNK	3	15-1 THRU 19-1	67	120	84	1147	BRAZIL-CLINTON
AYRS	OLTA	6	LESS THAN 15-1	63	90	59	976	SOUTHERN
AYRS	HARN	7	15-1 THRU 19-1	71	120	99	627	DANVILLE
AYRS	HINH	6	20-1 THRU 24-1	62	120	93	1424	LINTON-SULLIVAN
AYRS	HINH	7	20-1 THRU 24-1	36	65	52	0	LINTON-SULLIVAN
AYRS	SUNS	2	30-1 OR MORE	28	80	57	821	FULTON-PEORIA
AYRS	MRIT	5	LESS THAN 15-1	49	80	47	1285	PRINCETON-AYRSHR
			AYRS COMPANY TOTAL TONS				6480	
SBMN	EBNY	9	LESS THAN 15-1	50	65	40	360	W.KENTUCKY
SBMN	NO2	9	LESS THAN 15-1	50	65	40	304	W.KENTUCKY
			SBMN COMPANY TOTAL TONS				664	
SKTN	SKTN	9	LESS THAN 15-1	55	85	60	107	W.KENTUCKY
			SKTN COMPANY TOTAL TONS				107	
SRGE	SRGE	9	LESS THAN 15-1	48	75	43	122	W.KENTUCKY
			SRGE COMPANY TOTAL TONS				122	
TXTR	BST2	6	LESS THAN 15-1	66	70	60	1500	BELLEVILLE
TXTR	BST3	5	LESS THAN 15-1	40	60	40	1483	BELLEVILLE
TXTR	BST3	6	LESS THAN 15-1	55	60	40	0	BELLEVILLE
TXTR	FIAT	5	15-1 THRU 19-1	58	102	68	1523	FULTON-PEORIA
TXTR	LSIS	5	LESS THAN 15-1	55	92	60	917	FULTON-PEORIA
			TXTR COMPANY TOTAL TONS				5623	
DRKS	BOOH	9	LESS THAN 15-1	54	50	30	418	W.KENTUCKY
			DRKS COMPANY TOTAL TONS				418	
GBAL	GBAL	11	LESS THAN 15-1	47	100	11	2036	W.KENTUCKY

COAL	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
GBRL	GBRL	12	LESS THAN 15-1	40	100	90	0	W.KENTUCKY
GBRL	GBRL	13	15-1 THRU 19-1	36	100	39	0	W.KENTUCKY
			GBRL COMPANY TOTAL TONS				2036	
GREN	PNOR	9	15-1 THRU 19-1	46	125	70	1066	W.KENTUCKY
			GREN COMPANY TOTAL TONS				1066	
HSTN	HSTN	6	LESS THAN 15-1	58	30	25	15	SOUTHERN
			HSTN COMPANY TOTAL TONS				15	
ISCK	PLSV	9	LESS THAN 15-1	60	80	55	567	W.KENTUCKY
			ISCK COMPANY TOTAL TONS				567	
JOLR	JOLR	20	LESS THAN 15-1	48	85	60	89	SOUTHERN
			JOLR COMPANY TOTAL TONS				89	
KIRK	CANY	9	LESS THAN 15-1	60	110	75	870	W.KENTUCKY
KIRK	CANY	11	LESS THAN 15-1	72	110	75	0	W.KENTUCKY
KIRK	CANY	12	LESS THAN 15-1	66	110	75	0	W.KENTUCKY
WRIT	WRIT	9	LESS THAN 15-1	60	85	60	521	W.KENTUCKY
WRIT	WRIT	11	LESS THAN 15-1	72	85	60	0	W.KENTUCKY
WRIT	WRIT	12	LESS THAN 15-1	66	85	60	0	W.KENTUCKY
			KIRK COMPANY TOTAL TONS				1391	
MORS	MATN	6	LESS THAN 15-1	30	60	30	58	W.KENTUCKY
			MORS COMPANY TOTAL TONS				58	
OLDB	BLKF	5	LESS THAN 15-1	48	90	60	1458	PRINCETON-AYRSHR
OLDB	BLKF	5A	LESS THAN 15-1	23	90	60	0	PRINCETON-AYRSHR
OLDB	BNDS	5	15-1 THRU 19-1	47	104	66	1675	PRINCETON-AYRSHR
			OLDB COMPANY TOTAL TONS				3133	
PEAB	EDWD	6	LESS THAN 15-1	66	66	62	537	FULTON-PEORIA
PEAB	NECO	6	15-1 THRU 19-1	66	51	66	1248	MINERAL-ATKINSON
PEAB	NRTH	2	25-1 THRU 29-1	36	85	73	795	NORTHERN
PEAB	NRTH	7	25-1 THRU 29-1	36	85	73	0	NORTHERN
PEAB	RENS	6	LESS THAN 15-1	76	75	55	5319	BELLEVILLE

COAL	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
PEAB	WSCR	20	19-1 THRU 19-1	36	69	65	1344	SOUTHERN
PEAB	ALMO	6	LESS THAN 19-1	0	0	0	574	FULTON-PEORIA
PEAB	BSTR	5	19-1 THRU 19-1	53	57	47	946	FULTON-PEORIA
PEAB	BSTR	6	19-1 THRU 19-1	53	57	47	0	FULTON-PEORIA
PEAB	HDLG	5	20-1 THRU 24-1	46	71	60	1382	FULTON-PEORIA
PEAB	HDLG	6	20-1 THRU 24-1	46	71	60	0	FULTON-PEORIA
PEAB	ENGY	6	LESS THAN 19-1	0	0	0	504	SOUTHERN
PEAB	HRST	9	LESS THAN 19-1	52	139	110	2353	W.KENTUCKY
PEAB	HRST	11	LESS THAN 19-1	52	139	110	0	W.KENTUCKY
PEAB	HRST	13	LESS THAN 19-1	52	139	110	0	W.KENTUCKY
PEAB	RIVU	11	LESS THAN 19-1	5	80	55	1053	W.KENTUCKY
PEAB	RIVU	14	LESS THAN 19-1	5	80	55	0	W.KENTUCKY
PEAB	SNCL	9	LESS THAN 19-1	64	70	65	4826	W.KENTUCKY
PEAB	SNCL	11	LESS THAN 19-1	64	70	65	0	W.KENTUCKY
PEAB	SNCL	12	LESS THAN 19-1	64	70	65	0	W.KENTUCKY
PEAB	VOGE	11	LESS THAN 19-1	66	56	50	2711	W.KENTUCKY
PEAB	VOGE	12	LESS THAN 19-1	66	56	50	0	W.KENTUCKY
PEAB	CNFT	7	20-1 THRU 24-1	32	63	61	476	BRAZIL-CLINTON
PEAB	HUTH	5	LESS THAN 19-1	24	42	35	2429	LINTON-SULLIVAN
PEAB	LYNV	6	LESS THAN 19-1	60	50	45	3385	PRINCETON-AYRSHR
PEAB	OLGL	30	19-1 THRU 19-1	30	63	43	601	LINTON-SULLIVAN
PEAB	VICT	5	19-1 THRU 19-1	42	58	55	896	PRINCETON-AYRSHR
				PEAB COMPANY TOTAL TONS			30935	
PTNY	COLO	9	LESS THAN 19-1	60	145	71	2022	W.KENTUCKY
PTNY	COLO	11	LESS THAN 19-1	72	145	71	0	W.KENTUCKY
PTNY	COLO	12	LESS THAN 19-1	54	145	71	0	W.KENTUCKY
PTNY	COLO	14	LESS THAN 19-1	96	145	71	0	W.KENTUCKY
PTNY	PARA	9	LESS THAN 19-1	56	120	60	2092	W.KENTUCKY
PTNY	PARA	11	LESS THAN 19-1	72	120	60	0	W.KENTUCKY
PTNY	PARA	12	LESS THAN 19-1	72	120	60	0	W.KENTUCKY
PTNY	PARA	13	LESS THAN 19-1	36	120	60	0	W.KENTUCKY
				PTNY COMPANY TOTAL TONS			4114	
RUSS	LTLJ	9	LESS THAN 19-1	50	55	35	369	W.KENTUCKY

COAL	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
			RUSB COMPANY TOTAL TONS				369	
SANA	NO6	6	15-1 THRU 19-1	54	70	55	1120	SOUTHERN
			SANA COMPANY TOTAL TONS				1120	
SHTP	PION	6	15-1 THRU 19-1	40	45	39	117	MINERAL-ATKINSON
			SHTP COMPANY TOTAL TONS				117	
SNIL	CAPT	5	LESS THAN 15-1	99	90	82	5787	BELLEVILLE
SNIL	CAPT	6	LESS THAN 15-1	99	90	82	0	BELLEVILLE
SNIL	STAL	6	LESS THAN 15-1	71	71	60	1533	BELLEVILLE
			SNIL COMPANY TOTAL TONS				7320	
TABB	LKVW	11	LESS THAN 15-1	60	50	30	567	W.KENTUCKY
TABB	LKVW	09	LESS THAN 15-1	92	50	30	0	W.KENTUCKY
			TABB COMPANY TOTAL TONS				567	
WICR	SHRK	11	LESS THAN 15-1	72	85	60	637	W.KENTUCKY
WICR	SHRK	14	LESS THAN 15-1	96	85	60	0	W.KENTUCKY
			WICR COMPANY TOTAL TONS				637	
WESK	WESK	9	LESS THAN 15-1	60	60	40	151	W.KENTUCKY
			WESK COMPANY TOTAL TONS				151	
UEC	BK17	5	LESS THAN 15-1	57	85	61	1904	FULTON-PEORIA
UEC	CUBA	5	LESS THAN 15-1	52	56	47	974	FULTON-PEORIA
UEC	BR27	2	LESS THAN 15-1	28	80	28	834	FULTON-PEORIA
UEC	FIDL	6	LESS THAN 15-1	75	80	59	2030	BELLEVILLE
			UEC COMPANY TOTAL TONS				5742	
			ALL COMPANIES TOTAL TONS				72841	

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
DEEP MINES

SET P-1 REPORT C

COAL CO.	MINE	PRODUCING DISTRICT	DEPTH (FEET)	TONS (000)
AYRS	THUN	LINTON-SULLIVAN	307	1229
		AYRS COMPANY TOTAL TONS		1229
BAKY	BAKY	SOUTHERN	150	112
		BAKY COMPANY TOTAL TONS		112
BLVY	BLVY	BELLEVILLE	100	104
		BLVY COMPANY TOTAL TONS		104
BLGZ	HRDK	HURDOCK	210	747
BLGZ	ZGL4	SOUTHERN	325	1271
BLGZ	ZGL9	W.KENTUCKY	345	535
BLGZ	ORIL	W.KENTUCKY	240	636
BLGZ	SPRT	BELLEVILLE	255	882
		BLGZ COMPANY TOTAL TONS		4069
BLSO	TRNR	SOUTHERN	120	103
		BLSO COMPANY TOTAL TONS		103
TXTR	HILS	SPRINGFIELD	500	1169
		TXTR COMPANY TOTAL TONS		1169
DCLA	DCLA	W.KENTUCKY	225	102
		DCLA COMPANY TOTAL TONS		102
HRBG	HRBG	SOUTHERN	60	89
		HRBG COMPANY TOTAL TONS		89
ISCK	EDIA	W.KENTUCKY	275	2373
ISCK	PIES	W.KENTUCKY	250	1442
ISCK	CAES	W.KENTUCKY	200	1051

COAL CO.	MINE	PRODUCING DISTRICT	DEPTH (FEET)	TONS (000)
ISCK	UNTN	W.KENTUCKY	350	1473
ISCK	ATKN	W.KENTUCKY	200	1470
ISCK	WILS	W.KENTUCKY	150	231
		ISCK COMPANY TOTAL TONS		8040
OLDB	KING	PRINCETON-AYRSHR	450	335
OLDB	NO21	SOUTHERN	656	2240
OLDB	NO24	SOUTHERN	666	2368
OLDB	NO8	SOUTHERN	482	1391
		OLDB COMPANY TOTAL TONS		6334
PRTN	PRTN	SOUTHERN	175	66
		PRTN COMPANY TOTAL TONS		66
PEAB	DYNO	SPRINGFIELD	404	5722
PEAB	UTIL	SOUTHERN	93	518
		PEAB COMPANY TOTAL TONS		6240
PTNY	DEK6	W.KENTUCKY	500	1547
PTNY	DEK9	W.KENTUCKY	800	1390
		PTNY COMPANY TOTAL TONS		2937
PYRO	PYRO	W.KENTUCKY	100	1104
		PYRO COMPANY TOTAL TONS		1104
RS&K	NO1	LINTON-SULLIVAN	160	114
		RS&K COMPANY TOTAL TONS		114
SAHA	S 16	SOUTHERN	175	1688
		SAHA COMPANY TOTAL TONS		1688
VDAY	VDAY	DANVILLE	135	48
		VDAY COMPANY TOTAL TONS		48
VEND	VEND	BELLEVILLE	260	33

COAL CO.	MINE	PRODUCING DISTRICT	DEPTH (FEET)	TONS (000)
		VEND COMPANY TOTAL TONS		33
WEBT	DOTI	W.KENTUCKY	300	406
		WEBT COMPANY TOTAL TONS		406
FREE	CRNN	SPRINGFIELD	354	2380
FREE	ORI3	SOUTHERN	800	2991
FREE	ORI4	SOUTHERN	275	1387
FREE	ORI5	SOUTHERN	612	1669
		FREE COMPANY TOTAL TONS		8427
		ALL COMPANIES TOTAL TONS		42492

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
STRIP-DEEP MINES

SET P-1 REPORT D

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
PEAB	EAGL	5	LESS THAN 15-1	41	149	57	45	309	SOUTHERN
PEAB	EAGL	6	LESS THAN 15-1	41	149	57	45	0	SOUTHERN
PEAB	MNST	6	LESS THAN 15-1	84	68	53	47	1413	BELLEVILLE
PEAB	KEN	9	LESS THAN 15-1	54	90	93	69	2826	W.KENTUCKY
PEAB	KEN	11	LESS THAN 15-1	54	90	93	69	0	W.KENTUCKY
PEAB	RVQN	9	LESS THAN 15-1	60	142	64	52	5341	W.KENTUCKY
PEAB	RVQN	11	LESS THAN 15-1	60	142	64	52	0	W.KENTUCKY
PEAB	RVQN	12	LESS THAN 15-1	60	142	64	52	0	W.KENTUCKY
				PEAB COMPANY TOTAL TONS				9889	
RIAL	JIFF	6	LESS THAN 15-1	42	100	95	60	454	W.KENTUCKY
				RIAL COMPANY TOTAL TONS				454	
				ALL COMPANIES TOTAL TONS				10343	

PRODUCER DATA EXHIBITS

DX 50

Comparison of Leading Producers with Other Producers: Mine Size and Characteristics

KIRKLAND ELLIS.
U.S VS GENERAL DYNAMICS
BY LEADING

SET P-1 REPORT P1

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	RATIO	WES	DRY	TX	AR	VOL	UNIT	OGE	TOTAL TONS (000)	ORGT	AGNT	WHL	RET	OTH	PRODUCING DISTRICT
AYRS	CHNK	3	STRIP	67	0	120	84	2	X	X	X	X				1147	11	0	0	0	0	BRAZIL-CLINTON
AYRS	DLTA	6	STRIP	63	0	90	59	1	X	X		X				976	11	0	0	0	0	SOUTHERN
AYRS	HARN	7	STRIP	71	0	120	99	2	X	X	X	X				627	11	0	0	0	0	DANVILLE
AYRS	MINN	6	STRIP	62	0	120	93	3	X	X	X	X				1624	11	0	0	0	0	LINTON-SULLIVAN
AYRS	MINN	7	STRIP	38	0	65	52	3	X	X	X	X				0	11	0	0	0	0	LINTON-SULLIVAN
AYRS	SUNS	2	STRIP	28	0	80	57	5	X	X	X	X			X	821	11	0	0	0	0	FULTON-PEORIA
AYRS	THUN	5	DEEP	66	307	0	0	0	X	X		X				1229	11	0	0	0	0	LINTON-SULLIVAN
AYRS	WHIT	5	STRIP	49	0	80	47	1				X			X	1265	11	0	0	0	0	PRINCETON-AYRSHR
								AYRS COMPANY TOTAL TONS								7709						
BLEZ	MROK	7	DEEP	84	210	0	0	0	X	X	X	X	X			747	10	0	1	1	0	MURDOCK
BLEZ	ZGL4	6	DEEP	96	325	0	0	0	X	X	X	X	X		X	1271	9	0	1	2	0	SOUTHERN
BLEZ	ZGL9	9	DEEP	72	345	0	0	0				X		X	X	533	11	0	0	0	0	W.KENTUCKY
BLEZ	ORIL	11	DEEP	72	240	0	0	0	X	X	X	X	X		X	636	7	0	3	2	0	W.KENTUCKY
BLEZ	SPRY	6	DEEP	76	235	0	0	0	X	X	X	X	X		X	802	10	0	2	0	0	BELLEVILLE
								BLEZ COMPANY TOTAL TONS								4064						
TXTR	HST2	6	STRIP	66	0	70	60	1	X	X		X	X	X		1500	10	0	1	0	0	BELLEVILLE
TXTR	HST3	5	STRIP	40	0	60	40	1	X	X		X		X		1683	11	0	0	0	0	BELLEVILLE
TXTR	HST3	6	STRIP	55	0	60	40	1	X	X		X		X		0	11	0	0	0	0	BELLEVILLE
TXTR	PIAT	5	STRIP	58	0	E02	60	2	X	X	X	X				1523	11	0	0	0	0	FULTON-PEORIA
TXTR	WILS	6	DEEP	75	500	0	0	0	X							1149	11	0	0	0	0	SPRINGFIELD
TXTR	LSIS	5	STRIP	55	0	92	60	1	X	X	X	X				917	10	0	1	1	0	FULTON-PEORIA
								TXTR COMPANY TOTAL TONS								6792						
GBRL	GBRL	11	STRIP	47	0	100	11	1	X	X					X	2036	11	0	0	0	0	W.KENTUCKY
GBRL	GBRL	12	STRIP	60	0	100	50	1	X	X					X	0	11	0	0	0	0	W.KENTUCKY
GBRL	GBRL	13	STRIP	36	0	100	39	2	X	X					X	0	11	0	0	0	0	W.KENTUCKY

411

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	AATLO	MES	DRY	TK	AR	VOL	UNIT	BGE	TOTAL TONS (000)	DRCT	AGNT	MNL	REY	OTH	PRODUCING DISTRICT
									GORL COMPANY TOTAL TONS							2036						
ISCK	EDIA	9	DEEP	62	275	0	0	0	X		X	X	X	X		2373	11	0	0	0	0	W.KENTUCKY
ISCK	FIES	11	DEEP	66	250	0	0	0	X	X	X	X	X	X		1442	8	0	0	3	0	W.KENTUCKY
ISCK	CRES	11	DEEP	62	200	0	0	0	X	X	X	X	X	X		1051	9	0	0	2	0	W.KENTUCKY
ISCK	UNTN	9	DEEP	62	350	0	0	0	X	X					X	1473	11	0	0	0	0	W.KENTUCKY
ISCK	ATKN	9	DEEP	60	200	0	0	0				X				1470	9	0	2	0	0	W.KENTUCKY
ISCK	WELS	6	DEEP	45	150	0	0	0	X		X	X	X			231	4	0	0	7	0	W.KENTUCKY
ISCK	PLSV	9	STRIP	60	0	60	55	1				X	X	X		567	11	0	0	0	0	W.KENTUCKY
									ISCK COMPANY TOTAL TONS							6607						
OLDB	BLKP	5	STRIP	48	0	90	48	1	X	X	X	X	X			1456	0	11	0	0	0	PRINCETON-AYRSHR
OLDB	BLKP	5A	STRIP	23	0	90	48	1	X	X	X	X	X			0	0	11	0	0	0	PRINCETON-AYRSHR
OLDB	ENOS	5	STRIP	47	0	104	66	2	X	X		X	X	X		1675	0	11	0	0	0	PRINCETON-AYRSHR
OLDB	KING	5	DEEP	75	450	0	0	0	X	X	X	X	X			335	0	11	0	0	0	PRINCETON-AYRSHR
OLDB	NO2I	6	DEEP	99	656	0	0	0	X	X		X				2240	9	0	2	1	0	SOUTHERN
OLDB	NO2A	6	DEEP	99	666	0	0	0				X		X		2366	11	0	0	0	0	SOUTHERN
OLDB	NOV	6	DEEP	99	462	0	0	0	X	X	X	X				1391	10	0	0	1	0	SOUTHERN
									OLDB COMPANY TOTAL TONS							9467						
PEAB	EAGL	5	STR/DEEP	41	149	57	45	1	X	X					X	309	11	0	0	0	0	SOUTHERN
PEAB	EAGL	6	STR/DEEP	41	149	57	45	1	X	X					X	0	11	0	0	0	0	SOUTHERN
PEAB	EDNO	6	STRIP	44	0	44	42	1	X	X	X	X				537	8	0	1	3	0	FULTON-PEORIA
PEAB	HECO	6	STRIP	46	0	51	44	2	X	X	X	X	X			1248	10	0	0	1	0	MINERAL-ATKINSON
PEAB	MUST	6	STR/DEEP	84	68	53	47	1	X	X	X					1413	10	0	0	1	0	BELLEVILLE
PEAB	NRTH	3	STRIP	36	0	85	73	4	X	X	X	X	X			736	10	0	0	1	0	NORTHERN
PEAB	NRTH	7	STRIP	36	0	85	73	4	X	X	X	X	X			0	10	0	0	1	0	NORTHERN
PEAB	RKNG	6	STRIP	76	0	75	55	1	X	X	X	X	X			9319	10	0	1	1	0	BELLEVILLE
PEAB	WSCR	20	STRIP	36	0	49	40	2	X	X		X	X	X		1344	10	0	1	0	0	SOUTHERN

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	RATIO	MGS	DRY	TK	RR	VOL	UNIT	BGE	TOTAL TONS (000)	DACT	AGNT	WHL	RET	OTH	PRODUCING DISTRICT
PEAB	BYNO	6	DEEP	84	404	0	0	0	X	X	X	X				5722	10	0	0	0	0	SPRINGFIELD
PEAB	UTIL	6	DEEP	76	93	0	0	0	X	X		X				518	8	0	2	2	0	SOUTHERN
PEAB	ALNO	6	STRIP	0	0	0	0	0	X	X	X	X	X			574	0	0	0	0	0	FULTON-PEORIA
PEAB	BSTR	5	STRIP	53	0	57	47	2	X	X	X	X	X			546	6	0	3	1	0	FULTON-PEORIA
PEAB	BSTR	6	STRIP	53	0	57	47	2	X	X	X	X	X			0	6	0	3	1	0	FULTON-PEORIA
PEAB	HOLG	5	STRIP	46	0	71	60	3	X	X	X	X	X	X		1362	10	0	1	1	0	FULTON-PEORIA
PEAB	HOLG	6	STRIP	46	0	71	60	3	X	X	X	X	X	X		0	10	0	1	1	0	FULTON-PEORIA
PEAB	ENGY	6	STRIP	0	0	0	0	0	X	X	X	X	X			504	0	0	0	0	0	SOUTHERN
PEAB	HKST	9	STRIP	52	0	139	110	1							X	2353	11	0	0	0	0	W.KENTUCKY
PEAB	HKST	11	STRIP	52	0	139	110	1							X	0	11	0	0	0	0	W.KENTUCKY
PEAB	HKST	13	STRIP	52	0	139	110	1							X	0	11	0	0	0	0	W.KENTUCKY
PEAB	KEN	9	STR/DEEP	54	90	93	69	1	X	X		X	X		X	2826	9	0	1	1	0	W.KENTUCKY
PEAB	KEN	11	STR/DEEP	54	90	93	69	1	X	X		X	X		X	0	9	0	1	1	0	W.KENTUCKY
PEAB	RVGN	9	STR/DEEP	60	142	64	52	1	X	X		X	X		X	5341	11	0	0	0	0	W.KENTUCKY
PEAB	RVGN	11	STR/DEEP	60	142	64	52	1	X	X		X	X		X	0	11	0	0	0	0	W.KENTUCKY
PEAB	RVGN	12	STR/DEEP	60	142	64	52	1	X	X		X	X		X	0	11	0	0	0	0	W.KENTUCKY
PEAB	RIVV	11	STRIP	5	0	80	55	1	X	X		X	X			1053	10	0	0	1	0	W.KENTUCKY
PEAB	RIVV	14	STRIP	5	0	80	55	1	X	X		X	X			0	10	0	0	1	0	W.KENTUCKY
PEAB	SNCL	9	STRIP	64	0	70	65	1				X				4826	11	0	0	0	0	W.KENTUCKY
PEAB	SNCL	11	STRIP	64	0	70	65	1				X				0	11	0	0	0	0	W.KENTUCKY
PEAB	SNCL	12	STRIP	64	0	70	65	1				X				0	11	0	0	0	0	W.KENTUCKY
PEAB	VOGE	11	STRIP	66	0	56	50	1	X	X		X	X			2711	9	0	2	1	0	W.KENTUCKY
PEAB	VOGE	12	STRIP	66	0	56	50	1	X	X		X	X			0	9	0	2	1	0	W.KENTUCKY
PEAB	CHPT	7	STRIP	32	0	63	61	3	X	X	X	X				476	10	0	0	1	0	BRAZIL-CLINTON
PEAB	HWTH	5	STRIP	24	0	42	35	1	X	X	X	X	X			2429	10	0	1	0	0	LINTON-SULLIVAN
PEAB	LYNV	6	STRIP	60	0	50	45	1	X	X	X	X	X	X		3385	10	0	1	0	0	PRINCETON-AVRSHR
PEAB	OLGL	30	STRIP	30	0	63	43	2			X	X				601	9	0	0	2	0	LINTON-SULLIVAN
PEAB	VICT	5	STRIP	42	0	58	55	2	X	X	X	X				896	11	0	0	0	0	PRINCETON-AVRSHR
									PEAB		COMPANY	TOTAL	TONS			47864						
PINY	COLG	9	STRIP	60	0	145	71	1	X	X		X				2022	11	0	0	0	0	W.KENTUCKY

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	RATIO	WES	DRY	TK	AR	VOL	UNIT	BGE	TOTAL TONS (000)	ORCT	AGNT	WHL	RET	OTH	PRODUCING DISTRICT
PTHY	COLO	11	STRIP	72	0	145	71	1	X	X		X				0	11	0	0	0	0	W.KENTUCKY
PTHY	COLO	12	STRIP	54	0	145	71	1	X	X		X				0	11	0	0	0	0	W.KENTUCKY
PTHY	COLO	14	STRIP	96	0	145	71	1	X	X		X				0	11	0	0	0	0	W.KENTUCKY
PTHY	DEK6	6	DEEP	50	500	0	0	0	X													W.KENTUCKY
PTHY	DEK9	9	DEEP	60	800	0	0	0	X						X	1547	11	0	0	0	0	W.KENTUCKY
PTHY	PARA	9	STRIP	56	0	120	60	1	X			X	X		X	1390	11	0	0	0	0	W.KENTUCKY
PTHY	PARA	11	STRIP	72	0	120	60	1	X			X	X		X	2092	11	0	0	0	0	W.KENTUCKY
PTHY	PARA	12	STRIP	72	0	120	60	1	X			X	X		X	0	11	0	0	0	0	W.KENTUCKY
PTHY	PARA	13	STRIP	36	0	120	60	1	X			X	X		X	0	11	0	0	0	0	W.KENTUCKY
															X	0	11	0	0	0	0	W.KENTUCKY
								PTHY COMPANY TOTAL TONS								7051					
SAHA	9 16	5	DEEP	66	175	0	0	0	X	X		X	X			1688	8	0	1	3	0	SOUTHERN
SAHA	NO6	6	STRIP	54	0	70	55	2	X	X		X	X			1120	9	0	2	1	0	SOUTHERN
								SAHA COMPANY TOTAL TONS								2808					
SHIL	CAPT	5	STRIP	99	0	90	82	1	X	X		X		X		5787	0	11	0	0	0	BELLEVILLE
SHIL	CAPT	6	STRIP	99	0	90	82	1	X	X		X		X		0	0	11	0	0	0	BELLEVILLE
SHIL	STRL	6	STRIP	71	0	71	60	1	X	X	X	X		X		1533	0	11	0	0	0	BELLEVILLE
								SHIL COMPANY TOTAL TONS								7320					
FREE	CRWN	6	DEEP	84	354	0	0	0	X	X	X	X	X			2380	10	0	1	0	0	SPRINGFIELD
FREE	ORI3	6	DEEP	99	800	0	0	0	X	X	X	X	X			2991	9	0	2	1	0	SOUTHERN
FREE	ORI4	6	DEEP	79	275	0	0	0	X		X	X	X			1387	9	0	2	0	0	SOUTHERN
FREE	ORI5	6	DEEP	99	612	0	0	0	X	X		X	X			1669	9	0	1	1	0	SOUTHERN
								FREE COMPANY TOTAL TONS								8427					
UEC	BRLT	5	STRIP	57	0	85	61	1	X			X	X		X	1904	11	0	0	0	0	FULTON-PEORIA
UEC	CUBA	5	STRIP	52	0	56	47	1	X	X		X	X			974	9	0	2	0	0	FULTON-PEORIA
UEC	BR27	2	STRIP	28	0	80	28	1	X		X				X	834	10	0	0	1	0	FULTON-PEORIA
UEC	FIDL	6	STRIP	75	0	80	59	1	X	X	X	X	X	X	X	2030	9	0	1	1	0	BELLEVILLE
								UEC COMPANY TOTAL TONS								5742					
								ALL COMPANIES TOTAL TONS								117092					

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
OTHER

SET P=1 REPORT F2

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	RATIO	WES	DRY	TK	KR	VOL	UNIT	BOE	TOTAL TONS (000)	ORCT	AGNT	WHL	RET	OTH	PRODUCING DISTRICT
BRKY	BRKY	5	DEEP	52	150	0	0	0	X		X					112	10	1	0	0	0	SOUTHERN
										BRKY COMPANY TOTAL TONS						112						
BSNN	BSNY	9	STRIP	50	0	65	40	1								360	0	0	0	0	11	W.KENTUCKY
BSNN	NO2	9	STRIP	50	0	65	40	1								304	0	0	0	0	11	W.KENTUCKY
										BSNN COMPANY TOTAL TONS						664						
BLVY	BLVY	6	DEEP	84	100	0	0	0	X		X	X				106	4	0	0	7	0	BELLEVILLE
										BLVY COMPANY TOTAL TONS						106						
BKTH	BKTH	9	STRIP	55	0	85	60	1				X				107	0	11	0	0	0	W.KENTUCKY
										BKTH COMPANY TOTAL TONS						107						
BLBO	TRNR	5	DEEP	50	120	0	0	0				X	X			183	0	11	0	0	0	SOUTHERN
										BLBO COMPANY TOTAL TONS						183						
BAGE	BAGE	9	STRIP	48	0	75	45	1				X	X			122	10	0	0	1	0	W.KENTUCKY
										BAGE COMPANY TOTAL TONS						122						
DRKS	BOON	9	STRIP	54	0	90	30	1				X				418	0	0	0	0	11	W.KENTUCKY
										DRKS COMPANY TOTAL TONS						418						
DCLA	DCLA	9	DEEP	60	225	0	0	0				X				102	0	9	0	2	0	W.KENTUCKY
										DCLA COMPANY TOTAL TONS						102						
GREN	PINR	9	STRIP	46	0	125	70	2	X		X	X			X	1066	10	0	1	0	0	W.KENTUCKY
										GREN COMPANY TOTAL TONS						1066						
HRBG	HRBG	5	DEEP	50	60	0	0	0	X			X				85	11	0	0	0	0	SOUTHERN
										HRBG COMPANY TOTAL TONS						85						
HSTN	HSTN	6	STRIP	50	0	30	25	1								15	0	11	0	0	0	SOUTHERN
										HSTN COMPANY TOTAL TONS						15						
JOLR	JOLR	20	STRIP	48	0	85	60	1								89	0	11	0	0	0	SOUTHERN

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	RATIO	WGS	ORY	TK	RR	VOL	UNIT	AGE	TOTAL TONS (000)	DRCT	AGNT	WHL	RET	OTH	PRODUCING DISTRICT
									JOLR COMPANY TOTAL TONS							89						
KIRK	CANY	9	STRIP	60	0	110	75	1	X	X	X	X	X									
KIRK	CANY	11	STRIP	72	0	110	75	1	X	X	X	X	X			870	0	11	0	0	0	W.KENTUCKY
KIRK	CANY	12	STRIP	66	0	110	75	1	X	X	X	X	X			0	0	11	0	0	0	W.KENTUCKY
																0	0	11	0	0	0	W.KENTUCKY
WRIT	WRIT	9	STRIP	60	0	85	60	1	X			X	X	X								
WRIT	WRIT	11	STRIP	72	0	85	60	1	X			X	X	X		921	0	11	0	0	0	W.KENTUCKY
WRIT	WRIT	12	STRIP	66	0	85	60	1	X			X	X	X		0	0	11	0	0	0	W.KENTUCKY
																0	0	11	0	0	0	W.KENTUCKY
									KIRK COMPANY TOTAL TONS							1391						
MORS	MRTN	6	STRIP	30	0	60	30	1	X				X	X								
																58	0	11	0	0	0	W.KENTUCKY
									MORS COMPANY TOTAL TONS							58						
PRTN	PRTN	5	DEEP	52	175	0	0	0	X				X									
																66	10	0	1	0	0	SOUTHERN
									PRTN COMPANY TOTAL TONS							66						
PYRO	PYRO	9	DEEP	55	100	0	0	0					X									
																1104	0	11	0	0	0	W.KENTUCKY
									PYRO COMPANY TOTAL TONS							1104						
RSEK	NOI	6	DEEP	66	160	0	0	0					X									
																114	3	9	0	0	0	LINTON-SULLIVAN
									RSEK COMPANY TOTAL TONS							114						
RIAL	JIFF	6	STR/DEEP	42	100	95	60	1	X	X	X	X										
																454	6	6	0	0	0	W.KENTUCKY
									RIAL COMPANY TOTAL TONS							454						
RUSS	LTLJ	9	STRIP	58	0	55	35	1					X									
																369	11	0	0	0	0	W.KENTUCKY
									RUSS COMPANY TOTAL TONS							369						
SHTP	PION	6	STRIP	40	0	45	39	2	X	X	X											
																117	11	0	0	0	0	MINERAL-ATKINSON
									SHTP COMPANY TOTAL TONS							117						
TABB	LKVW	11	STRIP	60	0	50	30	1	X	X		X										
TABB	LKVW	09	STRIP	92	0	50	30	1	X	X		X				567	0	11	0	0	0	W.KENTUCKY
																0	0	11	0	0	0	W.KENTUCKY
									TABB COMPANY TOTAL TONS							567						
VDAY	VDAY	6	DEEP	72	155	0	0	0	X			X	X									
																48	10	1	0	0	0	DANVILLE
									VDAY COMPANY TOTAL TONS							48						
VEND	VEND	6	DEEP	93	260	0	0	0	X			X										
																33	9	0	0	2	0	BELLEVILLE

COAL CO.	MINE	SEAM NO.	TYPE	SEAM THICK (INCH)	DEPTH DEEP (FT)	MAX OB (FT)	AVE OB (FT)	RATIO	WES	DRY	TK	RR	VOL	UNIT	BGE	TOTAL TONS (000)	DRCT	AGNT	WHL	RET	OTH	PRODUCING DISTRICT
									VEND	COMPANY	TOTAL	TONS				33						
WEST	DOTE	9	DEEP	54	300	0	0	0			X		X			406	10	1	0	0	0	W.KENTUCKY
									WEST	COMPANY	TOTAL	TONS				406						
WICR	SHRK	11	STRIP	72	0	85	60	1	X	X		X				637	11	0	0	0	0	W.KENTUCKY
WICR	SHRK	14	STRIP	56	0	85	60	1	X	X		X				0	11	0	0	0	0	W.KENTUCKY
									WICR	COMPANY	TOTAL	TONS				637						
WESK	WESK	9	STRIP	60	0	60	40	1				X				151	11	0	0	0	0	W.KENTUCKY
									WESK	COMPANY	TOTAL	TONS				151						
									ALL	COMPANIES	TOTAL	TONS				8884						

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
SIZE OF MINES

SET P-1 REPORT 62

		1967 PRODUCTION-TONS (000)							
		GREATER THAN 5 MILLION	GREATER THAN 4 MILLION	GREATER THAN 3 MILLION	GREATER THAN 2 MILLION	GREATER THAN 1 MILLION	GREATER THAN 500,000	BALANCE	TOTAL
ALL MINES									
	NO. OF MINES	4	1	1	13	31	23	26	99
	TOTAL TONNAGE	22165	4026	3385	30851	43239	16048	5170	125476
STRIP MINES									
	NO. OF MINES	2	1	1	7	14	10	12	57
	TOTAL TONNAGE	11102	4026	3385	19673	22545	12724	2986	72841
DEEP MINES									
	NO. OF MINES	1	0	0	5	14	5	12	37
	TOTAL TONNAGE	5722	0	0	12352	19281	3316	1821	42492
STRIP/DEEP MINES									
	NO. OF MINES	1	0	0	1	1	0	2	5
	TOTAL TONNAGE	5341	0	0	2826	1413	0	763	10343
LEADING									
	NO. OF MINES	4	1	1	13	29	19	4	71
	TOTAL TONNAGE	22165	4026	3385	30851	41069	13445	1351	117092
OTHER									
	NO. OF MINES	0	0	0	0	2	4	22	28
	TOTAL TONNAGE	0	0	0	0	2170	2999	3819	8384

PRODUCER DATA EXHIBITS DX 51

Coal Characteristics by Producing Districts

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 1.

NORTHERN 01

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	0	0	0.0	0.0	0.0	0
WASHED	755	112	2.56	15.2	7.4	2077

TOTAL TONS RAW 0

TOTAL TONS WASHED 755

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 2.

MINERAL-ATKINSON 02

STRIP	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
RAW	0	0	0.0	0.0	0.0	0
WASHED	1365	104	2.36	19.6	6.7	2144

TOTAL TONS RAW 0

TOTAL TONS WASHED 1365

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 3.

FULTON-PEORIA 03

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	856	99	2.90	16.2	11.4	1970
WASHED	9156	107	2.66	17.2	22.2	2063

TOTAL TONS RAW 856

TOTAL TONS WASHED 9156

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 4.

SPRINGFIELD 04

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
DEEP						
RAW	1264	99	3.83	15.0	13.8	2100
WASHED	8007	102	3.76	15.1	14.9	2078

TOTAL TONS RAW 1264

TOTAL TONS WASHED 8007

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 5.

DANVILLE 05

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	0	0	0.0	0.0	0.0	0
WASHED	627	113	2.60	14.0	7.8	2060
DEEP						
RAW	0	0	0.0	0.0	0.0	0
WASHED	48	108	1.94	11.6	10.6	2100

TOTAL TONS RAW 0

TOTAL TONS WASHED 675

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 6.

MURDOCK 06

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
DEEP						
RAW	0	0	0.0	0.0	0.0	0
WASHED	747	118	1.92	11.2	7.3	2250

TOTAL TONS RAW 0

TOTAL TONS WASHED 747

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 7.

BELLEVILLE OT

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	2944	109	3.98	10.2	13.5	2199
WASHED	14904	112	3.29	10.9	10.4	2177
DEEP						
RAW	38	110	3.75	10.0	9.8	2036
WASHED	983	112	2.76	10.5	9.2	2131
STRIP/DEEP						
RAW	0	0	0.0	0.0	0.0	0
WASHED	1413	110	3.37	13.8	9.0	2135

TOTAL TONS RAW 2982

TOTAL TONS WASHED 17300

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 8.

SOUTHERN 09

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	104	117	4.07	5.4	14.1	2150
WASHED	3944	123	2.85	7.4	9.0	2168
DEEP						
RAW	3675	112	2.77	9.1	12.8	2181
WASHED	12294	119	1.61	9.5	8.2	2222
STRIP/DEEP						
RAW	309	111	4.12	6.1	16.7	2122
WASHED	0	0	0.0	0.0	0.0	0

TOTAL TONS RAW 4088

TOTAL TONS WASHED 16238

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 9.

BRAZIL-CLINTON 20

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	0	0	0.0	0.0	0.0	0
WASHED	1623	115	3.00	13.2	7.8	2249

TOTAL TONS RAW 0

TOTAL TONS WASHED 1623

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 10

LINTON-SULLIVAN 21

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	601	116	1.45	15.1	6.3	2391
WASHED	4053	112	2.62	13.9	8.8	2219
DEEP						
RAW	114	105	3.50	14.0	15.0	2000
WASHED	1229	113	3.40	13.4	9.1	2082

TOTAL TONS RAW 715

TOTAL TONS WASHED 5282

4428

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 11

PRINCETON-AYRSHIRE 22

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	2029	109	3.68	12.0	11.7	2087
WASHED	6670	113	3.05	12.2	9.3	2126
DEEP						
RAW	82	110	1.60	14.0	10.1	2150
WASHED	253	120	1.40	12.0	5.3	2185

TOTAL TONS RAW 2111

TOTAL TONS WASHED 6923

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-2A REPORT 12

W.KENTUCKY 30

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
STRIP						
RAW	10253	110	4.25	9.0	14.6	2191
WASHED	12957	116	2.94	10.6	8.9	2204
DEEP						
RAW	7967	117	3.77	6.7	13.1	2009
WASHED	5791	123	2.93	8.5	7.5	2056
STRIP/DEEP						
RAW	3186	115	3.93	9.6	10.7	2020
WASHED	5435	118	3.12	10.0	8.6	2063

TOTAL TONS RAW 21406

TOTAL TONS WASHED 24183

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 1.

NORTHERN 01

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	0	0	0.0	0.0	0.0	0
WASHED	93	110	2.52	16.5	7.2	2085
SIZE-4						
RAW	0	0	0.0	0.0	0.0	0
WASHED	619	112	2.57	15.0	7.5	2075
SIZE-5						
RAW	0	0	0.0	0.0	0.0	0
WASHED	43	113	2.51	15.0	6.8	2083

TOTAL TONS RAW 0

TOTAL TONS WASHED 755

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 2.

MINERAL-ATKINSON 02

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	0	0	0.0	0.0	0.0	0
WASHED	1	107	2.10	20.0	5.0	2050
SIZE-3						
RAW	0	0	0.0	0.0	0.0	0
WASHED	38	111	2.47	17.3	5.4	2150
SIZE-4						
RAW	0	0	0.0	0.0	0.0	0
WASHED	1315	104	2.36	19.7	6.7	2144
SIZE-5						
RAW	0	0	0.0	0.0	0.0	0
WASHED	11	105	2.44	18.9	6.7	2129

TOTAL TONS RAW 0

TOTAL TONS WASHED 1365

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 3.

FULTON-PEORIA 03

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	0	0	0.0	0.0	0.0	0
WASHED	95	112	2.75	15.4	7.4	2090
SIZE-3						
RAW	0	0	0.0	0.0	0.0	0
WASHED	263	116	3.07	13.9	5.9	2123
SIZE-4						
RAW	0	0	0.0	0.0	0.0	0
WASHED	8157	107	2.66	17.1	24.0	2061
SIZE-5						
RAW	856	99	2.90	16.2	11.4	1970
WASHED	641	104	2.49	19.6	7.5	2055

TOTAL TONS RAW 856

TOTAL TONS WASHED 9156

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 4.

SPRINGFIELD 04

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-1						
RAW	91	98	3.50	16.4	12.8	2100
WASHED	0	0	0.0	0.0	0.0	0
SIZE-3						
RAW	0	0	0.0	0.0	0.0	0
WASHED	160	106	3.30	13.9	9.9	2060
SIZE-4						
RAW	1169	99	3.86	14.9	13.9	2100
WASHED	2064	105	3.40	14.8	10.4	2133
SIZE-5						
RAW	4	107	3.90	14.0	10.1	2050
WASHED	5783	100	3.90	15.2	16.7	2059

TOTAL TONS RAW 1264
TOTAL TONS WASHED 8007

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 5.

DANVILLE 05

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-1						
RAW	0	0	0.0	0.0	0.0	0
WASHED	9	95	2.00	15.1	15.0	2100
SIZE-4						
RAW	0	0	0.0	0.0	0.0	0
WASHED	657	113	2.57	13.8	7.9	2062
SIZE-5						
RAW	0	0	0.0	0.0	0.0	0
WASHED	9	113	1.67	13.5	8.2	2100

TOTAL TONS RAW 0

TOTAL TONS WASHED 675

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 6.

MURDOCK 06

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-3						
RAW	0	0	0.0	0.0	0.0	0
WASHED	151	122	1.80	10.0	6.3	2250
SIZE-4						
RAW	0	0	0.0	0.0	0.0	0
WASHED	587	117	1.95	11.5	7.6	2250
SIZE-5						
RAW	0	0	0.0	0.0	0.0	0
WASHED	9	123	1.75	9.2	7.5	2250

TOTAL TONS RAW 0

TOTAL TONS WASHED 747

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 7.

BELLEVILLE 07

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	5	90	3.59	8.4	12.2	N.A.
WASHED	340	109	3.01	13.2	8.8	2147
SIZE-3						
RAW	10	113	3.77	10.2	9.4	2036
WASHED	59	114	2.70	9.1	8.9	2150
SIZE-4						
RAW	2959	109	3.98	10.2	13.9	2198
WASHED	16673	112	3.28	11.0	10.2	2172
SIZE-5						
RAW	12	113	3.77	10.2	9.4	2036
WASHED	228	112	3.19	11.9	9.1	2138

TOTAL TONS RAW 2982

TOTAL TONS WASHED 17300

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 8.

SOUTHERN 09

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-1						
RAW	775	109	2.07	10.6	11.3	2157
WASHED	637	113	1.53	10.7	10.6	2121
SIZE-2						
RAW	44	110	1.38	8.6	12.7	2286
WASHED	1211	115	1.93	9.8	10.1	2170
SIZE-3						
RAW	59	109	3.00	7.0	15.0	2010
WASHED	3774	116	1.59	9.8	8.3	2236
SIZE-4						
RAW	2667	113	3.12	8.7	13.5	2193
WASHED	8599	122	2.13	8.4	8.3	2209
SIZE-5						
RAW	543	114	3.17	7.1	14.9	2125
WASHED	2017	122	1.67	8.5	7.7	2179

TOTAL TONS RAW 4088

TOTAL TONS WASHED 16238

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 9.

BRAZIL-CLINTON 20

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	0	0	0.0	0.0	0.0	0
WASHED	71	108	1.10	17.0	8.2	2570
SIZE-4						
RAW	0	0	0.0	0.0	0.0	0
WASHED	1454	116	3.22	12.8	7.8	2213
SIZE-5						
RAW	0	0	0.0	0.0	0.0	0
WASHED	98	110	1.09	16.2	8.2	2560

TOTAL TONS RAW 0

TOTAL TONS WASHED 1623

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 10

LINTON-SULLIVAN 21

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	24	108	1.83	17.0	8.9	2325
WASHED	30	101	2.85	17.1	12.0	2350
SIZE-3						
RAW	92	105	3.50	14.0	19.0	2000
WASHED	0	0	0.0	0.0	0.0	0
SIZE-4						
RAW	466	116	1.43	15.1	6.2	2395
WASHED	5247	112	2.80	13.7	8.8	2186
SIZE-5						
RAW	133	117	1.46	14.7	5.9	2389
WASHED	5	111	2.76	14.4	9.0	2330
TOTAL TONS RAW		715				
TOTAL TONS WASHED		5282				

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 11

PRINCETON-AYRSHIRE 22

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	82	110	1.60	14.0	10.1	2150
WASHED	75	106	3.18	13.5	11.8	2070
SIZE-4						
RAW	2029	109	3.68	12.0	11.7	2087
WASHED	6277	113	2.99	12.3	9.2	2128
SIZE-5						
RAW	0	0	0.0	0.0	0.0	0
WASHED	571	117	3.02	11.0	8.2	2144

TOTAL TONS RAW 2111

TOTAL TONS WASHED 6923

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 12

W.KENTUCKY 30

	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SIZE-2						
RAW	82	108	2.66	12.3	12.4	2080
WASHED	732	115	3.02	11.3	9.4	2185
SIZE-3						
RAW	416	111	3.67	11.1	10.6	N.A.
WASHED	1328	122	2.67	6.9	8.3	2213
SIZE-4						
RAW	7928	115	4.08	7.7	13.1	2099
WASHED	19123	118	3.01	10.0	8.6	2164
SIZE-5						
RAW	12978	112	4.01	8.4	13.9	2110
WASHED	3000	120	2.91	9.4	7.7	2054

TOTAL TONS RAW 21404

TOTAL TONS WASHED 24183

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
COAL CHARACTERISTICS

SET P-28 REPORT 12

ALL DISTRICTS

TOTAL TONS RAW 33422

TOTAL TONS WASHED 92254

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
WASHED COAL CHARACTERISTICS

SET P-2C REPORT 1.

	MINES	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
NORTHERN 01	1	755	112	2.56	15.2	7.4	2077
MINERAL-ATKINSON 02	2	1365	104	2.36	19.6	6.7	2144
FULTON-PEORIA 03	10	9156	107	2.66	17.2	22.2	2063
SPRINGFIELD 04	2	8807	102	3.76	15.1	14.9	2078
DANVILLE 05	2	675	113	2.55	13.8	8.0	2063
MURDOCK 06	1	747	118	1.92	11.2	7.3	2250
BELLEVILLE 07	9	17300	112	3.27	11.1	10.2	2171
SOUTHERN 09	16	16238	120	1.94	8.9	8.4	2208
BRAZIL-CLINTON 20	2	1623	115	3.00	13.2	7.8	2249
LINTON-SULLIVAN 21	3	5282	112	2.80	13.8	8.9	2187
PRINCETON-AYRSHIRE 22	5	6923	113	2.99	12.2	9.1	2128
W.KENTUCKY 30	20	24183	118	2.98	9.9	8.5	2146
TOTALS	73	92254					

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
RAW COAL CHARACTERISTICS

SET P-2C REPORT 2.

	MINES	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
FULTON-PEORIA 03	1	856	99	2.90	16.2	11.4	1970
SPRINGFIELD 04	2	1264	99	3.83	15.0	13.8	2100
BELLEVILLE 07	5	2982	109	3.98	10.2	13.5	2197
SOUTHERN 09	14	4088	112	2.90	6.8	13.3	2176
LINTON-SULLIVAN 21	2	715	114	1.72	15.0	7.4	2339
PRINCETON-AYRSHIRE 22	3	2111	109	3.60	12.1	11.6	2089
W.KENTUCKY 30	25	21406	113	4.02	8.2	13.5	2107
TOTALS	52	33422					

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
DUST COAL CHARACTERISTICS

SET P-2C REPORT 3.

	MINES	TONS (000)	BTU (00)	SULPHUR (%)	MOIST (%)	ASH (%)	FUSION (TEMP)
SPRINGFIELD 04 RAW	1	91	98	3.50	16.4	12.8	2100
DANVILLE 05 WASHED	1	9	95	2.00	15.1	15.0	2100
SOUTHERN 09 WASHED	5	617	113	1.53	10.7	10.6	2121
SOUTHERN 09 RAW	2	775	109	2.07	10.6	11.3	2157
TOTALS	9	1512					

PRODUCER DATA EXHIBITS DX 52

Analysis: Overburden of Strip Mines and Depth of Deep Mines by Producing Districts

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-NORTHERN,MINERAL-ATKINSON, DANVILLE AND MURDOCK DISTRICTS.

SET P-1 REPORT E1

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
STRIP MINES									
AYRS	HARM	7	15-1 THRU 19-1	71	0	120	99	627	DANVILLE
PEAB	HSCO	6	15-1 THRU 19-1	44	0	51	44	1248	MINERAL-ATKINSON
PEAB	NRTH	2	25-1 THRU 29-1	36	0	85	73	759	NORTHERN
PEAB	NRTH	7	25-1 THRU 29-1	36	0	85	73	0	NORTHERN
SHTP	PION	6	15-1 THRU 19-1	40	0	45	39	117	MINERAL-ATKINSON
						TOTAL TONS		2747	
						WEIGHTED AVE. MAX. OVERBURDEN		76	
						WEIGHTED AVERAGE AVE. OVERBURDEN		64	
DEEP MINES									
BLEZ	MROK	7		84	210			747	MURDOCK
VDAY	VDAY	6		72	135			48	DANVILLE
						TOTAL TONS		795	
						DISTRICTS TOTAL TONS		3542	

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-FULTON PEORIA DISTRICT.

SET P-1 REPORT 22

STRIP MINES

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
AVRS	SUNS	2	30-1 OR MORE	28	0	80	57	621	FULTON-PEORIA
TXTR	PIAT	5	15-1 THRU 19-1	58	0	102	68	1523	FULTON-PEORIA
TXTR	LSIS	5	LESS THAN 15-1	55	0	92	60	917	FULTON-PEORIA
PEAB	EDND	6	LESS THAN 15-1	44	0	44	42	537	FULTON-PEORIA
PEAB	ALND	6		0	0			574	FULTON-PEORIA
PEAB	BSTR	5	15-1 THRU 19-1	53	0	57	47	546	FULTON-PEORIA
PEAB	BSTR	6	15-1 THRU 19-1	53	0	57	47	0	FULTON-PEORIA
PEAB	NDLG	5	20-1 THRU 24-1	46	0	71	60	1362	FULTON-PEORIA
PEAB	NDLG	6	20-1 THRU 24-1	46	0	71	60	0	FULTON-PEORIA
UEC	BK17	5	LESS THAN 15-1	57	0	85	61	1904	FULTON-PEORIA
UEC	CUSA	5	LESS THAN 15-1	52	0	56	47	974	FULTON-PEORIA
UEC	BK27	2	LESS THAN 15-1	28	0	80	28	834	FULTON-PEORIA

TOTAL TONS 10012

WEIGHTED AVE. MAX. OVERBURDEN 79
WEIGHTED AVERAGE AVE. OVERBURDEN 55

DISTRICT TOTAL TONS 10012

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-SPRINGFIELD DISTRICT.

SET P-1 REPORT E5

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
DEEP MINES									
TXTR	HILS	6		75	500			1169	SPRINGFIELD
PEAB	DYNO	6		84	404			5722	SPRINGFIELD
FREE	CRWN	6		84	354			2380	SPRINGFIELD
							TOTAL TONS	9271	
							DISTRICT TOTAL TONS	9271	

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-BELLEVILLE DISTRICT.

SET P-1 REPORT E4

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
STRIP MINES									
TXTR	BST2	6	LESS THAN 15-1	66	0	70	60	1500	BELLEVILLE
TXTR	BST3	5	LESS THAN 15-1	60	0	60	40	1683	BELLEVILLE
TXTR	BST3	6	LESS THAN 15-1	55	0	60	40	0	BELLEVILLE
PEAB	RKNG	6	LESS THAN 15-1	76	0	75	55	5316	BELLEVILLE
SWIL	CAPT	5	LESS THAN 15-1	99	0	90	62	5787	BELLEVILLE
SWIL	CAPT	6	LESS THAN 15-1	99	0	90	62	0	BELLEVILLE
SWIL	STRL	6	LESS THAN 15-1	71	0	71	60	1533	BELLEVILLE
UEC	FIDL	6	LESS THAN 15-1	75	0	80	59	2030	BELLEVILLE
						TOTAL TONS		17848	
					WEIGHTED AVE. MAX. OVERBURDEN			78	
					WEIGHTED AVERAGE AVE. OVERBURDEN			64	
DEEP MINES									
BLVV	BLVV	6		84	100			106	BELLEVILLE
BL&Z	SPRT	6		76	235			882	BELLEVILLE
VENO	VENO	6		93	260			33	BELLEVILLE
						TOTAL TONS		1021	
STRIP/DEEP MINES									
PEAB	RMST	6	LESS THAN 15-1	84	68	53	47	1413	BELLEVILLE
						TOTAL TONS		1413	
					WEIGHTED AVE. MAX. OVERBURDEN			53	
					WEIGHTED AVERAGE AVE. OVERBURDEN			47	
					DISTRICT TOTAL TONS			20282	

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-SOUTHERN DISTRICT.

SET P-1 REPORT 88

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVG OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
STRIP MINES									
AYRS	BLYA	6	LESS THAN 15-1	63	0	90	59	976	SOUTHERN
HSTN	HSTN	6	LESS THAN 15-1	58	0	30	25	15	SOUTHERN
JOLR	JOLR	20	LESS THAN 15-1	60	0	65	60	89	SOUTHERN
PEAB	WSCR	20	15-1 THRU 19-1	36	0	69	65	1344	SOUTHERN
PEAB	BNEY	6		0	0			984	SOUTHERN
SAHA	NO6	6	15-1 THRU 19-1	54	0	70	55	1120	SOUTHERN
						TOTAL TONS		4648	
			WEIGHTED AVG. MAX. OVERBURDEN					75	
			WEIGHTED AVERAGE AVE. OVERBURDEN					60	
DEEP MINES									
BAKY	BAKY	5		52	150			112	SOUTHERN
BLEZ	ZBL4	6		96	325			1271	SOUTHERN
BLOO	TINS	5		56	120			183	SOUTHERN
HRAG	HRAG	5		50	60			89	SOUTHERN
OLOO	NO21	6		99	656			2240	SOUTHERN
OLOO	NO24	6		99	666			2368	SOUTHERN
OLOO	NO9	6		99	482			1391	SOUTHERN
PRTN	PRTN	5		52	175			66	SOUTHERN
PEAB	UTIL	6		76	93			918	SOUTHERN
SAHA	5 16	5		66	175			1668	SOUTHERN

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
FREE	ORI3	6		99	800			2991	SOUTHERN
FREE	ORI4	6		79	275			1387	SOUTHERN
FREE	ORI5	6		99	612			1669	SOUTHERN
						TOTAL TONS		15969	
STRIP/DEEP MINES									
PEAB	EAGL	5	LESS THAN 15-1	41	149	57	45	309	SOUTHERN
PEAB	EAGL	6	LESS THAN 15-1	41	149	57	45	0	SOUTHERN
						TOTAL TONS		309	
					WEIGHTED AVE. MAX. OVERBURDEN			57	
					WEIGHTED AVERAGE AVE. OVERBURDEN			45	
						DISTRICT TOTAL TONS		20326	

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-INDIANA DISTRICTS.

SET P-1 REPORT 86

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
STRIP MINES									
AYRS	CHNK	3	15-1 THRU 19-1	67	0	120	84	1147	BRAZIL-CLINTON
AYRS	MINN	6	20-1 THRU 24-1	62	0	120	93	1624	LINTON-SULLIVAN
AYRS	MINN	7	20-1 THRU 24-1	38	0	65	52	0	LINTON-SULLIVAN
AYRS	WRIT	5	LESS THAN 15-1	49	0	80	47	1285	PRINCETON-AYRSHR
OLDB	BLKF	5	LESS THAN 15-1	48	0	90	40	1458	PRINCETON-AYRSHR
OLDB	BLKF	5A	LESS THAN 15-1	23	0	90	40	0	PRINCETON-AYRSHR
OLDB	ENOS	5	15-1 THRU 19-1	47	0	104	66	1673	PRINCETON-AYRSHR
PEAB	CHPT	7	20-1 THRU 24-1	32	0	63	61	476	BRAZIL-CLINTON
PEAB	MNTH	5	LESS THAN 15-1	24	0	42	35	2429	LINTON-SULLIVAN
PEAB	LYNV	6	LESS THAN 15-1	60	0	90	45	3385	PRINCETON-AYRSHR
PEAB	OLGL	30	15-1 THRU 19-1	30	0	63	48	601	LINTON-SULLIVAN
PEAB	VICT	5	15-1 THRU 19-1	42	0	58	95	896	PRINCETON-AYRSHR
						TOTAL TONS		14976	
						WEIGHTED AVE. MAX. OVERBURDEN		76	
						WEIGHTED AVERAGE AVE. OVERBURDEN		55	
DEEP MINES									
AYRS	THUN	5		44	307			1229	LINTON-SULLIVAN
OLDB	KING	5		75	450			335	PRINCETON-AYRSHR
RS&K	NO1	6		66	160			114	LINTON-SULLIVAN
						TOTAL TONS		1678	
						DISTRICTS TOTAL TONS		14654	

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
ALL MINES-W.KENTUCKY DISTRICT.

SET P-1 REPORT 87

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVG OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
STRIP MINES									
BAHN	BAHY	9	LESS THAN 15-1	50	0	65	40	360	W.KENTUCKY
BAHN	HO2	9	LESS THAN 15-1	50	0	65	40	304	W.KENTUCKY
BKTH	BKTH	9	LESS THAN 15-1	55	0	85	60	107	W.KENTUCKY
BAGE	BAGE	9	LESS THAN 15-1	48	0	75	43	122	W.KENTUCKY
BRKS	BKRN	9	LESS THAN 15-1	54	0	56	30	410	W.KENTUCKY
BARL	BARL	11	LESS THAN 15-1	47	0	100	11	2036	W.KENTUCKY
BARL	BARL	12	LESS THAN 15-1	48	0	100	90	0	W.KENTUCKY
BARL	BARL	13	15-1 THRU 19-1	36	0	100	39	0	W.KENTUCKY
BAGH	PIKR	9	15-1 THRU 19-1	44	0	125	70	1044	W.KENTUCKY
ISCK	PLSV	9	LESS THAN 15-1	60	0	80	55	567	W.KENTUCKY
KIRK	CANY	9	LESS THAN 15-1	60	0	110	75	670	W.KENTUCKY
KIRK	CANY	11	LESS THAN 15-1	72	0	110	75	0	W.KENTUCKY
KIRK	CANY	12	LESS THAN 15-1	66	0	110	75	0	W.KENTUCKY
WRIT	WRIT	9	LESS THAN 15-1	60	0	85	60	521	W.KENTUCKY
WRIT	WRIT	11	LESS THAN 15-1	72	0	85	60	0	W.KENTUCKY
WRIT	WRIT	12	LESS THAN 15-1	66	0	85	60	0	W.KENTUCKY
MORS	MRTN	6	LESS THAN 15-1	30	0	60	30	56	W.KENTUCKY
PEAB	MRST	9	LESS THAN 15-1	52	0	139	110	2353	W.KENTUCKY
PEAB	MRST	11	LESS THAN 15-1	52	0	139	110	0	W.KENTUCKY
PEAB	MRST	13	LESS THAN 15-1	52	0	139	110	0	W.KENTUCKY
PEAB	RIVW	11	LESS THAN 15-1	5	0	60	50	1053	W.KENTUCKY
PEAB	RIVW	14	LESS THAN 15-1	5	0	60	55	0	W.KENTUCKY
PEAB	SNCL	9	LESS THAN 15-1	64	0	70	65	4826	W.KENTUCKY
PEAB	SNCL	11	LESS THAN 15-1	64	0	70	65	0	W.KENTUCKY
PEAB	SNCL	12	LESS THAN 15-1	64	0	70	65	0	W.KENTUCKY
PEAB	YOKE	11	LESS THAN 15-1	64	0	56	50	2711	W.KENTUCKY

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVG OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
PEAB	VOGE	12	LESS THAN 15-1	66	0	54	50	0	W.KENTUCKY
PTRV	COLO	9	LESS THAN 15-1	60	0	145	71	2822	W.KENTUCKY
PTRV	COLO	11	LESS THAN 15-1	72	0	145	71	0	W.KENTUCKY
PTRV	COLO	12	LESS THAN 15-1	54	0	145	71	0	W.KENTUCKY
PTRV	COLO	14	LESS THAN 15-1	96	0	145	71	0	W.KENTUCKY
PTRV	PARA	9	LESS THAN 15-1	56	0	120	60	2092	W.KENTUCKY
PTRV	PARA	11	LESS THAN 15-1	72	0	120	60	0	W.KENTUCKY
PTRV	PARA	12	LESS THAN 15-1	72	0	120	60	0	W.KENTUCKY
PTRV	PARA	13	LESS THAN 15-1	36	0	120	60	0	W.KENTUCKY
RUSS	LTLJ	9	LESS THAN 15-1	50	0	55	35	369	W.KENTUCKY
TASS	LKVW	11	LESS THAN 15-1	60	0	50	30	567	W.KENTUCKY
TASS	LKVW	09	LESS THAN 15-1	52	0	50	30	0	W.KENTUCKY
WICR	SNRK	11	LESS THAN 15-1	72	0	85	60	437	W.KENTUCKY
WICR	SNRK	14	LESS THAN 15-1	54	0	85	60	0	W.KENTUCKY
WESK	WESK	9	LESS THAN 15-1	60	0	60	40	151	W.KENTUCKY
						TOTAL TONS		23210	
			WEIGHTED AVE. MAX. OVERBURDEN					93	
			WEIGHTED AVERAGE AVE. OVERBURDEN					60	

DEEP MINES

BLGZ	ZGL9	9	72	340		535	W.KENTUCKY
BLGZ	ORIL	11	72	240		634	W.KENTUCKY
OCLA	OCLA	9	60	325		102	W.KENTUCKY
ISCK	EDIA	9	62	275		2375	W.KENTUCKY
ISCK	PIES	11	64	250		1442	W.KENTUCKY
ISCK	CRES	11	62	200		1051	W.KENTUCKY
ISCK	UNTH	9	62	350		1473	W.KENTUCKY
ISCK	ATKN	9	60	200		1478	W.KENTUCKY
ISCK	WILS	6	48	150		231	W.KENTUCKY
PTRV	DEK6	6	50	500		1947	W.KENTUCKY

COAL CO.	MINE	SEAM NO.	RATIO	SEAM THICK (INCHES)	DEPTH DEEP (FEET)	MAX OB (FEET)	AVE OB (FEET)	TOTAL TONS (000)	PRODUCING DISTRICT
PTHV	DEKY	9		60	800			1398	W.KENTUCKY
PYRO	PYRO	9		55	100			1104	W.KENTUCKY
WEST	DOTI	9		54	300			406	W.KENTUCKY
						TOTAL TONS		13758	

STRIP/DEEP MINES

PEAB	KEN	9	LESS THAN 15-1	54	90	93	69	2826	W.KENTUCKY
PEAB	KEN	11	LESS THAN 15-1	54	90	93	69	0	W.KENTUCKY
PEAB	RVGN	9	LESS THAN 15-1	60	142	64	52	5341	W.KENTUCKY
PEAB	RVGN	11	LESS THAN 15-1	60	142	64	52	0	W.KENTUCKY
PEAB	RVGN	12	LESS THAN 15-1	60	142	64	52	0	W.KENTUCKY
REAL	JEFF	6	LESS THAN 15-1	42	100	95	60	454	W.KENTUCKY
						TOTAL TONS		8621	

WEIGHTED AVE. MAX. OVERBURDEN 75
WEIGHTED AVERAGE AVE. OVERBURDEN 58

DISTRICT TOTAL TONS 45569

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
STRIP MINING CHARACTERISTICS

SET P-1 REPORT G1

OVERBURDEN RATIO CATEGORY

	LESS THAN 15-1	15-1 THRU 19-1	20-1 THRU 24-1	25-1 THRU 29-1	30-1 OR MORE
STRIP MINES					
NO. OF MINES	37	13	3	1	1
TOTAL TONNAGE	52759	13946	3482	755	821
WEIGHTED AVERAGE AVE. OVERBURDEN	59	62	76	73	57
STRIP/DEEP MINES					
NO. OF MINES	5	0	0	0	0
TOTAL TONNAGE	10343	0	0	0	0
WEIGHTED AVERAGE AVE. OVERBURDEN	56	0	0	0	0

CONSUMER DATA EXHIBITS DX 53

Boiler Specifications

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
BOILER SPECIFICATIONS
ALL FACILITIES SET C-2 REPORT 1.

	TOTAL	COAL CHARACTERISTICS SPECIFIED: SIZE	SULPHUR MAX	ASH	MOISTURE	FUSION	OTHER	BTU	WASHED	NO SPECS	CAN CONVERT
NUMBER OF FACILITIES	289	250	177	197	203	174	82	192	177	23	36
PERCENT	100.0	86.5	61.2	68.2	70.2	60.2	28.4	66.4	61.2	8.0	12.5
TOTAL TONS	90283	71726	60754	64930	68016	70069	56499	69448	19539	8946	2968
PERCENT	100.0	79.4	67.3	74.1	75.3	77.6	62.5	76.9	21.7	9.9	3.3

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
BOILER SPECIFICATIONS

SET C-2 REPORT 2.

UTILITIES

	TOTAL	COAL CHARACTERISTICS SPECIFIED: SIZE	SULPHUR MAX	ASH	MOISTURE	FUSION	OTHER	BTU	WASHED	NO SPECS	CAN CONVERT
NUMBER OF FACILITIES	112	88	60	71	82	80	52	69	36	12	4
PERCENT	100.0	78.6	53.6	63.4	73.2	71.4	46.4	61.6	32.1	10.7	3.6
TOTAL TONS	76531	60047	52214	57566	59102	63324	53340	61290	9560	7042	533
PERCENT	100.0	78.5	68.2	75.2	77.2	82.7	69.7	80.1	12.5	9.2	0.7

NON-UTILITIES STEAM COAL

NUMBER OF FACILITIES	172	158	113	122	117	91	29	120	137	10	31
PERCENT	100.0	91.9	65.7	70.9	68.0	52.9	16.9	69.8	79.7	5.8	18.0
TOTAL TONS	12218	10538	7401	8225	7775	5930	2369	7341	8890	1509	2433
PERCENT	100.0	86.2	60.6	67.3	63.6	48.5	19.4	60.1	72.8	12.4	19.9

The above category entitled "Non-Utilities Steam Coal" consists of all manufacturing firms and institutions OTHER than those purchasing metallurgical coal solely for the purpose of coking.

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
BOILER SPECIFICATIONS

SET C-2 REPORT 2A

TYPE 1.

	TOTAL	SIZE	SULPHUR MAX	ASH	MOISTURE	FUSION	OTHER	BTU	WASHED	NO SPECS	CAN CONVEAT
NUMBER OF FACILITIES	84	64	44	52	64	66	42	56	16	11	2
PERCENT	100.0	76.2	52.4	61.9	76.2	78.6	50.0	66.7	19.0	13.1	2.4
TOTAL TONS	74202	57849	50826	55777	57369	61624	52273	60589	8459	6989	454
PERCENT	100.0	78.0	68.5	75.2	77.3	83.0	70.4	81.7	11.4	9.4	0.6

TYPE 2.

NUMBER OF FACILITIES	28	24	16	19	18	14	10	13	20	1	2
PERCENT	100.0	85.7	57.1	67.9	64.3	50.0	35.7	46.4	71.4	3.6	7.1
TOTAL TONS	7329	2178	1368	1789	1713	1700	1067	701	1101	53	79
PERCENT	100.0	93.5	59.6	76.8	73.6	73.0	45.8	30.1	47.3	2.3	3.4

"Type 1" is the code number given "LARGE UTILITIES"; "Type 2" is the code for "SMALL UTILITIES." The distinction between the two categories is based upon a comparison of the type of power system and the total tons of coal purchased by that system in 1967. Thus, the classification "SMALL UTILITIES (Type 2)" represents all cooperative and municipal power systems whose facilities in the aggregate purchased less than 500,000 tons of coal in 1967. The classification "LARGE UTILITIES (Type 1)" consists of all corporate power systems, public or private, and all cooperative or municipal systems whose 1967 total coal consumption at all facilities combined was 500,000 or more.

DEFENDANT'S EXHIBIT 54

Consumer Data Exhibits, Types of Sales by Producing Districts

KIRKLAND ELLIS
U.S VS GENERAL DYNAMICS
TYPE OF SALES BY PRODUCING DISTRICT

SET C-1 REPORT 1

DISTRICT	TONS(000)			
	UTILITIES	COKING	OTHER	TOTAL
NORTHERN 01	0	0	573	573
MINERAL-ATKINSON 02	1015	0	98	1113
FULTON-PEORIA 03	6105	0	2421	8526
SPRINGFIELD 04	9371	0	370	9741
DANVILLE 05	186	0	91	277
MURDOCK 06	116	0	532	648
BELLEVILLE 07	16376	0	1943	18319
SOUTHERN 09	10808	1437	2955	15200
BRAZIL-CLINTON 20	324	36	386	746
LINTON-SULLIVAN 21	2726	61	544	3331
PRINCETON-AYRSHIRE 22	6603	0	704	7307
W.KENTUCKY 30	22901	0	1601	24502
ALL DISTRICTS TOTAL	76531	1534	12218	90283

DEFENDANT'S EXHIBIT 55

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN FULTON-PEORIA FREIGHT RATE DISTRICT

1. Utility Facilities Located in Fulton-Peoria Sales Area

Company	Facility	City	County	State
Illinois	Havanna	Havanna	Mason	Illinois
	Hennepin	Hennepin	Putnam	Illinois
CILCO	Edwards	Bartonville	Peoria	Illinois
	Liberty	Peoria	Peoria	Illinois
	Wallace	E. Peoria	Tazewell	Illinois
CIPS	Meredosia	Meredosia	Morgan	Illinois

2. Coal Consumption by Utility Facilities Located in Fulton-Peoria Sales Area

	Tons Consumed (000)		% of Total Consumption	
Fulton-Peoria Production Consumed by Utilities in Sales Area		2250		87%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11 [1]				
Belleville	316		12	
Mineral Atkinson	31	347	1	13%
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA		2597		100%

3. Fulton-Peoria Production Sold to Utilities

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	2250	37%
Sold to Commonwealth Edison	3855	63%
Sold to Other Utilities	0	0%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN FULTON-PEORIA FRT. DIST.	6105	100%

Source: Form 150, Subpoena Questionnaire

[1] Excludes shipment of 92,000 tons of dust from Crown Mine in Springfield District to Meredosia facility of CIPS.

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE FULTON-PEORIA FREIGHT RATE DISTRICT

1. Non-Utility Facilities in Fulton-Peoria Sales Area

Company	City	County	State
E. I. Dupont	Clinton	Clinton	Iowa
Grain Processing	Muscatine	Muscatine	Iowa
Standard Brands	Clinton	Clinton	Iowa
Dewey P. Cement	Buffalo	Muscatine	Iowa
Rock Island Arsenal	Rock Island	Rock Island	Illinois
Deere and Company	E. Moline	Rock Island	Illinois
Alpha P. Cement	LaSalle	LaSalle	Illinois
Marquette Cement	Oglesby	LaSalle	Illinois
Nabisco	Marseilles	LaSalle	Illinois
Ottawa Silica Co.	Ottawa	LaSalle	Illinois
Libbey-Owens Ford	Ottawa	LaSalle	Illinois
American Distilling	Pekin	Tazewell	Illinois
Corn Products	Pekin	Tazewell	Illinois
Standard Brands	Pekin	Tazewell	Illinois
Caterpillar Tractor	Peoria	Peoria	Illinois
Caterpillar Tractor	E. Peoria	Tazewell	Illinois
Celotex Corporation	Peoria	Peoria	Illinois
H. Walker & Sons	Peoria	Peoria	Illinois
Keystone Steel & Wire	Bartonville	Peoria	Illinois
Medusa Portland Cement	Dixon	Lee	Illinois

2. Coal Consumption by Non-Utility Facilities Located in Fulton-Peoria Sales Area

	Tons Consumed (000)		% of Total Consumption	
Fulton-Peoria Production Consumed by Non-Utilities in Sales Area		1701		85%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Southern Illinois	212[1]		11	
Mineral Atkinson	44		2	
W. Kentucky	36	292	2	15%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA		1993		100%

[1] Includes 73,000 tons (4%) of low-sulphur coal (1.2%) from Freeman's Orient #3 Mine in the Southern Freight District to the Dixon plant of Medusa Portland Cement for Equipment requiring coal having a maximum sulphur content of 1.2%. See Medusa Portland Cement Form 150, Subpoena Questionnaire and letter of August 15, 1968 from Thompson, Hine and Flory to Plaintiff.

3. Fulton-Peoria Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	1701	70%
Sold to Greater Chicago Air Quality Control Region	586	24
Sold to Other Non-Utilities	134	6%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN FULTON-PEORIA FRT. DIST.	2421	100%

Source: Form 150, Subpoena Questionnaire

RECAPITULATION OF SALES OF COAL PRODUCED IN THE FULTON-PEORIA FREIGHT RATE DISTRICT

1. Coal Consumption by All Facilities in Fulton-Peoria Sales Area

	Tons Consumed (000)		% of Total Consumption	
Fulton-Peoria Production Consumed by All Facilities in Sales Area	3951		86%	
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11[1]				
Belleville	316		7%	
Southern Illinois	212		5%	
Mineral-Atkinson	75		2%	
W. Kentucky	36	639	1%	14%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		4590		100%

2. Fulton-Peoria Production Sold to All Facilities

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	3951	46%
Sold to Commonwealth Edison	3855	45%
Sold to Chicago Air Quality Control Region	586	7%
Sold to Other Facilities	134	2%
TOTAL	8526	100%

[1] Excludes shipment of 92,000 tons of dust from Crown Mine in Springfield District to Meredosia facility of CIPS.

Includes 73,000 tons (4%) of low-sulphur coal (1.2%) from Freeman's Orient #3 Mine in the Southern Freight District to the Dixon plant of Medusa Portland Cement for equipment requiring coal having a maximum sulphur content of 1.2%. See Medusa Portland Cement Form 150, Subpoena Questionnaire and letter of August 15, 1968 from Thompson, Hine and Flory to Plaintiff.

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN SPRINGFIELD FREIGHT RATE DISTRICT

1. Utility Facilities Located In Springfield Sales Area

Company	Facility	County	State
CIPS	Coffeen	Montgomery	Illinois
SPRINGFIELD WL&P	Springfield	Sangamon	Illinois

2. Coal Consumption by Utility Facilities Located in Springfield Sales Area

	Tons Consumed (000)	% of Total Consumption
Springfield Production Consumed by Utilities in Sales Area	1489	100%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11	0	0%
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA	1489	100%

3. Springfield Production Sold to Utilities[1]

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	1489	16%
Sold to Commonwealth Edison	7584	82%
Sold to Other Utilities	206	2%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN SPRINGFIELD FRT. DIST.	9279	100%

[1] Excludes 92,000 tons of dust shipped from the Crown Mine of Freeman to the Meredosia facility of CIPS. See CIPS Form 150 (Meredosia). Subpoena Questionnaire.

Source: Form 150, Subpoena Questionnaire

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE SPRINGFIELD FREIGHT RATE DISTRICT

1. Non-Utility Facilities in the Springfield Sales Area

Company	City	County	State
A. E. Staley	Decatur	Macon	Illinois
Caterpillar Tractor	Decatur	Macon	Illinois

2. Coal Consumption by Non-Utility Facilities Located in Springfield Sales Area

	Tons Consumed (000)	% of Total Consumption
Springfield Production Consumed by Non-Utilities in Sales Area	344	83%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11 Mineral Atkinson	70	17%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA	414	100%

3. Springfield Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	344	93%
Sold to Greater Chicago Air Quality Control Region	—	—
Sold to Other Non-Utilities	26	7%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN SPRINGFIELD FRT. DIST.	370	100%

Source: Form 150, Subpoena Questionnaire

RECAPITULATION OF SALES OF COAL PRODUCED IN THE SPRINGFIELD FREIGHT RATE DISTRICT

1. Coal Consumed by All Facilities in Springfield Sales Area

	Tons Consumed (000)	% of Total Consumption
Springfield Production Consumed by All Facilities in Sales Area	1833	96%
Consumption of Coal Produced by Other Freight Rate Districts in Mining Districts 9, 10 & 11 Mineral-Atkinson	70	4%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA	1903	100%

2. Springfield Production Sold to All Facilities [1]

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	1833	19%
Sold to Commonwealth Edison	7584	79%
Sold to Chicago Air Quality Control Region	—	—
Sold to Other Facilities	232	2%
TOTAL	9649	100%

[1] Excludes 92,000 tons of dust shipped from the Crown Mine of Freeman to the Meredosia facility of CIPS. See CIPS Form 150 (Meredosia). Subpoena Questionnaire.

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN BELLEVILLE FREIGHT RATE DISTRICT

1. Utility Facilities Located in Belleville Sales Area

Company	Facility	City	County	State
Interstate Power	Dubuque	Dubuque	Dubuque	Iowa
Interstate Power	Lansing	Lansing	Alamakee	Iowa
Dairyland Power	Stoneman	Cassville	Clayton	Wisconsin
Dairyland Power	Alma	Alma	Wabasha	Wisconsin
Wisconsin P & L	Nelson Dewey	Cassville	Clayton	Wisconsin
Northern Sta. Power	King	Stillwater	Washington	Minnesota
Northern Sta. Power	High Bridge	St. Paul	Ramsey	Minnesota
Northern Sta. Power	Black Dog	Minneapolis	Ramsey	Minnesota
Northern Sta. Power	Riverside	Minneapolis	Ramsey	Minnesota
Interstate Power	Kapp	Clinton	Muscatine	Iowa
Municipal Power	Muscatine	Muscatine	Muscatine	Iowa
E. Iowa Light & Power	Montpelier	Montpelier	Muscatine	Iowa
Iowa-Ill. Gas & Elec.	Riverside	Bettendorf	Scott	Iowa
Ill. Power	Wood River	Wood River	Madison	Illinois
Union Electric	Venice	Venice	Madison	Illinois
City of Highland	Highland	Highland	Madison	Illinois
Union Electric	Cahokia	Chaokia	Sinclair	Illinois
Union Electric	Ashley	St. Louis	St. Louis	Missouri
Union Electric	Meramac	St. Louis	St. Louis	Missouri
Central Elec. Power Coop.	Chamois	Chamois	Callaway	Missouri

2. Coal Consumption by Utility Facilities Located In Belleville Sales Area

	Tons Consumed (000)		% of Total Consumption
Belleville Production Consumed by Utilities in Sales Area	7446		80%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11			
Southern [1]	918	10%	
West Kentucky	436	5%	
Mineral-Atkinson	429	5%	
Springfield [2]	62	1%	
	1845		21%
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA	9291		100%*

* The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

3. Belleville Production Sold to Utilities

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	7446	45%
Sold to Commonwealth Edison	6526	40%
Sold to Greater Chicago Air Quality Control Region	1307	8%
Sold to Other Utilities	1097	7%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN BELLEVILLE FRT. DIST.	16376	100%

[1] Excludes 970,000 tons of dust from mines in the Southern Freight Rate District to the Cahokia, Venice and Meramac facilities of Union Electric, the Alma facility of Dairyland Power and the Wood River facility of Illinois Power. See the corresponding Forms 150, Subpoena Questionnaire.

[2] This is a shipment from the Little Dog Mine in the Springfield Freight Rate District to the Wood River facility of Illinois Power made possible because both mine and plant are local to the Illinois Terminal Railroad. See Beck Dep. Tr., pp. 11-12, 34. No other Springfield District mine is so located.

Source: Form 150, Subpoena Questionnaire

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE BELLEVILLE FREIGHT RATE DISTRICT

1. Non-Utility Facilities in Belleville Sales Area

Company	City	County	State
American Oil	Wood River	Madison	Illinois
Alton Box Board	Alton	Madison	Illinois
Shell Oil	Roxanna	Madison	Illinois
Swift & Co.	E. St. Louis	St. Clair	Illinois
Union Starch	Granite City	Madison	Illinois
Chas. Pfizer & Co.	E. St. Louis	St. Clair	Illinois
Monsanto	Sauget	St. Clair	Illinois
Alpha Portland	St. Louis	St. Louis	Missouri
Anheuser Busch	St. Louis	St. Louis	Missouri
Drew Foods	St. Louis	St. Louis	Missouri
Mallinckrodt Chemical	St. Louis	St. Louis	Missouri
Monsanto	St. Louis	St. Louis	Missouri
National Lead	St. Louis	St. Louis	Missouri
Swift & Co.	St. Louis	St. Louis	Missouri

2. Coal Consumption by Non-Utility Facilities Located in Belleville Sales Area

	Tons Consumed (000)	% of Total Consumption
Belleville Production Consumed by Non-Utilities in Sales Area	1254	98%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11 Springfield [1]	25	2%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA	1280	100%

[1] This is a shipment from the Little Dog Mine in the Springfield Freight Rate District to the Wood River plant of American Oil made possible because both mine and plant are local to the Illinois Terminal Railroad. See Beck Dep. Tr., pp. 11-12, 34. No other Springfield District mine is so located.

3. Belleville Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	1254	65%
Sold to Greater Chicago Air Quality Control Region	469	24%
Sold to Other Non-Utilities	220	11%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN BELLEVILLE FRT. DIST.	1943	100%

Source: Form 150, Subpoena Questionnaire

RECAPITULATION OF SALES OF COAL PRODUCED IN THE BELLEVILLE FREIGHT RATE DISTRICT

1. Coal Consumption by All Facilities in Belleville Sales Area

	Tons Consumed (000)		% of Total Consumption	
Belleville Production Consumed by All Facilities in Sales Area		8700		82%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Southern Illinois[1]	918		9%	
W. Kentucky	436		4%	
Mineral-Atkinson	429		4%	
Springfield[2]	88	1871	1%	18%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		10571		100%

2. Belleville Production Sold to All Facilities

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	8700	47%
Sold to Commonwealth Edison	6526	36%
Sold to Chicago Air Quality Control Region	1776	10%
Sold to Other Facilities	1317	7%
TOTAL	18319	100%

[1] Excludes 970,000 tons of dust from mines in the Southern Freight Rate District to the Cahokia, Venice and Meramac facilities of Union Electric, the Alma facility of Dairyland Power and the Wood River facility of Illinois Power. See the corresponding Forms 150, Subpoena Questionnaire.

[2] This tonnage represents shipments of 62,000 tons and 26,000 tons from the Little Dog Mine in the Springfield Freight Rate District to the Wood River Station of Illinois Power and the Wood River plant of American Oil respectively. These transactions were made possible because that mine and both facilities are local to the Illinois Terminal Railroad. See Beck Dep. Tr., pp. 11-12, 34. No other Springfield District mine is so located.

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN SOUTHERN (ILLINOIS) FREIGHT RATE DISTRICT

1. Utility Facilities Located in Southern Sales Area

Company	Facility	City	County	State
TVA	Shawnee	Paducah	McCracken	Kentucky
Wisc. P & L	Edgewater	Sheboygan	Sheboygan	Wisconsin
Wisc. E. P.	Port Washington	Port Washington	Ozaukee	Wisconsin
Wisc. E. P.	Oak Creek	Oak Creek	Milwaukee	Wisconsin
Wisc. E. P.	Lakeside	St. Francis	Milwaukee	Wisconsin
Wisc. Pub. Serv.	Weston	Green Bay	Brown	Wisconsin
Wisc. Pub. Serv.	Pulliam	Rothschild	Marathon	Wisconsin
Marshfield E&W	Wildwood	Marshfield	Wood	Wisconsin
Menasha E&W	Menasha	Menasha	Winnebago	Wisconsin
Electric Energy	Joppa	Joppa	Massac	Illinois
CIPS	Grand Tower	Grand Tower	Jackson	Illinois
So. Ill. Pow Coop.	Marion	Marion	Williamson	Illinois
Union Electric	Sioux	W. Alton	St. Charles	Missouri
N.E. Mo. E. Pwr. Coop.	South River	Palmyra	Marion	Missouri
Ia. E.L.&P.	Sutherland	Marshalltown	Marshall	Iowa
Ia. Pub. Serv.	Maynard	Waterloo	Black	Iowa
Ia. Pub. Serv.	Sixth St. Station	Cedar Rapids	Linn	Iowa

2. Coal Consumption by Utility Facilities Located in Southern Sales Area

	Tons Consumed (000)		% of Total Consumption	
Southern Production Consumed by Utilities in Sales Area		7987		53%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
West Kentucky	5704		38%	
Belleville [1]	556		4%	
Mineral-Atkinson	530		3%	
Indiana	255		1%	
Murdock	92		1%	
Springfield	34	7171	—	47%
TOTAL		15158		

3. Southern Production Sold to Utilities

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	7987	81%
Sold to Commonwealth Edison	137	1%
Sold to Other Utilities [2]	1714	17%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN SOUTHERN FRT. DIST.	9838	100%

[1] Includes 265,000 tons (2%) from the Fidelity Mine of United Electric to the Shawnee plant of TVA in Paducah, Kentucky, shipped under a Freeman contract. In response to Form 150 of the Subpoena Questionnaire TVA received no other Belleville Freight District coal. In response to the Government Questionnaire, no other Belleville producer reported sales to TVA. See also, Nugent Dep., Tr. p. 235.

[2] Excludes 970,000 tons of dust from various Southern mines to Belleville sales area utilities. See Footnote 1, Table D-1B.

Source: Form 150, Subpoena Questionnaire.

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE SOUTHERN (ILLINOIS) FREIGHT RATE DISTRICT [1]

1. Non-Utility Facilities in the Southern Sales Area

Company	City	County	State
Northwest. States Port. Cmt.	Mason City	Cerro Gordo	Iowa
Amer. Crystal Sugar	Mason City	Cerro Gordo	Iowa
Lehigh Port. Cmt.	Mason City	Cerro Gordo	Iowa
Univ. of Iowa	Iowa City	Johnson	Iowa
Deere and Company	Waterloo	Black	Iowa
Penick & Ford, Ltd.	Cedar Rapids	Linn	Iowa
American Motors	Kenosha	Kenosha	Wisconsin
U.S. Glue	Oak Creek	Milwaukee	Wisconsin
Marquette Cement	Milwaukee	Milwaukee	Wisconsin
Allis-Chalmers	W. Allis	Milwaukee	Wisconsin
Thilmany Pulp & Paper	Kaukauna	Outagamie	Wisconsin
Scott Paper	Marinette	Marinette	Wisconsin
Medusa Port. Cmt.	Manitowoc	Manitowoc	Wisconsin
American Can	Green Bay	Brown	Wisconsin
American Can	Rothschild	Marathon	Wisconsin
Consol. Papers	Wisconsin Rapids	Wood	Wisconsin
Mosinee Paper Mills	Mosinee	Marathon	Wisconsin
Nekoosa Edwards Paper	Pt. Edwards	Wood	Wisconsin
Owens-Illinois	Tomahawk	Lincoln	Wisconsin
St. Regis Paper	Rhinelander	Oneida	Wisconsin
Hercules, Inc.	Louisiana	Pike	Missouri
Dundee Cement	Clarksville	Pike	Missouri
U.S. Steel	Hannibal	Marion	Missouri
Miss. Lime	Ste. Genevieve	Ste. Genevieve	Missouri
Marquette Cement	Cape Girardeau	Cape Girardeau	Missouri

[1] Excluding sales of 1,437,000 tons of metallurgical coal.

2. Coal Consumption by Non-Utility Facilities Located in Southern Sales Area

	Tons Consumed (000)		% of Total Consumption	
Southern Production Consumed by Non-Utilities in Sales Area	1627		76%	
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Indiana	261		12%	
West Kentucky	150		7%	
Mineral-Atkinson	54		3%	
Fulton-Peoria	28		1%	
Belleville	21	514	1%	24%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA	2141		100%	

3. Southern Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	1627	55%
Sold to Greater Chicago Air Quality Control Region	966	33%
Sold to Other Non-Utilities	362	12%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN SOUTHERN FRT. DIST.	2955	100%

Source: Form 150, Subpoena Questionnaire.

RECAPITULATION OF SALES OF COAL PRODUCED IN THE SOUTHERN FREIGHT RATE DISTRICT

1. Coal Consumption by All Facilities in Southern Sales Area

	Tons Consumed (000)		% of Total Consumption	
Southern Production Consumed by All Facilities in Sales Area [1]		9614		56%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
West Kentucky	5854		34%	
Mineral-Atkinson	584		3	
Belleville [2]	577		3	
Indiana	516		3	
Murdock	92		1	
Springfield	34		—	
Fulton-Peoria	28	7685	—	44%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		17299		100%

2. Southern Production Sold to All Facilities

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	9614	75%
Sold to Commonwealth Edison	137	1
Sold to Chicago Air Quality Control Region	966	8
Sold to Other Facilities [1] [3]	2076	16
TOTAL	12793	100%

[1] Excluding sales of 1,437,000 tons of metallurgical coal.

[2] Includes 265,000 tons (2%) from the Fidelity Mine of United Electric to the Shawnee plant of TVA in Paducah, Kentucky, shipped under a Freeman contract. In response to Form 150 of the Subpoena Questionnaire TVA received no other Belleville Freight District coal. In response to the Government Questionnaire, no other Belleville producer reported sales to TVA. See also, Nugent Dep., Tr. p. 235.

[3] Excludes 970,000 tons of dust from various Southern mines to Belleville sales area utilities. See Footnote 1, Table D-1B.

SALE OF COAL TO FACILITIES LOCATED IN THE METROPOLITAN CHICAGO AIR QUALITY CONTROL REGION [1]

1. Facilities Located in Chicago Air Quality Control Region

Company		County
Abbott Laboratories	N. Chicago	Lake (Ill.)
American Maize	Hammond	Lake (Ind.)
Argonne	Near Lemont	Du Page
Armour	Montgomery	Kane
Armour	McCook	Cook
Automatic Electric	Northlake	Cook
Campbell Soup	Chicago	Cook
Caterpillar	Aurora	Kane
Caterpillar	Joliet	Will
Celotex	Chicago	Cook
Central Soya	Chicago	Cook
Container Corp.	Chicago	Cook
Container Corp.	Chicago	Cook
Corn Prod.	Argo	Cook
Darling	Chicago	Cook
Darling	Chicago	Cook
Army Ammunitions	Joliet	Will
Wyman Gordon	Harvey	Cook
Inland Steel	E. Chicago	Lake (Ind.)
Interlake	Riverdale	Cook
Interlake	Chicago	Cook
Int'l. Harvester	Melrose Park	Cook
Int'l. Harvester	Chicago	Cook
Int'l. Harvester	Chicago	Cook
Metro. San. Dist.	Cicero	Cook
Northwestern U.	Evanston	Cook
Nipsco	Gary	Lake (Ind.)
Olin Mathieson	Joliet	Will
Procter & Gamble	Chicago	Cook
GAF Corp. (Rubberoid)	Joliet	Will
Sherwin-Williams	Chicago	Cook
Standard Lime	LaGrange	Cook
Swift	Chicago	Cook
Union Carbide	E. Chicago	Lake (Ind.)
Union Carbide	Whiting	Lake (Ind.)
U. S. Navy	N. Chicago	Lake (Ill.)
U. S. Steel	Gary	Lake (Ind.)
U. S. Steel	Gary	Lake (Ind.)
Western Electric	Chicago	Cook
Youngstown	E. Chicago	Lake (Ind.)

[1] The Metropolitan Chicago Interstate Air Quality Control Region, as designated 42 C.F.R. § 81.14 (33 F. R. 17176, Nov. 20, 1968), consists of Lake, McHenry, Cook, Du Page, Kane and Will Counties in Illinois and Lake and Porter Counties in Indiana. Tonnage to Commonwealth Edison facilities has not been included.

2. Coal Consumption by Facilities Located in Chicago Air Quality Control Region

	Tons Consumed (000)	% of Total Consumption
FROM FREIGHT RATE DISTRICT:		
Southern	966	20%
Fulton-Peoria	586	12
Belleville	1776	36
Springfield	—	—
	3328	67
Northern Illinois	465	10
Indiana	1089	22
West Kentucky	56	1
TOTAL CONSUMPTION	4938	100%

Source: Form 150, Subpoena Questionnaire.

APPENDIX

EXHIBITS (Pages 481-920)

OCT 10 19

MICHAEL RODAK, JR.

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

	Page
Government Exhibits:	
GX 1— Annual Report of General Dynamics Corporation 1960	1
GX 2— Annual Report of General Dynamics Corporation 1961	3
GX 3— Annual Report of General Dynamics Corporation 1962	5
GX 4— Annual Report of General Dynamics Corporation 1963	6
GX 5— Annual Report of General Dynamics Corporation 1964	7
GX 6— Annual Report of General Dynamics Corporation 1965	8
GX 7— Annual Report of General Dynamics Corporation 1966	9
GX 24— Chart entitled "The United Electric Coal Companies Fixed Assets, Long Term Indebtedness, Working Capital and Net Assets or Stockholders Equity 1940 to 1967"	10

Government Exhibits:—Continued		Page
GX 25—	Chart entitled "The United Electric Coal Companies Net Sales, Earnings Before Income Taxes, Net Earnings, and Net Earnings as a Percentage of Net Sales 1940 to 1968"	12
GX 26—	Standard & Poor's Industry Surveys—"Coal," April 28, 1966, Section 2, Basic Analysis	13
GX 27—	Letter dated March 26, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Declared and Paid by UEC during the period January 1, 1950 to December 31, 1967	29
GX 29—	Standard Industrial Classification Manual 1967	33
GX 31—	Chart entitled "The Consumption of Fuel by Steam-Electric Plants in the Eastern Interior Province Sales Area for the Years 1960-1967"	37
GX 32—	Chart entitled "Consumption of Fuel (Shown in Millions of BTU's) by Portland Cement Plants in Illinois in 1967" and Chart entitled "Consumption of Fuel by Portland Cement Plants in Eastern Interior Coal Province Sales Area in 1967"	38
GX 34—	Financial Statements: The United Electrical Coal Companies; Year Ended December 31, 1968	40
GX 35—	City, Water, Light & Power (Springfield) letter to Department of Justice dated March 21, 1968	42
GX 36—	Illinois Power Company letter to Department of Justice dated March 21, 1968	46
GX 37—	Dairyland Power Cooperative letter to Department of Justice dated April 23, 1968	53
GX 39—	Corn Products Company letter to Department of Justice dated May 24, 1968	57
GX 41—	Union Carbide Corporation letter to Department of Justice dated August 2, 1968	60
GX 43—	Dundee Smith Company letter to Department of Justice dated August 22, 1968	62
GX 49—	A Staff Report on National Gas Supply and Demand by the Federal Power Commission	65
GX 51—	Chart entitled "Coal Shipments to Illinois Destinations by District of Origin, 1965 to 1967"	67
GX 52—	Chart entitled "1967 Sales of Coal in the Eastern Interior Coal Province Sales Area by Coal Producers Located in Illinois, Indiana and Western Kentucky"	68
GX 54—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Crown Mine to Customer Destinations, 1967	73
GX 55—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 3 Mine to Customer Destinations, 1967	74

Government Exhibits:—Continued Page

GX 56— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 4 Mine to Customer Destinations, 1967 75

GX 57— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 5 Mine to Customer Destinations, 1967 76

GX 58— The United Electric Coal Companies; Shipments of Coal in Tons from the Banner Mine to Customer Destinations, 1967 77

GX 59— The United Electric Coal Companies; Shipments of Coal in Tons from the Cuba-Buckhart Mines to Customer Destinations, 1967 78

GX 60— The United Electric Coal Companies; Shipments of Coal in Tons from the Fidelity Mine to Customer Destinations, 1967 79

GX 61— Chart entitled "Total Coal Consumption in Tons in 1967 by Steam Electric Plants in the Eastern Interior Coal Province Sales Area and the Total Sales of Coal in Tons in 1967 from Mines located in the Eastern Interior Coal Province to Steam Electric Plants in the Eastern Interior Coal Province Sales Area" 80

GX 62— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1957 Calendar Year" 81

GX 63— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1958 Calendar Year" 82

GX 64— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1959 Calendar Year" 83

GX 65— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1960 Calendar Year" 84

GX 66— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1961 Calendar Year" 85

GX 67— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1962 Calendar Year" 86

GX 68— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1963 Calendar Year" 87

GX 69— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1964 Calendar Year" 88

GX 70— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1965 Calendar Year" 89

Government Exhibits:—Continued		Page
GX 71—	Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1966 Calendar Year"	90
GX 72—	Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1967 Calendar Year"	91
GX 73—	Chart entitled "Production of Coal in Illinois by the Top Two, the Top Four, and the Top Ten Producers, 1957-1967, and their Percentage of Total Production for These Years"	92
GX 74—	Chart entitled "Sales of Coal in Illinois by the Leading Companies and Their Subsidiaries in 1967 (From Mines Located in Eastern Interior Coal Province)"	93
GX 75—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1957"	94
GX 77—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1959"	96
GX 85—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1967"	98
GX 86—	Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky, 1957-1967"	100
GX 87—	Chart entitled "Acquisitions in the Eastern Interior Coal Province since 1954"	101
GX 88—	Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1965"	107
GX 89—	Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1966"	111
GX 90—	Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1967"	114
GX 91—	Chart entitled "Per Cent of Sales of Each Company to Identical Customer Facilities by The United Electric Coal Companies and Freeman Coal Mining Corporation for the Year 1965-1967"	117
GX 98—	Central Illinois Public Service Company letter to Department of Justice dated October 28, 1966	118

Government Exhibits:—Continued Page

GX 94— Illinois Power Company letter to Department of Justice dated October 17, 1966 121
GX 104— Central Illinois Electric and Gas Company letter to Department of Justice dated October 20, 1966 124
GX 135— March 26, 1970 Petition of Commonwealth Edison to form subsidiary 126
GX 200— United Electric Coal Companies, Board of Directors Minutes—1959 132
GX 201— United Electric Coal Companies, Board of Directors Minutes—1960 133
GX 210— Testimony of Jack Simon before Illinois Commerce Commission 134
GX 219— Keystone Coal Buyers Manual 1967 137
GX 232— Article entitled "The Energy Outlook", by Gerber and Netschert, entered in the IEEE Spectrum, June 1969 144
GX 233— Speech by J. Cordell Moore entitled "The Future Role of Fossil Fuels in Electric Power Generation," at the American Power Conference luncheon in 1968 167
GX 239— Article entitled "New Horizons for Coal—the Comeback Industry", by Robert E. Lee Hall, printed in *The Commercial and Financial Chronicle*, dated March 7, 1968 176
GX 247— Article entitled "Natural Gas Fiasco", printed in *Barron's*, October 13, 1969 189
GX 253— Article entitled "Nuclear Power Economics," 1968-1969 Report by Philip Sporn to the Joint Congressional Committee on Atomic Energy, reprinted in CCH ¶ 3043 194

Defense Exhibits:

DX 1— October 9, 1957 memorandum from Frank Kolbe to R. J. Hepburn re punch mining 197
DX 2— October 18, 1957 letter from J. M. Morris to Frank Kolbe re Northern States Power Company, Displacing gas with coal 198
DX 3— June 19, 1958 letter from A. J. Christiansen to A. H. Truax with three page attachment 199
DX 4— July 1, 1958 letter from J. M. Morris to Frank Nugent 204
DX 5— July 11, 1958 letter from R. J. Hepburn to Frank Kolbe with two page attachment 206
DX 6— August 4, 1958 letter from "President" to Mr. Justin Potter 209
DX 7— November 21, 1958 *Wall Street Journal* article "General Dynamics Seeks To Acquire Chicago Building Firm" 210

Defense Exhibits:—Continued		Page
DX 8—	December 11, 1958 letter from Geo. Robert Boller to F. F. Kolbe with one page attachment	212
DX 9—	February 5, 1959 letter from Frank Nugent to F. F. Kolbe	214
DX 11—	May 27, 1959 letter from R. J. Hepburn to F. F. Kolbe	215
DX 12—	October 2, 1959 Paul Weir Co. report to F. F. Kolbe	216
DX 13—	May 27, 1960 letter from T. H. Latimer to R. J. Hepburn	224
DX 14—	August 23, 1960 letter from J. M. Morris to C. Evans Parks, Iowa Southern Utilities Co.	226
DX 15—	September 7, 1960 letter from J. M. Morris to H. L. Mann	228
DX 16—	September 13, 1960 letter from H. L. Mann to J. M. Morris	229
DX 17—	November 15, 1961 letter from J. M. Morris to H. L. Mann	230
DX 18—	June 12, 1962 memorandum from R. J. Hepburn to J. M. Morris re Preliminary Report Sunshine Coal Property, Centerville, Iowa	231
DX 19—	November 30, 1962 letter from H. L. Mann to Robert J. Hepburn	235
DX 20—	December 10, 1962 letter from Robert J. Hepburn to H. L. Mann re Iowa Coal Field	237
DX 21—	March 8, 1963 letter from R. J. Hepburn to J. M. Aiken	238
DX 22—	May 19, 1964 letter to Frank Nugent enclosing one page draft letter to Arch Kraakevik of Illinois Power Co.	239
DX 23—	June 16, 1964 memorandum from Irving Crown to Frank Nugent with four page attachment	241
DX 24—	June 29, 1965 memorandum from J. M. Morris to R. H. Inman et al. re Industry field	246
DX 25—	October 27, 1965 letter from J. M. Morris to Frank Nugent with one page attachment	247
DX 26—	January 5, 1966 letter from Q. W. Wellington to J. M. Morris	249
DX 27—	March 8, 1966 memorandum from Dale H. Emling to J. M. Morris with two page attachment	250
DX 28—	March 14, 1966 letter from J. M. Morris to Frank Nugent	252
DX 29—	July 13, 1966 memorandum from D. H. Emling to R. H. Inman	253
DX 30—	July 29, 1966 memorandum from R. H. Inman to T. H. Latimer, et al.	254
DX 31—	August 9, 1966 memorandum from D. H. Emling and B. C. Jensen to R. H. Inman re Star Lake Field, McKinley County, New Mexico	255

Defense Exhibits:—Continued		Page
DX 32—	September 12, 1966 letter from J. Morris to Frank Nugent	256
DX 33—	October 18, 1966 memorandum between R. H. Inman and T. H. Latimer	257
DX 34—	July 31, 1967 letter from Jack A. Simon to Frank Nugent	259
DX 35—	September 31, 1968 four-page coal contract between UEC and Central Illinois Light Co.	262
DX 36—	September 5, 1969 letter from John Welsh, Caterpillar Tractor Co., to Reuben Hedlund re coal versus gas feasibility study	263
DX 37—	September 12, 1969 letter from John T. Cusack to Reuben L. Hedlund	264
DX 38—	1965 Annual Report Zeigler: Coke Company	267
DX 39—	1966 Annual Report Zeigler: Coke Company	270
DX 40—	1967 Annual Report Zeigler: Coke Company	272
DX 41—	1968 Annual Report Zeigler: Coke Company	274
DX 42—	Report to shareholders, three months ended March 31, 1969, Zeigler: Coke Company	278
DX 43—	Report to shareholders, six months ended June 30, 1969, Zeigler: Coke Company	281
DX 44—	Report to shareholders, nine months ended September 30, 1969, Zeigler: Coke Company	284
DX 45—	Statement by Assistant Attorney General Richard W. McLaren to the Cabinet Task Force on Oil Imports, August 8, 1969	287
DX 46—	The Answers of Plaintiff to Interrogatories of Defendants 1(a)-1(g), 1(j), 6-8, 13-15, 17, 18, 20, 21, 23, 26, 27, 30, 37, 44-46, 50, 51 and 54	295
DX 47—	May 29, 1969 letter from John T. Cusack to Reuben L. Hedlund	302
DX 48—	December 15, 1954 letter by George P. Harrington, President, Chicago, Wilmington and Franklin Coal Company to its stockholders	340
DX 49a—	Subpoena Questionnaire form and related court orders	345
DX 49—	Producer data exhibits, mine characteristics	397
DX 50—	Producer data exhibits, comparison of leading producers with other producers	411
DX 51—	Producer data exhibits, coal characteristics by producing districts	419
DX 52—	Producer data exhibits, overburden of strip mines and depth of deep mines	447
DX 53—	Consumer data exhibits, boiler specifications	458
DX 54—	Consumer data exhibits, types of sales by producing districts	461
DX 55—	Consumer data exhibit, analysis of consumption and production of coal by freight rate districts	462

Defense Exhibits:—Continued		Page
DX 56—	Government questionnaire data analysis of consumption and production of coal by freight rate districts	481
DX 57—	1960 utility use of Illinois coal	506
DX 58—	Coal sold under contract	508
DX 59—	Analysis of potential and actual use of fuels other than coal by coal consuming facilities	509
DX 60—	UEC coal reserve data: (a) Summary, UEC coal reserves as of December 31, 1969; (b) United Electric Coal Company's lands and reserve coal, July 31, 1958 through December 31, 1969; (c) Memos on changes in reserve tonnage 1958 through 1969; (d) Potential acquisitions	517
DX 61—	Coal reserves of listed companies in Illinois, Indiana and Western Kentucky 1968	577
DX 62—	Types of coal reserves held by listed companies in Illinois, Indiana and Western Kentucky 1968	578
DX 63—	United Electric Coal Company's committed and uncommitted reserves—by mines	579
DX 66—	May 21, 1968 letter from Wisconsin Electric Power to John T. Cusack	580
DX 67—	Attachments dated February 12, 1968, February 13, 1968, and February 23, 1968 to letter of May 24, 1968 from Corn Products to John Cusack	582
DX 68—	August 15, 1968 letter from Thompson, Hine & Florey to John Cusack	587
DX 69—	September 17, 1968 letter from General Portland Cement to Ronald Futterman	588
DX 70—	September 29, 1969 letter from Mississippi River Corporation to Hugo Sims	590
DX 71—	May 27, 1968 letter from Hall, Patterson, Taylor, McNicol & Marett to John Cusack	591
DX 72—	May 20, 1968 leter from Inland Steel Company to John Cusack with two page attachment	594
DX 73—	November 28, 1966 letter from Vulcan Materials to John Cusack	599
DX 74—	September 11, 1968 letter from River Cement Company to Edwin M. Zimmerman	600
DX 75—	January 24, 1969 letter from Missouri Portland Cement Company to John Cusack	603
DX 76—	December 23, 1966 letter from Norman, Englehardt, Zimmerman, Frankie & Lauritzen to Bertram Long with attachment	604
DX 77—	October 21, 1966 letter from CILCO to Bertram Long	607
DX 78—	September 22, 1969 letter from Missouri Portland Cement Company to Hugo Sims	608
DX 80—	Certified copy of respondent's Exhibit No. 184A-F received in evidence in FTC Dkt. 8765 in the matter of Kennecott Copper Corporation	610

Defense Exhibits:—Continued		Page
DX 81—	1968 Annual Report of Standard Oil Company (New Jersey)	617
DX 82—	Plaintiff's proposed findings of fact 5a, 5b, 5b(2), 5d(4) and 5e(3), *United States* v. *Standard Oil Company* (New Jersey et al.), Civ. No. 954-64, D. N.J. (1964)	623
DX 83—	Plaintiff's memorandum accompanying plaintiff's proposed findings of fact and conclusions of law, *United States* v. *Standard Oil Company* (New Jersey, et al.), Civ. No. 954-64, D. N.J. (1964)	626
DX 84—	Final judgment in *United States* v. *Peabody Coal Company et al.*, Civ. No. 67 C 1621 (N.D. Ill. 1967)	640
DX 85—	"Interfuel Competition and Changes in the Coal Industry Since World War II," report and statistics by Dr. Bruce C. Netschert	647
DX 86—	"Structure and Geography of the Electric Utility Market for Coal," report and statistics by Abraham Gerber	733
DX 87—	Report on coal reserves and deep mining by Paul Weir Company	751
DX 88—	"Availability of Economically Mineable Strip Reserves Within the State of Illinois," report by John E. Organ, Geologist	796
DX 89—	"Impact of Sulphur Oxide Regulations on Midwest Coal Markets," report by Seversky, Environmental Dynamics Research Associates	798
DX 90—	1969 Annual Report of Commonwealth Edison	866
DX 91—	Letter of January 17, 1969 from Preston Kavanagh to Security Analysts	884
DX 92—	Letter of December 4, 1969 from Preston Kavanagh to Security Analysts	886
DX 93—	Commonwealth Edison: Profile of No. 1, *Nucleonics Week*, April 4, 11, 18 (1968)	889
DX 94—	1968 Annual Report of Commonwealth Edison	905
DX 95—	"Edison Seek A-site Downstate," *Chicago Daily News*, March 9, 1970	907
DX 96—	Advertisement entitled "Nuclear Power for Chicago," *Chicago Daily News*, March 13, 1967	908
DX 97—	Advertisement entitled "Commonwealth Edison Reports on Chicago's Air Pollution Problem," *Chicago Sun Times*, July 11, 1969	909
DX 98—	Advertisement entitled "Commonwealth Edison Reports on Progress Toward Cleaner Air," *Chicago Sun Times*, August 27, 1969	910
DX 99—	Advertisement entitled "No Smoke. No Dirt. No Fumes," *Chicago Tribune*, February 8, 1970	911

Defense Exhibits:—Continued		Page
DX 100—	Advertisement entitled "You're Looking at 20,000 Tons of Smokeless, Fumeless 'Coal'," *Chicago Tribune*, March 3, 1970	912
DX 101—	"Coal Strip Mining—Is It Reaching a Peak?" by Hubert E. Risser, Illinois Geological Survey (September 18, 1968)	913
DX 102—	Report of the National Fuels and Energy Study Group to the Committee on Interior and Insular Affairs, United States Senate, 87th Congress, 2d Session (1962)	921
DX 103—	Comparison of Coal-Fired and Nuclear Power Plants for the TVA System, June, 1966	996
DX 104—	Letter of October 17, 1962 from Elmer Hill to Barton Gebhart	998
DX 105—	Letter of October 18, 1962 from Barton Gebhart to Elmer C. Hill with two page attachment	999
DX 107—	*Central Station Nuclear Plants*, AEC Division of Industrial Participation, March 30, 1970	1003
DX 108—	AEC Release N-2, January 13, 1970, re Status Report on U.S. Civilian Nuclear Power Plants	1008
DX 110—	Chart entitled "U.S. Utility Orders for Electric Generating Equipment"	1011
DX 111—	Letters of February 19 and 22, 1968 from Richard P. Ryan, General Counsel, Humble Oil and Refining Company to John T. Cusack	1012
DX 112—	Excerpt from Minutes of Meeting of Board of Directors of General Dynamics Corporation on September 30, 1966	1015
DX 113—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies on October 9, 1959, May 13, 1960, July 15, 1960, September 9, 1960, October 28, 1960, March 10, 1961, May 12, 1961, September 8, 1961, May 18, 1962, July 13, 1962, March 8, 1963, September 13, 1963, May 8, 1964, and August 12, 1966	1022
DX 114—	Proxy statement of The United Electric Coal Companies 1954, 1955, 1956, 1957, 1958, 1959, 1960	1041
DX 116—	Nuclear Power Briefing For The Coal Industry, September 29-30, 1966. USAEC	1042
DX 136—	Advertisement entitled "Caution: Commonwealth Edison is Hazardous to your Health", *Chicago Sun Times*, July 8, 1969	1085
DX 137—	Advertisement entitled "Before everyone runs out of breath talking about pollution, we're doing something to clear the air," *Chicago Sun Times*, December 12, 1969	1086
DX 138—	1969 Steam-Electric Plant Factor	1087

Defense Exhibits:—Continued Page

DX 144— Map entitled "Investor-Owned Electric Utility Service Areas" 1098
DX 145— Map entitled "Service Area, Dairyland Power Cooperative" 1099
DX 146— 1966 Annual Report, Union Electric Company 1100
DX 147— 1967 Annual Report, Union Electric Company 1102
DX 148— 1968 Annual Report, Union Electric Company 1103
DX 149— 1968 Annual Report, Northern States Power Company 1104
DX 150— "Fuels and Fuel Transport for Electric Energy," chapter 3 of "National Power Survey," a report by the Federal Power Commission (1964) 1107
DX 151— Article entitled "Chicago's Dirty Air—A Growing Peril," *Chicago Sun Times*, October 19, 1967 1120
DX 152— Article entitled "Antipollution, Antitrust Bills Are Signed by Gov. Ogilvie," *Chicago Sun Times*, June 26, 1969 1122
DX 153— Article entitled "Crackdown on Air Pollution!" *Chicago Sun Times*, July 14, 1969 1123
DX 154— Article entitled "Edison Cuts Use Of Coal, Reduces Air Pollution," *Chicago Sun Times*, November 11, 1969 1124
DX 155— Article entitled "8 Utilities Face Pollution Probe," *Chicago Sun Times*, November 13, 1969 1127
DX 156— Article entitled "Clean-Air Edicts Offered In Council; Dimout Suggested," *Chicago Sun Times*, November 18, 1969 1130
DX 157— Article entitled "Mikva Bill Would Make Air Pollution A Federal Offense," *Chicago Sun Times*, November 20, 1969 1134
DX 158— Article entitled "Pollution Fight—Edison Tells Coal Doubts," *Chicago Daily News*, December 1, 1969 1136
DX 159— Article entitled "'Black Diamond' Boom: Kleenburn Coal Mines Enjoy Demand Surge," *The Wall Street Journal*, January 7, 1970 1137
DX 160— Article entitled "Business Bulletin—A Special Background Report On Trends In Industry And Finance," *The Wall Street Journal*, March 19, 1970 1138
DX 161— Letter entitled "The News That Nobody Prints," *Mid-West Coal Producers Institute, Inc.* 1139
DX 162— Article entitled "New Ruckus On Foreign-Oil Imports To Pin Nixon Between Pollution Issue, Coal Groups," *The Wall Street Journal*, March 5, 1970 1141

Defense Exhibits:—Continued		Page
DX 163—	Article entitled "Commonwealth Edison Is Allowed To Import Low-Sulphur Fuel Oil—Hickel Says One-Year License Doesn't Establish New Policy; Coal Industry Fought Action," *The Wall Street Journal*, March 26, 1970	1143
DX 164—	Article entitled "The Real Meaning Of Alaskan Oil Finds," *U.S. News & World Report*, March 3, 1969	1144
DX 165—	Article entitled "Petroleum Prize—Oil Firms At North Slope Race For Data As Giant Lease Sale Bidding Approaches," *The Wall Street Journal*, May 2, 1969	1146
DX 166—	Article entitled "Jersey Standard Unit To Send Oil Tanker Through Northwest Passage In Test Run," *The Wall Street Journal*, June 4, 1969	1148
DX 167—	Article entitled "Three Oil Companies To Study Feasibility Of Building First Coast-To-Coast Pipeline," *The Wall Street Journal*, July 24, 1969	1149
DX 168—	Article entitled "Northern Natural Gas Plans Major Canada Pipeline—Cost Of System To Transport Canadian Gas To The U.S. Put At About $1.4 Billion—Government Approval Needed," *The Wall Street Journal*, April 1, 1969	1150
DX 169—	Article entitled "People Gas Unit Plans To Buy Midwest Area's First Gas From Canada," *The Wall Street Journal*, June 18, 1969	1151
DX 170—	Article entitled "Alberta Agency Backs Northern Natural On Bid To Export Gas To U.S. Midwest," *The Wall Street Journal*, December 17, 1969	1152
DX 171—	Article entitled "Consumers Power Announces Plans For Atomic Plant—Dow Chemical Will Be Chief Customer Of New Facility; Cost Put At $267 Million—Completion Is Slated In 1975," *The Wall Street Journal*, December 15, 1967	1153
DX 172—	Article entitled "Jersey Standard Joins List Of Companies To Make Nuclear Fuel—Subsidiary To Build Plant In 1970 In Washington State; Research Assigned To Battelle Institute," *The Wall Street Journal*, March 20, 1969	1154
DX 173—	Article entitled "In 1970: 23 Utilities Will Ask Bids On 29 Nuclear Units," *Nucleonics Week*, January 15, 1970	1155
DX 174—	Article entitled "The Anti-Atom Nuts," *Chicago Tribune*, January 20, 1970	1156
DX 175—	Article entitled "Consumers Power Announces Plans For New Plant—Pumped Storage Facility Set For 1973: Detroit Edison To Share Cost And Output—Outlay To Total $186 Million," *The Wall Street Journal*, November 28, 1967	1157

Defense Exhibits:—Continued Page

DX 176— Article entitled "FPC Aide Again Approves Con Edison Bid To Build Power Project; Protests Likely," *The Wall Street Journal*, August 7, 1968 ____ 1158

DX 177— Article entitled "TVA Plans To Start $155 Million Project At Raccoon Mountain—Plan Will Include 4 Reversible Pump-Turbine Units With Total Capacity Of 1.4 Million Kilowatts," *The Wall Street Journal*, January 19, 1970 ____ 1159

DX 178— Article entitled "Geophysics," *Time Magazine*, July 26, 1968 ____ 1160

DX 179— Article entitled "Earth's Own Power Source," *Chicago Daily News*, January 9, 1969 ____ 1161

DX 180— Article entitled "Burning Refuse To Be Used In 'Total Energy' Concept," *The Wall Street Journal*, June 23, 1969 ____ 1162

DX 181— Excerpt from transcript of Hearings before the Joint Committee on Atomic Energy, 99th Congress, 2d Session, on Participation by Small Electrical Utilities in Nuclear Power.—(Part 1-April 30-May 3, 1968), "Affiliation Is Fast Becoming A Necessity." ____ 1163

DX 182— Article entitled "New England Affiliation Slated —Utility Concerns Plan Affiliation," *New York Times*, June 12, 1968 ____ 1164

DX 183— Article entitled "Boards of Iowa P&L And Iowa-Illinois G&E Approve Merger Plan—New Entity, Iowa Energy Corp., Plans To Retire The 2 Utilities' Outstanding Preferred Shares," *The Wall Street Journal*, July 22, 1969 ____ 1165

DX 184— Article entitled "Ayrshire Collieries Asks Bids of 5 Firms—Coal Concern Invites Offers To Purchase Or Merge With It; Replies Expected Next Month," *The Wall Street Journal*, November 27, 1968 ____ 1166

DX 185— Article entitled "Ashland Oil Plans To Buy Or Lease Ayrshire Assets—Boards Vote Proposal That Includes The Sale Of Coal Royalties To Third Firm—Pact Involves $125 Million," *The Wall Street Journal*, January 22, 1969 ____ 1167

DX 186— Article entitled "Metal Climax, Ayrshire Sign Merger Accord—Acquisition Of Coal Producer By Metals Firm Valued At Minimum Of $62.6 Million—Boards And Holders To Vote," *The Wall Street Journal*, April 24, 1969 ____ 1168

Defense Exhibits:—Continued		Page
DX 187—	Advertisement entitled "Air Pollution Authorities Urge Use Of 'Clean-Burning' Natural Gas—Today, More and More Apartment Building Owners Are Turning To Gas Heat. Things Stay Cleaner Inside And Out," *Chicago Sun Times*, May 16, 1967	1169
DX 188—	Advertisement entitled "1977 The Year Our City Died." *Philadelphia Inquirer*, December 4, 1967	1170
DX 189—	Advertisement entitled "You Can Heat 2½ Houses With Modern Oil For What It Costs To Heat 1 House With Electricity!"	1171
DX 190—	Advertisement entitled "We're Helping Main Street Switch To Nuclear Power."	1172
DX 191—	Advertisement entitled "This Pollution Was Caused By Burning Money. How Much Of It Was Yours?" *Fortune*, March 1, 1968	1173
DX 192—	Advertisement entitled "What's Gas Energy Doing To Make Industry Nice To Be Near?" *American Gas Association, Inc.*	1174
DX 193—	Advertisement entitled "How Nuclear Science May Give America More Gas Energy." *American Gas Association, Inc.*	1175
DX 194—	Advertisement entitled "Boiler Conversion?"—"Get The 5 Advantages Gas Power-Type Burners Give You In Full Measure."—"Midco Converts An Apartment And The Service Staff Is Cut By 2/3." *American Gas Association, Inc.*	1176
DX 195—	Advertisement entitled "Who Offers You 24-Hour Plant Site Location Service On The 60-Mile Illinois Shore? Peoples Gas, Of Course." *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1177
DX 196—	Advertisement entitled "The Not-So-Brief Case For Complete Chicagoland Plant Site Information," *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1178
DX 197—	Advertisement entitled "The Perfect Salt Substitute," *American Natural Gas Company*	1179
DX 198—	Advertisement entitled "St. Louis' Tallest Office Building Will Be Total Energy All The Way," *The Wall Street Journal*, May 13, 1969	1180
DX 199—	Advertisement entitled "The Savings And Loan That Saves With Natural Gas," *American Gas Association, Inc.*	1181
DX 200—	Advertisement entitled "Natural Gas Energy . . . The Electrifier—Pretty Soon You May Be Making Your Own Electricity From Natural Gas."	1182

Defense Exhibits:—Continued Page

DX 201— Advertisement entitled "What Do You Call It? No Matter What You Call It There's A Lot More Coming From Natural Gas Energy—There's A *Lot* More Coming From Natural Gas Energy." *Northern Illinois Gas Company* 1184

DX 202— Advertisement entitled "Another Shopping Center Finds That Making It's Own Electricity Is The Best Buy.—Waukesha Gas Energy Systems Produce Electricity For Lighting, Heating And Cooling." *American Gas Association, Inc.* 1187

DX 203— Advertisement entitled "Sheraton-O'Hare Reduces Utility Costs Over 50%. Waukesha Gas Engines Produce Electricty, Cooling and Heating." *America Gas Association, Inc.* 1188

DX 204— Advertisement entitled "Shoppers Buy All Year Round In An Ideal Climate Created With Gas Total Energy." *American Gas Association, Inc.* 1189

DX 205— Advertisement entitled "School Board Chooses Gas Heat Over Electric And Saves Over $50,000. (That's Just On First Costs. So It's Just First Savings.)" *American Gas Association, Inc.* 1190

DX 206— Advertisement entitled "This New School Uses Gas Energy For Heating, Cooling And Electric Power And Saves $1,000 a Month." *American Gas Association, Inc.* 1191

DX 207— Advertisement entitled "Gas Produces All The Energy This High School Needs (Including Electricity) At A Projected Savings of $11,639 A Year," *Fortune*, May 1968 1192

DX 208— Advertisement entitled "Williams Hardware Buys All Of Its Electricity From The Gas Company. And Saves $14,000 A Year In The Bargain," *Fortune*, November 1968 1194

DX 209— Advertisement entitled "Introducing The Gas Guitar—The Switch To Gas Total Energy Is On," *Fortune*, May 15, 1969 1196

DX 210— Advertisement entitled "Gas Air Conditioning Is Like A Car That's Better Than Good." *Northern Illinois Gas Company* 1197

DX 211— Advertisement entitled "Turn On A Party With A Gas Grill And Gaslight—We Call It The Patio Pair . . . By Charmglow." 1198

DX 212— Advertisement entitled "Now. The Gas Self-Cleaning Oven. For Builders Who Like To Build Sales. Period. It's The Biggest, Wildest, Most Exciting Gas Industry Promotion Ever. Period. The Theme Is: The Gas Self-Cleaning Oven For People Who Like To Cook. Period." *American Gas Association, Inc.* 1199

Defense Exhibits:—Continued		Page
DX 213—	Advertisement entitled "Texas Gas Invites You To The Wireless House."	1200
DX 214—	Advertisement entitled "Here's The Story Of The Gas Fuel Cell. It's Electrifying." *American Gas Association, Inc.*	1201
DX 215—	"Nuclear Steam-Generation of Electricity: Its Implication for the Future of Coal Transport by Railway and Water," by John C. Spychalski, *ICC Practitioners' Journal*, (July-August, 1967)	1202
DX 216—	"The Story of Coal," *The Petroleum Situation* (October 27, 1969 and November 28, 1969)	1215
DX 218—	Chart entitled "The Prime Interest Rate, 1928-1968," *Chicago Daily News*, December 18, 1968	1223
DX 219—	Letter dated March 9, 1970 from V. H. Clark, Secretary-Treasurer, Electric Energy, Inc., to Reuben L. Hedlund	1224
DX 220—	Letter dated June 29, 1942 from Frank F. Kolbe to B. L. Slack	1225
DX 221—	Letter dated July 23, 1954 from Frank F. Kolbe to Herman G. Schenck	1226
DX 222—	Letter dated June 11, 1956 from Frank F. Kolbe to Nye F. Morehouse	1227
DX 223—	Brochure entitled "Taum Sauk, Union Electric's Pumped—Storage Hydro Plant."	1228
DX 224—	Press release, University of Chicago, January 19, 1970	1232
DX 225—	Letter dated May 25, 1960 from Ward B. Chamberlin, Jr., Office of Chief Counsel, General Dynamics Corporation to Robert A. Bicks, Acting Assistant Attorney General, Antitrust Division, Department of Justice and exhibit C thereto.	1233
DX 227—	November 1, 1963 Memorandum from R. H. Inman to R. J. Hepburn re Freeman analysis of Kerr Mine	1236
DX 228—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies of September, 1966, pages 4386-4389	1238
DX 229—	Form 250 Response to the Court-Ordered Subpoena Questionnaire for the Freeman Coal Mining Corporation	1242
DX 230—	April 13, 1970 letter from Mr. Allen Van Wyck, Chairman of the Board of Illinois Power Company, to Donald G. Kempf, Jr.	1244
DX 231—	April 14, 1970 letter from K. E. Bowen, President of Central Illinois Public Service Company, to Donald G. Kempf, Jr.	1245
DX 232—	Brochure entitled "Low Cost Electric Power and Dependability . . . Through MAPP"	1247
DX 233—	Brochure entitled "Mid-America Interpool Network—MAIN"	1249

Defense Exhibits:—Continued

		Page
DX 234—	1969 Annual Report of Illinois Power Company	1265
DX 235—	Article entitled "Shortage of Low-Sulphur Coal Hampers Electric Utilities in Antipollution Efforts," *The Wall Street Journal*, April 6, 1970	1269
DX 236—	April 1, 1970 letter from Marvin O. Young, Vice President and General Counsel for Peabody Coal Company, to Reuben L. Hedlund re coal reserves in McDonough, Schuyler, Adams, Brown and Hancock Counties (Illinois)	1278
DX 237—	Series of four tables: (1) "Fraction of Total Illinois Production of Leading Companies Other Than Peabody"; (2) "Average Production Per Company"; (3) "Changes in Concentration in Illinois Coal Production Since 1959"; (4) "Changes in Concentration in Illinois, Indiana, and Western Kentucky Since 1959"	1274
DX 238—	Telegram of March 5, 1970 from Stephen F. Dunn, President of the National Coal Association, to the President of the United States re foreign oil imports to Midwestern utilities	1278
DX 239—	Summary entitled "Proposed Plans of Compliance With Chicago Air Pollution Control Ordinance of Those Facilities for Which a Response to Court-Ordered Subpoena Questionnaire was Received"	1279
DX 240—	Excerpts from the Keystone Coal Buyer's Manual from the years 1961, 1963, and 1964	1282
DX 241—	Excerpt from the 1968 Annual Coal, Oil and Gas report of the Illinois Department of Mines and Minerals	1289
DX 242—	Letter to Department of Justice, Chicago, Illinois from R. E. Hartmann, Alpha Portland Cement Company, dated January 22, 1969	1291
DX 243—	Letter to John T. Cusack from Robert H. Gorske, General Counsel, Wisconsin Electric Power Company, dated May 21, 1968	1293
DX 252—	Letter to Mr. Reuben L. Hedlund from Clayton G. Ball, Chairman of the Board, Paul Weir Company, dated June 8, 1970	1295
DX 254—	"Abatement of Sulfur Oxide Emissions From Stationary Combustion Sources" prepared by *Ad Hoc* Panel on Control of Sulfur Dioxide from Stationary Combustion Sources, Committee on Air Quality Management Committees on Pollution Abatement and Control, Division of Engineering, National Research Council, 1970	1298
DX 257—	West Central Region Power Survey 1970-1990, A Report to the Federal Power Commission prepared by The West Central Regional Advisory Committee	1381

Deposition Exhibits: Page

Abrahamson Deposition Exhibit 1—Front Cover of 1967 Annual Report of Wisconsin Power & Light Company 1409
Abrahamson Deposition Exhibit 1A—Back page of 1967 Annual Report of Wisconsin Power & Light Company 1410
Beck Deposition Exhibit 1—Letter to Antitrust Division, Department of Justice, Chicago, Illinois, from C. V. Beck dated November 14, 1968 1411
Brazzale Deposition Exhibit 1—Document entitled "Heating Fuel Economic Analysis" for the Federal Office Building and United States Courthouse, Chicago, Illinois 1412
Burton Deposition Exhibit 1—Document entitled "Solicitation, Offer, and Award Contract GS-05S-4945" issued August 1, 1967 1413
Camicia Deposition Exhibit 1—Keystone's Map of the Coal Fields of the United States 1415
Gallagher Deposition Exhibit 3—Mineral Industry Surveys, Bituminous Coal and Lignite Distribution, Calendar Year 1967 1416
Griswold Deposition Exhibit 3—Report of the Secretary of Health, Education, and Welfare to the Congress of the United States entitled "Air Pollution by Federal Facilities" and dated January 1968 1456
Griswold Deposition Exhibit 4—Second Report of the Secretary of Health, Education, and Welfare to the United States Congress entitled "Air Pollution Abatement by Federal Facilities" and dated January 1969 1470
Griswold Deposition Exhibit 5—Document entitled "Operating Experience with Wet-Dolomite Scrubbing" by J. F. McLaughlin, Executive Assistant, Union Electric Co., St. Louis, Missouri, and J. Jonakin, Products Manager, Air Pollution Control Systems, Combustion Engineering, Inc., Windsor, Connecticut, presented at the Air Pollution Control Association Annual Meeting in New York City on June 22-26, 1969 1502
Jensen Deposition Exhibit 12—Memorandum from Burl C. Jensen to Mr. R. H. Inman dated June 7, 1965 1519
Jensen Deposition Exhibit 13—Memorandum from D. H. Emling and B. C. Jensen to Mr. R. H. Inman dated June 7, 1966 1521
Kolbe Deposition Exhibit 2—Annual Report of The United Electric Coal Companies 1956 1526
Kolbe Deposition Exhibit 4—Annual Report of The United Electric Coal Companies 1958 1530
Kolbe Deposition Exhibit 7—Annual Report of The United Electric Coal Companies 1961 1532
Kolbe Deposition Exhibit 12—Letter to Mr. W. B. Hillery, unsigned, by the President dated February 27, 1957 1538

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit 13—Memorandum from T. H. Latimer to Mr. F. F. Kolbe dated February 18, 1957 1534
Kolbe Deposition Exhibit 14—Letter from Frank Kolbe to Frank Nugent dated August 18, 1958 1536
Kolbe Deposition Exhibit 15—Letter from Frank Nugent to Frank Kolbe dated August 20, 1958 1537
Kolbe Deposition Exhibit 16—Profitability comparison between UEC and other coal mining companies (1959) 1538
Kolbe Deposition Exhibit 17—Memorandum from R. H. Inman to Mr. Frank F. Kolbe dated November 21, 1957 1541
Kolbe Deposition Exhibit 33—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated May 10, 1961 1542
Kolbe Deposition Exhibit 42—Annual Report of The United Electric Coal Companies 1939 1545
Kolbe Deposition Exhibit 51—Annual Report of The United Electric Coal Companies 1948 1547
Kolbe Deposition Exhibit 57—Annual Report of The United Electric Coal Companies 1954 1548
Kolbe Deposition Exhibit 59—Paul Weir Company Valuation of Physical Assets of UEC as of December 31, 1959 1549
Kolbe Deposition Exhibit 60—Document entitled "Regarding Need For Additional Stripping Equipment at Fidelity Mine" dated June 17, 1966 and signed by J. M. Morris 1562
Kolbe Deposition Exhibit 61—Contract and agreement between Alcoa and UEC dated September 5, 1956 1565
Kolbe Deposition Exhibit A—Comparison between Truax-Traer Coal Company and The United Electric Coal Companies 1571
Kolbe Deposition Exhibit E—Notebook entitled "Report on Proposed Merged Illinois Operations, Truax-Traer Coal Company, January, 1956" of Theron G. Gerow, Mining Consultant and Engineer 1587
Kolbe Deposition Exhibit L—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent 1628
Kolbe Deposition Exhibit N—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated October 3, 1955 1629
Kolbe Deposition Exhibit O—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated February 16, 1960 1631
Kolbe Deposition Exhibit S—United States Letters Patent No. 2,325,064, dated July 27, 1943, entitled "Explosive Composition, Robert W. Lawrence, Wilmington, Delaware, assignor to Hercules Powder Company, Wilmington, Delaware, a corporation of Delaware" 1634
Kolbe Deposition Exhibit T—Letter from Mr. LeRoy Keane, Assistant General Manager of Hercules Powder Company, to The United Electric Coal Companies dated June 27, 1956 1637
Kolbe Deposition Exhibit W-1—Letter from Frank Kolbe to Harry LaViers dated February 25, 1958 1639

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit W-2—Letter from Harry LaViers to Frank Kolbe dated March 6, 1958 1640
Kolbe Deposition Exhibit W-3—Letter from Harry LaViers to Frank Kolbe dated April 28, 1958 1641
Kolbe Deposition Exhibit X—Memorandum to Robert J. Hepburn from "President" dated December 3, 1957 1642
Kolbe Deposition Exhibit X-1—Letter from R. J. Hepburn to Frank Kolbe dated November 29, 1957 1642
Kolbe Deposition Exhibit X-2—Memorandum from T. H. Latimer to R. J. Hepburn dated November 25, 1957 1643
Kolbe Deposition Exhibit Y—Memorandum from T. H. Latimer to R. J. Hepburn dated November 7, 1955 1646
Kurtz Deposition Exhibit 8—Steam-Electric Plant Factors, 1968 Edition 1650
Kurtz Deposition Exhibit 9—Bituminous Coal Facts 1966 1656
Kurtz Deposition Exhibit 10—Bituminous Coal Facts 1968 1657
Latimer Deposition Exhibit 25—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated September 25, 1964 1662
Latimer Deposition Exhibit 38—Memorandum from T. H. Latimer to Mr. R. H. Inman dated July 19, 1966 1664
Latimer Deposition Exhibit 48—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated February 10, 1961 1665
Maguire Deposition Exhibit 1—General Dynamics Proxy Statement and Agreement and Plan of Merger with respect to Material Service Corporation dated November 24, 1959 1666
Maguire Deposition Exhibit 35—Excerpt from the Minutes of the Board of Directors of General Dynamics Corporation on September 30, 1966 1669
Middleton Deposition Exhibit 4—Control Techniques For Particulate Air Pollutants, United States Department of Health, Education and Welfare 1676
Morris Deposition Exhibit 3—Memorandum dated December 17, 1959 from R. J. Hepburn to Mr. J. M. Morris 1678
Morris Deposition Exhibit 4—Letter from Mr. John M. Morris to Mr. Frank Nugent dated January 10, 1966 1680
Morris Deposition Exhibit 5—Letter from J. M. Morris to Mr. Frank Nugent dated March 14, 1966 1682
Morris Deposition Exhibit 14—Letter dated May 3, 1965 from J. M. Morris to Mr. Frank Nugent 1683
Morris Deposition Exhibit 31—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated January 24, 1961 1686
Morris Deposition Exhibit 32—Memorandum from R. J. Hepburn to Mr. T. J. Tarry and Mr. J. M. Morris dated February 24, 1960 1688
Morris Deposition Exhibit 35—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated July 17, 1962 1689

Deposition Exhibits:—Continued Page

Morris Deposition Exhibit 38—Letter from Mr. R. J. Hepburn to Mr. John Davis dated February 3, 1960 1690
Morris Deposition Exhibit 42—Letter from Mr. J. M. Morris to Mr. Frank Nugent dated October 27, 1965 1691
Morris Deposition Exhibit 46—Memorandum from T. J. Tarzy to Mr. J. M. Morris dated February 14, 1961 1693
Morris Deposition Exhibit 47—Letter from T. H. Latimer to Mr. G. I. Grasty dated November 20, 1957 1694
Morris Deposition Exhibit 55—Letter from Mr. Frank Nugent to Mr. John Morris dated April 26, 1965 1695
Morris Deposition Exhibit 59—Letter from G. H. Utterback to Mr. Robert S. Overbeck dated November 29, 1962 1696
Morris Deposition Exhibit 60—Letter from Mr. R. S. Overbeck to Mr. G. H. Utterback dated December 13, 1962 1697
Morris Deposition Exhibit 61—Contract and Agreement between The United Electric Coal Companies and the Aluminum Company of America dated May 3, 1965 1699
Morris Deposition Exhibit 62—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent 1712
Morris Deposition Exhibit 70—Letter from J. M. Morris to Mr. Francis Stanley Jordan dated June 11, 1962 1713
Morris Deposition Exhibit 76—Memorandum from T. J. Tarzy to Mr. J. M. Morris dated February 15, 1961 1714
Nix Deposition Exhibit 1—Document entitled "Term Contract Ordering Data for: FSC Group 91 Fuels, FSC Class 9110—Coal, Veterans Administration Facilities and Federal Public Buildings, within the states of Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin" for the effective period of the date of award through June 30, 1968 1715
Nugent Deposition Exhibit 1—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1959 1741
Nugent Deposition Exhibit 2—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1960 1744
Nugent Deposition Exhibit 3—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1961 1747
Nugent Deposition Exhibit 4—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1962 1750
Nugent Deposition Exhibit 5—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1963 1753
Nugent Deposition Exhibit 6—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1964 1756

Deposition Exhibits:—Continued Page

Nugent Deposition Exhibit 7—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1965 ____ 1758

Nugent Deposition Exhibit 8—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1966 ____ 1760

Nugent Deposition Exhibit 9—Financial Reports: Freeman Coal Mining Corporaiton; Year Ended December 31, 1967 ____ 1762

Nugent Deposition Exhibit 11—Annual Report of the Chicago, Wilmington and Franklin Coal Company for the Year 1953 ____ 1764

Nugent Deposition Exhibit 16—Advertisement of Freeman Coal Mining Corporation in 1967 Keystone Coal Buyers Manual ____ 1766

Nugent Deposition Exhibit 17—Advertisement of The United Electric Coal Companies in the 1967 Keystone Coal Buyers Manual ____ 1768

Nugent Deposition Exhibit 19—Advertisement of The United Electric Coal Companies in the 1968 Keystone Coal Buyers Manual ____ 1770

Nugent Deposition Exhibit 20—Advertisement of The United Electric Coal Companies in February 1968 issue of *The Black Diamond* ____ 1772

Nugent Deposition Exhibit 22—Letter dated February 13, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Paid to MSC, Freeman, GD on the Stock of UEC, January 1, 1959 to December 27, 1967 ____ 1774

Nugent Deposition Exhibit 29—Annual Report of The United Electric Coal Companies 1964 ____ 1776

Nugent Deposition Exhibit 35—Invitation for Tenders of Common Stock of The United Electric Coal Companies by General Dynamics Corporation dated October 5, 1966 ____ 1786

Nugent Deposition Exhibit 38—Map entitled "Shipping Coal Mines In Illinois" prepared by Jack A. Simon, State of Illinois, Department of Registration and Education, State Geological Survey, dated January 1, 1966 ____ 1793

Nugent Deposition Exhibit 39—Letter from Tom Tarzy to Frank Nugent dated December 11, 1964 and Chart Showing Midwestern Coal Consumption by Utility Plants, 1963 ____ 1794

Nugent Deposition Exhibit 49—Minutes of The United Electric Coal Companies Board of Directors Meeting held October 28, 1960 re Capital Appropriation for UEC ____ 1796

Nugent Deposition Exhibit A—Letter from Frank Kolbe to Henry Crown dated October 9, 1956 ____ 1797

Deposition Exhibits:—Continued Page

Pedersen Deposition Exhibit 5—United Electric Coal Companies Computation of Provision for Federal Income Taxes, Month of October 1966 and Ten Months Ended October 31, 1966 1800
Redard Deposition Exhibit 1—Keystone Steel and Wire Company letter to Department of Justice dated April 26, 1968 1808
Simon Deposition Exhibit 1—Simon, J.A., An Evaluation of Illinois Coal Reserve Estimates, 1968 1810
Sloane Deposition Exhibit 1—Unsigned letter from the Secretary of the United Coal Companies to Mr. Robert S. Overbeck dated January 21, 1963 1821
Steiner Deposition Exhibit 1—VITA, Peter O. Steiner dated August, 1969 1823
Steiner Deposition Exhibit 2—*U.S.* v. *General Dynamics, et al.*, Memorandum of Expected Testimony of Peter O. Steiner, Professor of Economics and Law, University of Michigan dated August 14, 1969 1828
Terleke Deposition Exhibit 2—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1957-1958 1837
Terleke Deposition Exhibit 11—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1966-1967 1841
Weir Deposition Exhibit 1—Shipping Coal Mines (Map), Illinois, Indiana, West Kentucky. 1845
Weir Deposition Exhibit 8—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated August 5, 1959 1846
Weir Deposition Exhibit 19—Brochure entitled "Paul Weir Company" 1847

Table G - 1F

DEFENDANT'S EXHIBIT NO. 56

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN FULTON-PEORIA FREIGHT RATE DISTRICT

1. Utility Facilities Located in Fulton-Peoria Sales Area

Company	Facility	City	County	State
Illinois	Havana	Havana	Mason	Illinois
	Hennepin	Hennepin	Putnam	Illinois
CILCO	Edwards	Bartonville	Peoria	Illinois
	Liberty	Peoria	Peoria	Illinois
	Wallace	E. Peoria	Tazewell	Illinois
CIPS	Meredosia	Meredosia	Morgan	Illinois

2. Coal Consumption by Utility Facilities Located in Fulton-Peoria Sales Area

		Tons Consumed (000)		% of Total Consumption
Fulton-Peoria Production Consumed by Utilities in Sales Area		1984		80%
Consumption of Coal Produced in Other Prieght Rate Districts in Mining Districts 9, 10 & 11 1/				
Belleville	493		20%	
West Kentucky	1	494	*%	20%
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA		2478		100%

3. Fulton-Peoria Production Sold to Utilities

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	1984	34%
Sold to Commonwealth Edison	3794	65%
Sold to Other Utilities	28	1%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN FULTON-PEORIA FRT. DIST.	5806	100%

Source: Government Questionnaire

1/ Excludes shipment of 92,000 tons of dust from Crown Mine in Springfield District to Meredosia facility of CIPS. See CIPS Form 150 (Meredosia), Subpoena Questionnaire.

Table G - 2F

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE FULTON-PEORIA FREIGHT RATE DISTRICT

1. Destinations in Fulton-Peoria Sales Area

City	County	State
Abingdon	Knox	Illinois
Aledo	Mercer	Illinois
Alexis	Warren	Illinois
Altona	Knox	Illinois
Atkinson	Henry	Illinois
Bartonville	Peoria	Illinois
Beardstown	Cass	Illinois
Bishop Hill	Henry	Illinois
Bushnell	McDonough	Illinois
Cambridge	Henry	Illinois
Canton	Fulton	Illinois
Cedar Point	LaSalle	Illinois
Chillicothe	Peoria	Illinois
Colchester	McDonough	Illinois
Cuba	Fulton	Illinois
Dixon	Lee	Illinois
E. Moline	Rock Island	Illinois
E. Peoria	Peoria	Illinois
Edelstein	Peoria	Illinois
Edwards	Peoria	Illinois
Elmwood	Peoria	Illinois
Erie	Whitesdie	Illinois
Fairview	Fulton	Illinois
Farmington	Fulton	Illinois
Galesburg	Knox	Illinois
Galva	Henry	Illinois
Geneseo	Henry	Illinois
Gilchrist	Mercer	Illinois
Garden Plain	Whiteside	Illinois
Kewanee	Henry	Illinois
Knoxville	Knox	Illinois
Lacon	Marshall	Illinois
Lafayette	Stark	Illinois
LaSalle	LaSalle	Illinois
Laura	Peoria	Illinois
Lewistown	Fulton	Illinois
Liverpool	Fulton	Illinois
Lyndon	Whiteside	Illinois

Table G - 2F
Cont'd

City	County	State
Macomb	McDonough	Illinois
Manlius	Bureau	Illinois
Mapleton	Peoria	Illinois
Marseilles	LaSalle	Illinois
Mendota	LaSalle	Illinois
Metamora	Rock Island	Illinois
Milan	Rock Island	Illinois
Moline	Rock Island	Illinois
Monica	Peoria	Illinois
Monmouth	Warren	Illinois
Montgomery	Kane	Illinois
Morton	Tazewell	Illinois
Mossville	Peoria	Illinois
Mt. Sterling	Brown	Illinois
Normandy	Bureau	Illinois
Norris	Fulton	Illinois
Oglesby	LaSalle	Illinois
Osco	Henry	Illinois
Ottawa	LaSalle	Illinois
Pekin	Tazewell	Illinois
Peoria	Peoria	Illinois
Peoria Heights	Peoria	Illinois
Peru	LaSalle	Illinois
Port Byron	Rock Island	Illinois
Princeton	Bureau	Illinois
Princeville	Peoria	Illinois
Prophetstown	Whiteside	Illinois
Rapatee	Knox	Illinois
Rock Falls	Whiteside	Illinois
Rock Island	Rock Island	Illinois
Rushville	Schuyler	Illinois
St. David	Fulton	Illinois
Seneca	LaSalle	Illinois
S. Pekin	Tazewell	Illinois
Sparland	Marshall	Illinois
Sterling	Whiteside	Illinois
Stronghurst	Henderson	Illinois
Tiskilwa	Bureau	Illinois
Toulon	Stark	Illinois
Walnut	Bureau	Illinois
Warsaw	Hancock	Illinois
Washburn	Woodford	Illinois
Wenona	Marshall	Illinois
Williamsfield	Knox	Illinois
Woodhull	Henry	Illinois
Wyoming	Stark	Illinois

Table G - 2P
Cont'd

City	County	State
Bettendorf	Scott	Iowa
Buffalo	Scott	Iowa
Clinton	Clinton	Iowa
Davenport	Scott	Iowa
Muscatine	Muscatine	Iowa
Princeton	Cott	Iowa

2. Coal Consumption by Non-Utility Facilities Located in Fulton-Peoria Sales Area

	Tons Consumed (000)	% of Total Consumption
Fulton-Peoria Production Consumed by Non-Utilities in Sales Area	2371	81%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11		
Southern Illinois 251 1/		9%
Belleville 7		*%
Springfield 1		*%
West Kentucky 31		1%
Mineral-Atkinson 284	574	10%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA	2945	100% 2/

Source: Government Questionnaire

1/ Includes 73,000 tons (3%) of low-sulphur coal (1.2%) from Freeman's Orient #3 Mine in the Southern Freight District to the Dixon plant of Medusa Portland Cement for equipment requiring coal having a maximum sulphur content of 1.2%. See Medusa Portland Cement Form 150, Subpoena Questionnaire and letter of August 15, 1968 from Thompson, Hine and Flory to Plaintiff.

2/ The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

Table G - 2F
Cont'd

3. Fulton-Peoria Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	2371	64%
Sold to Greater Chicago Air Quality Control Region	1004	27%
Sold to Other Non-Utilities	336	9%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN FULTON-PEORIA PRT. DIST.	3711	100%

Source: Government Questionnaire

Table G - 3F

RECAPITULATION OF SALES OF
COAL PRODUCED IN THE FULTON-
PEORIA FREIGHT RATE DISTRICT

1. Coal Consumption by All Facilities in Fulton Peoria Sales Area

		Tons Consumed (000)		% of Total Consumption
Fulton-Peoria Production Consumed by All Facilities in Sales Area		4355		80%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11[1]				
Belleville	500		9%	
Southern Illinois	251		5%	
Springfield	1		*	
West Kentucky	32		1%	
Mineral-Atkinson	284	1068	5%	20%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		5432		100%

2. Fulton-Peoria Production Sold to All Facilities

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	4355	46%
Sold to Commonwealth Edison	3794	40%
Sold to Chicago Air Quality Control Region	1004	11%
Sold to Other Facilities	364	4%
TOTAL	9517	100%[2]

[1] Excludes shipment of 92,000 tons of dust from Crown Mine in Springfield District to Meredosia facility of CIPS.

Includes 73,000 tons (4%) of low-sulphur coal (1.2%) from Freeman's Orient #3 Mine in the Southern Freight District to the Dixon plant of Medusa Portland Cement for equipment requiring coal having a maximum sulphur content of 1.2%. See Medusa Portland Cement Form 150, Subpoena Questionnaire and letter of August 15, 1968 from Thompson, Hine and Flory to Plaintiff.

[2] The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent

Table G - 1s

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN SPRINGFIELD FREIGHT RATE DISTRICT

1. Utility Facilities Located in Springfield Sales Area

Company	Facility	County	State
CIPS	Coffeen	Montgomery	Illinois
SPRINGFIELD WL&P	Springfield	Sangamon	Illinois

2. Coal Consumption by Utility Facilities Located in Springfield Sales Area

	Tons Consumed (000)	% of Total Consumption
Springfield Production Consumed by Utilities in Sales Area	1406	100%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11	0	0%
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA	1406	100%

3. Springfield Production Sold to Utilities1/

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	1406	16%
Sold to Commonwealth Edison	7191	84%
Sold to Other Utilities	0	0%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN SPRINGFIELD FRT. DIST.	8597	100%

Source: Government Questionnaire

1/ Excludes 92,000 tons of dust shipped from the Crown Mine of Freeman to the Meredosia facility of CIPS. See CIPS Form 150 (Meredosia), Subpoena Questionnaire.

Table C - 2s

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE SPRINGFIELD FREIGHT RATE DISTRICT

1. Destinations in the Springfield Sales Area

City	County	State
Carlinville	Macoupin	Illinois
Decatur	Macon	Illinois
Edinburg	Christian	Illinois
Hillsboro	Montgomery	Illinois
Irving	Montgomery	Illinois
Kincaid	Christian	Illinois
Mechanicsburg	Sangamon	Illinois
Morrisonville	Christian	Illinois
Nokomis	Montgomery	Illinois
Oconee	Shelby	Illinois
Pana	Christian	Illinois
Pawnee	Sangamon	Illinois
Ramsey	Fayette	Illinois
Riverton	Sangamon	Illinois
Springfield	Sangamon	Illinois
Witt	Montgomery	Illinois

Table G - 2s
Cont'd

2. Coal Consumption by Non-Utility Facilities Located in Springfield Sales Area

		Tons Consumed (000)	% of Total Consumption
Springfield Production Consumed by Non-Utilities in Sales Area		349	80%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11			
Southern	4		1%
Murdock	63		14%
Danville	12		3%
Indiana	8		2%
W. Kentucky	2		*%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA		89	20%
		438	100%

3. Springfield Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	349	89%
Sold to Greater Chicago Air Quality Control Region	19	5%
Sold to Other Non-Utilities	24	6%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN SPRINGFIELD FRT. DIST.	392	100%

Source: Government Questionnaire

Table G-38

RECAPITULATION OF SALES OF COAL PRODUCED IN THE SPRINGFIELD FREIGHT RATE DISTRICT

1. Coal Consumed by All Facilities in Springfield Sales Area

		Tons Consumed (000)	% of Total Consumption
Springfield Production Consumed by All Facilities in Sales Area		1755	95%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11			
Southern	4		*
Murdock	63		3%
Danville	12		1%
Indiana	8		*
West Kentucky	2	89	*
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		1844	100%[1]

2. Springfield Production Sold to All Facilities[2]

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	1755	20%
Sold to Commonwealth Edison	7191	80%
Sold to Chicago Air Quality Control Region	19	*
Sold to Other Facilities	24	*
TOTAL	8989	100%

1/ The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

2/ Excludes 92,000 tons of dust shipped from the Crown Mine of Freeman to the Meredosia facility of CIPS. See CIPS Form 150 (Meredosia), Subpoena Questionnaire.

Source: Government Questionnaire

Table G - 1B

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN BELLEVILLE FREIGHT RATE DISTRICT

1. Utility Facilities Located in Belleville Sales Area

Company	Facility	City	County	State
Dairyland Power	Stoneman	Cassville	Clayton	Wisconsin
Dairyland Power	Alma	Alma	Wabasha	Wisconsin
Dairyland Power	Genoa	Genoa	Vernon	Wisconsin
Wisconsin P & L	Nelson Dewey	Cassville	Clayton	Wisconsin
Elk River Rural Co-operative	Elk River	Elk River	Sherburne	Minnesota
Northern Sts. Power	French Island	LaCrosse	LaCrosse	Wisconsin
Northern Sts. Power	Red Wing	Red Wing	Goodhue	Minnesota
Northern Sts. Power	Winona	Winona	Winona	Minnesota
Northern Sts. Power	King	Stillwater	Washington	Minnesota
Northern Sts. Power	High Bridge	St. Paul	Ramsey	Minnesota
Northern Sts. Power	Black Dog	Minneapolis	Ramsey	Minnesota
Northern Sts. Power	Riverside	Minneapolis	Ramsey	Minnesota
Interstate Power	Dubuque	Dubuque	Dubuque	Iowa
Interstate Power	Lansing	Lansing	Almakee	Iowa
Interstate Power	Kapp	Clinton	Muscatine	Iowa
Municipal Electric	Muscatine	Muscatine	Muscatine	Iowa
E. Iowa Light & Power	Montpelier	Montpelier	Muscatine	Iowa
Iowa-Ill. Gas & Elec.	Riverside	Bettendorf[Iowana]	Scott	Iowa
Ill. Power	Wood River	Wood River	Madison	Illinois
City of Highland	Highland	Highland	Madison	Illinois
Union Electric	Venice	Venice	Madison	Illinois
Union Electric	Cahokia	Cahokia	Sinclair	Illinois
Union Electric	Ashley	St. Louis	St. Louis	Missouri
Union Electric	Meramec	St. Louis	St. Louis	Missouri
Central Elec. Power Coop.	Chamois	Chamois	Callaway	Missouri

2. Coal Consumption by Utility Facilities Located in Belleville Sales Area

		Tons Consumed (000)		% of Total Consumption
Belleville Production Consumed by Utilities in Sales Area		7595		81%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Southern[1]	895		10%	20%
Fulton Peoria	4		*	
West Kentucky	453		5%	
Mineral-Atkinson	426	1778	5%	
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA		9373		100%[2]

Table G - 1B
(Cont'd)

3. Belleville Production Sold to Utilities

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	7595	46%
Sold to Commonwealth Edison	6514	39%
Sold to Greater Chicago Air Quality Control Region	1279	8%
Sold to Other Utilities	1296	8%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN BELLEVILLE FREIGHT DISTRICT	16684	100%

1/ Excludes 1,171,337 tons of dust from the following mines in the Southern Freight District to the following utility facilities: Sahara to the Cahokia (59,000) and Venice (76,000) plants of Union Electric; Old Ben No. 9 to the Venice (49,000) and Meramec (319,000) plants of Union Electric; Orient No. 3 to the Venice (112,369) and Meramec (191,828) plants of Union Electric, the Wood River (181,132) plant of Illinois Power and the Alma (53,911) plant of Dairyland Power; Orient No. 5 to the Alma (29,097) plant of Dairyland Power. See corresponding Forms 150, Subpoena Questionnaire.

2/ The apparent discrepancy between actual sum of the subtotal above and the total above is due to the rounding. Each figure has been rounded to the nearest one percent.

Source: Government Questionnaire

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF
COAL PRODUCED IN THE BELLEVILLE FREIGHT RATE DISTRICT

1. Destinations in Belleville Sales Area

City	County	State
Alton	Madison	Illinois
Belleview	Calhoun	Illinois
Belleville	St. Clair	Illinois
Chester	Randolph	Illinois
Collinsville	Madison	Illinois
E. Alton	Madison	Illinois
E. St. Louis	St. Clair	Illinois
Edwardsville	Madison	Illinois
Evansville	Randolph	Illinois
Freeburg	St. Clair	Illinois
Granite City	Madison	Illinois
Madison	Madison	Illinois
Marissa	St. Clair	Illinois
Mascoutah	St. Clair	Illinois
Millstadt	St. Clair	Illinois
Pinckneyville	Perry	Illinois
Prairie DuRocher	Randolph	Illinois
Roxanna	Madison	Illinois
Sand Cut	Madison	Illinois
Sauget	St. Clair	Illinois
Sparta	Randolph	Illinois
Staunton	Macoupin	Illinois
Steeleville	Randolph	Illinois
Swanwick	Perry	Illinois
Venice	Madison	Illinois
Willisville	Perry	Illinois
Wood River	Madison	Illinois
Berkeley	St. Louis	Missouri
Brentwood	St. Louis	Missouri
Clayton	St. Louis	Missouri
Crescent	St. Louis	Missouri
Hine	St. Louis	Missouri
Koch	St. Louis	Missouri
Prospect Hill	St. Louis	Missouri
St. Charles	St. Charles	Missouri
St. Louis	St. Louis	Missouri
Weldon	St. Charles	Missouri

(Cont'd)

2. Coal Consumption by Non-Utility Facilities Located in Belleville Sales Area

		Tons Consumed (000)		% of Total Consumption
Belleville Production Consumed By Non-Utilities in Sales Area		2027		94%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Southern	107		5%	
Indiana	1		*	
West Kentucky	15	123	1%	6%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA		2150		100%

3. Belleville Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	2027	63%
Sold to Greater Chicago Air Quality Control Region	763	24%
Sold to Other Non-Utilities	409	13%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN BELLEVILLE FREIGHT DISTRICT	3199	100%

Source: Government Questionnaire

Table G - 3B

RECAPITULATION OF SALES OF COAL PRODUCED IN THE BELLEVILLE FREIGHT RATE DISTRICT

1. Coal Consumption by All Facilities in Belleville Sales Area

		Tons Consumed (000)	% of Total Consumption
Belleville Production Consumed by All Facilities in Sales Area		9622	84%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11			
Southern Illinois[1]	1002		9%
Fulton-Peoria	4		*
Mineral-Atkinson	426		4%
West Kentucky	468		4%
Indiana	1	1901	* 17%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		11523	100%[2]

2. Belleville Production Sold to All Facilities

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	9622	48%
Sold to Commonwealth Edison	6514	33%
Sold to Chicago Air Quality Control Region	2042	10%
Sold to Other Facilities	1705	9%
TOTAL	19883	100%[2]

1/ Excludes 1,171,337 tons of dust from the following mines in the Southern Freight District to the following utility facilities: Sahara to the Cahokia (59,000) and Venice (76,000) plants of Union Electric; Old Ben No. 9 to the Venice (49,000) and Meramec (319,000) plants of Union Electric; Orient No. 3 to the Venice (112,369) and Meramec (191,828) plants of Union Electric, the Wood River (181,132) plant of Illinois Power and the Alma (53,911) plant of Dairyland Power; Orient No. 5 to the Alma (29,097) plant of Dairyland Power. See corresponding Forms 150, Subpoena Questionnaire.

2/ The apparent discrepancy between actual sum of the subtotal above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

ANALYSIS OF SALES TO ELECTRIC UTILITIES OF COAL PRODUCED IN SOUTHERN (ILLINOIS) FREIGHT RATE DISTRICT

1. Utility Facilities Located in Southern Sales Area

Company	Facility	City	County	State
TVA	Shawnee	Paducah	McCracken	Kentucky
State of Wis.P.Plt	Waupun	Waupun	Fond du Lac	Wisconsin
Wisc. P & L	Edgewater	Sheboygan	Sheboygan	Wisconsin
Wisc. E. P.	Port Washington	Port Washington	Ozaukee	Wisconsin
Wisc. E. P.	Oak Creek	Oak Creek	Milwaukee	Wisconsin
Wisc. E. P.	Lakeside	St. Francis	Milwaukee	Wisconsin
Wisc. Pub. Serv.	Weston	Green Bay	Brown	Wisconsin
Wisc. Pub. Serv.	Pulliam	Rothschild	Marathon	Wisconsin
Lake Sup.Dist.Pwr.	Bayfront	Ashland	Ashland	Wisconsin
Marshfield E & W	Wildwood	Marshfield	Wood	Wisconsin
Menasha E & W	Menasha	Menasha	Winnebago	Wisconsin
Electric Energy	Joppa	Joppa	Massac	Illinois
CIPS	Grand Tower	Grand Tower	Jackson	Illinois
So.Ill.Pow.Coop.	Marion	Marion	Williamson	Illinois
Union Electric	Sioux	W. Alton	St. Charles	Missouri
N.E.Mo.E.Pwr.Coop.	South River	Palmyra	Marion	Missouri
Ia. E. L. & P.	Sutherland	Marshalltown	Marshall	Iowa
Ia. E. L. & P.	6th St. Station	Cedar Rapids[Crandic]	Linn	Iowa
Ia. E. L. & P.	Iowa Falls	Iowa Falls	Hardin	Iowa
Ia. - Ill. Gas	Iowa City	Iowa City	Johnson	Iowa
Ia. Public Serv.	Maynard	Waterloo	Black Hawk	Iowa
Munic. P&L Dept.		Grundy Center	Grundy	Iowa
Spencer Mun.Util.		Spencer	Clay	Iowa
Munic.Light Plt.		Sibley	Osceola	Iowa
Cedar Falls Util.		Cedar Falls	Black Hawk	Iowa
Iowa So. Util.	Bridgeport	Eddyville	Wapello	Iowa
Webster City L&P	"	Webster City	Hamilton	Iowa
Austin Utilities		Austin	Mower	Minnesota
Interstate Power		Sherburn	Martin	Minnesota
Board of L & P	City of Marquette	Marquette	Marquette	Michigan

2. Coal Consumption by Utility Facilities Located in Southern Sales Area

	Tons Consumed (000)		% of Total Consumption	
Southern Production Consumed by Utilities in Sales Area		7232		48%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Belleville[1]/	619		4%	
Mineral-Atkinson	530		4%	
Murdock	91		1%	
West Kentucky[2]/	633		42%	
Indiana	32	7899	2%	53%
TOTAL CONSUMPTION BY UTILITIES IN SALES AREA		15131		100%[3]/

Table G - 180
(Cont'd)

3. Southern Production Sold to Utilities

	Tons Produced (000)	% of Total Production
Sold to Utilities in Sales Area	7232	80%
Sold to Commonwealth Edison	120	1%
Sold to Other Utilities	1753	19%
TOTAL PRODUCTION SOLD TO UTILITIES BY MINES IN SOUTHERN FREIGHT DISTRICT	9105	100%

1/ Includes (1) 213,000 tons (3%) from the Fidelity Mine of United Electric to the Shawnee plant of TVA in Paducah, Kentucky, shipped under a Freeman contract. In response to Form 150 of the Subpoena Questionnaire, TVA received no other Belleville Freight District coal. In response to the Government questionnaire, no other Belleville producer reported sales to TVA. See also, Nugent Dep. Tr. p. 235. (2) Also includes 132,000 tons (2%) from the Fidelity mine of United Electric to the Weston plant of Wisconsin Power & Light in Green Bay, Wisconsin shipped under a Freeman contract. See also Morrison Dep. Tr. p. 18.

2/ Included within West Kentucky total is a one-third allocation [185,805.90] of the 557,417.70 tons shipped in 1967 from Tab-Badgett Lakeview Mine to "T.V.A.'s Widow Creek, Gallatin, and Shawnee Plants." In the absence of any evidence to the contrary, one-third of the aggregate tonnage has been attributed as the portion shipped to the Shawnee Plant in the Southern Utility Sales Area.

3/ The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

4/ Excludes 1,171,337 tons of dust from various mines to Belleville sales area utilities. See Footnote 2, Table G-1B.

Source: Government Questionnaire.

Table G - 250

ANALYSIS OF SALES TO NON-UTILITY FACILITIES OF COAL PRODUCED IN THE SOUTHERN (ILLINOIS) FREIGHT RATE DISTRICT 1/

1. Destinations in Southern Sales Area

City	County	State
Carbondale	Jackson	Illinois
Grand Tower	Jackson	Illinois
Harrisburg	Saline	Illinois
Herrin	Williamson	Illinois
Joppa	Massac	Illinois
Marion	Williamson	Illinois
Metropolis	Massac	Illinois
Ordill	Williamson	Illinois
Pulley's Mill	Williamson	Illinois
Rosiclare	Hardin	Illinois
Shawneetown	Gallatin	Illinois
Stonefort	Saline	Illinois
Villa Ridge	Pulaski	Illinois
Alladin	Black Hawk	Iowa
Albert City	Buena Vista	Iowa
Albia	Monroe	Iowa
Ames	Story	Iowa
Bloomfield	Davis	Iowa
Cedar Falls	Black Hawk	Iowa
Cedar Rapids [Crandic]	Linn	Iowa
Coin	Page	Iowa
Des Moines	Polk	Iowa
Eddyville	Wapello	Iowa
Fairfield	Jefferson	Iowa
Fort Dodge	Webster	Iowa
George	Lyon	Iowa
Iowa City	Johnson	Iowa
Keosauqua	Van Buren	Iowa
Mason City	Cerro Gordo	Iowa
Montezuma	Poweshiek	Iowa
Monticello	Jones	Iowa
Newton	Jasper	Iowa
North English	Iowa	Iowa
Oakdale	Johnson	Iowa
Ocheyedan	Osceola	Iowa
Oelwein	Fayette	Iowa
Olin	Jones	Iowa
Oskaloosa	Mahaska	Iowa
Ottumwa	Wapello	Iowa
Sigourney	Keokuk	Iowa
Stanwood	Cedar	Iowa
Stockport	Van Buren	Iowa
Tama	Tama	

Table G - 2SO
(Cont'd)

City	County	State
Tipton	Cedar	Iowa
Vinton	Benton	Iowa
Washington	Washington	Iowa
Waterloo	Black Hawk	Iowa
W. Des Moines	Polk	Iowa
Adell	Sheyboygan	Wisconsin
Appleton	Outagamie	Wisconsin
Ashland	Ashland	Wisconsin
Biron	Wood	Wisconsin
Cudahy	Milwaukee	Wisconsin
Eden	Fond du Lac	Wisconsin
Green Bay	Brown	Wisconsin
Kaukauna	Outagamie	Wisconsin
Kenosha	Kenosha	Wisconsin
Kimberley	Outagamie	Wisconsin
Knowles	Dodge	Wisconsin
Manitowoc	Manitowoc	Wisconsin
Marinette	Marinette	Wisconsin
Marshfield	Wood	Wisconsin
Merrill	Lincoln	Wisconsin
Milwaukee	Milwaukee	Wisconsin
Mosinee	Marathon	Wisconsin
Nekoosa	Wood	Wisconsin
Oak Creek	Milwaukee	Wisconsin
Owen	Clark	Wisconsin
Pt. Edwards	Wood	Wisconsin
Racine	Racine	Wisconsin
Rhinelander	Oneida	Wisconsin
Rothschild	Marathon	Wisconsin
Sheboygan	Sheboygan	Wisconsin
South Milwaukee	Milwaukee	Wisconsin
Stevens Point	Portage	Wisconsin
Stratford	Marathon	Wisconsin
Thorpe	Clark	Wisconsin
Tomahawk	Lincoln	Wisconsin
Waupun	Dodge	Wisconsin
Wausau	Marathon	Wisconsin
West Allis	Milwaukee	Wisconsin
Weyauwega	Waupaca	Wisconsin
Winnebago	Winnebago	Wisconsin
Wisconsin Dam	Lincoln	Wisconsin
Wisconsin Rapids	Wood	Wisconsin
Gladstone	Delta	Michigan
Marquette	Marquette	Michigan
Menominee	Menominee	Michigan
Ontonagon	Ontonagon	Michigan
Albert Lea	Freeborn	Minnesota
Austin	Mower	Minnesota

Table G - 280
(Cont'd)

City	County	State
Blue Earth	Fairbault	Minnesota
Fairmont	Martin	Minnesota
Hayward	Freeborn	Minnesota
Windom	Cottonwood	Minnesota
Worthington	Nobles	Minnesota
Campbell	Dunklin	Missouri
Chaffee	Scott	Missouri
Dolly Siding	St. Francois	Missouri
Jackson	Cape Girardeau	Missouri
Kirksville	Adair	Missouri
Mosher	Ste. Genevieve	Missouri
Morehouse	New Madrid	Missouri
Poplar Bluff	Butler	Missouri
S. Troy	Lincoln	Missouri
Trenton	Grundy	Missouri
Louisiana	Pike	Missouri
Clarksville	Pike	Missouri
Hannibal	Marion	Missouri
Ste. Genevieve	Ste. Genevieve	Missouri
Cape Girardeau	Cape Girardeau	Missouri
Paducah [Chiles]	McCracken	Kentucky

2. Coal Consumption by Non-Utility Facilities Located in Southern Sales Area

		Tons Consumed (000)		% of Total Consumption
Southern Production Consumed by Non-Utilities in Sales Area		2739		69%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Fulton Peoria	47		1%	
Belleville	86		2%	
Mineral-Atkinson	57		1%	
West Kentucky	635		16%	
Indiana	400	1225	10%	30%
TOTAL CONSUMPTION BY NON-UTILITIES IN SALES AREA		3964		100%2/

(Cont'd)

3. Southern Production Sold to Non-Utilities

	Tons Produced (000)	% of Total Production
Sold to Non-Utilities in Sales Area	2739	44%
Sold to Greater Chicago Air Quality Control Region	1738	28%
Sold to Other Non-Utilities	1802	29%
TOTAL PRODUCTION SOLD TO NON-UTILITIES FROM MINES IN SOUTHERN FREIGHT DISTRICT	6279	100%

1/ Excluding sales of 1,931,092 tons of metallurgical coal from the Orient mines of Freeman, the Sahara mines of Sahara, Old Ben mine No. 21 and Zeigler mine No. 4.

2/ The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

Source: Government Questionnaire

Table G - 380

RECAPITULATION OF SALES OF COAL PRODUCED IN THE SOUTHERN (ILLINOIS) FREIGHT RATE DISTRICT

1. Coal Consumption by All Facilities in Southern Illinois Sales Area

		Tons Consumed (000)		% of Total Consumption
Southern Production Consumed by All Facilities in Sales Area		9971		52%
Consumption of Coal Produced in Other Freight Rate Districts in Mining Districts 9, 10 & 11				
Belleville[1]	705		4%	
Fulton-Peoria	47		*	
Mineral-Atkinson	587		3%	
Murdock	91		*	
West Kentucky[2]	6966		36%	
Indiana	728	9124	4%	47%
TOTAL CONSUMPTION OF COAL BY FACILITIES IN SALES AREA		19095		100%[3]

Table G - 350
(Cont'd)

2. Southern Production Sold to All Facilities[4/]

	Tons Produced (000)	% of Total Production
Sold to Facilities in Sales Area	9971	65%
Sold to Commonwealth Edison	120	1%
Sold to Chicago Air Quality Control Region	1738	11%
Sold to Other Facilities[5/]	3555	23%
TOTAL	15384	100%

1/ Includes (1) 213,000 tons (3%) from the Fidelity Mine of United Electric to the Shawnee plant of TVA in Paducah, Kentucky, shipped under a Freeman contract. In response to Form 150 of the Subpoena Questionnaire, TVA received no other Belleville Freight District coal. In response to the Government questionnaire, no other Belleville producer reported sales to TVA. See also, Nugent Dep. Tr. p. 235. (2) Also includes 132,000 tons (2%) from the Fidelity mine of United Electric to the Weston plant of Wisconsin Power & Light in Green Bay, Wisconsin shipped under a Freeman contract. See also Morrison Dep. Tr. p. 18.

2/ Included within West Kentucky total is a one-third allocation [185,805.90] of the 557,417.70 tons shipped in 1967 from Tab-Badgett Lakeview Mine to "T.V.A.'s Widow Creek, Gallatin, and Shawnee Plants." In the absence of any evidence to the contrary, one-third of the aggregate tonnage has been attributed as the portion shipped to the Shawnee Plant in the Southern Utility Sales Area.

3/ The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

4/ Excluding sales of 1,931,092 tons of metallurgical coal from the Orient mines of Freeman, the Sahara mines of Sahara, Old Ben mine No. 21 and Zeigler Mine No. 4.

5/ Excludes 1,171,337 tons of dust from various mines to Belleville sales area utilities. See Footnote 2, Table G-1B.

Table G - P

SALE OF COAL TO FACILITIES LOCATED IN THE METROPOLITAN CHICAGO AIR QUALITY CONTROL REGION[1/]

Coal Consumption by Facilities Located in Chicago Air Quality Control Region

FROM FREIGHT RATE DISTRICT:	Tons Consumed (000)	% of Total Consumption
Southern	1738	24%
Fulton-Peoria	1004	14%
Belleville	2042	28%
Springfield	19	*
Northern Illinois	542	7%
Indiana	1113	15%
West Kentucky	865	12%
Danville	38	1%
TOTAL CONSUMPTION	7361	100%[2/]

1/ The Metropolitan Chicago Interstate Air Quality Control Region, as designated 42 C.F.R. §81.14 (33 F. R. 17176, Nov. 20, 1968), consists of Lake, McHenry, Cook, Du Page, Kane and Will Counties in Illinois and Lake and Porter Counties in Indiana. Tonnage to Commonwealth Edison facilities has not been included.

2/ The apparent discrepancy between actual sum of the subtotals above and the total above is due to rounding. Each figure has been rounded to the nearest one percent.

Source: Government Questionnaire

Table G-X

RECAPITULATION OF SALES OF COAL PRODUCED AND CONSUMED IN SPECIFIED MARKETS
Tons
(000)

CONSUMED BY:	Fulton-Peoria PRODUCTION		Springfield PRODUCTION		Belleville PRODUCTION		Southern PRODUCTION		Other[a] PRODUCTION	TOTAL CONSUMPTION	
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	Tons	%
FREIGHT RATE DISTRICT											
Specified Utility Markets	1988	21%	1406	16%	8707	44%	8127	53%	8160	28,388	45%
Specified Non-Utility Markets	2418	25%	350	4%	2120	11%	3101	20%	1508	9,497	15%
Commonwealth Edison	3794	40%	7191	80%	6514	33%	120	1%	---	17,619	28%
Chicago Air Quality Control Region	1004	11%	19	*	2042	10%	1738	11%	2558	7,361	12%
										62,865	100%
										TOTAL PRODUCTION OF NAMED FRT. DISTRICTS. Tons	%
Total Production Consumed in Above Markets	9204	97%	8966	100%	19383	98%	13086	85%		50,639	94%
Production Consumed in Other Markets	313	3%	23	*	500	2%	2298	15%		3,134	6%
TOTAL	9517	100%	8989	100%	19883	100%	15384	100%		53,773	100%
Single Freight Rate District Percentage of the Total Production of Named Frt. Dists.	18%		17%		37%		29%			100%	

Source: Tables G-1F, 2F; G-1S, 2S; G-1B, G-1SO, 2SO

[a] From other Freight Rate Districts in MS , Districts 9, 10 and 11.

1960 UTILITY USE OF ILLINOIS COAL

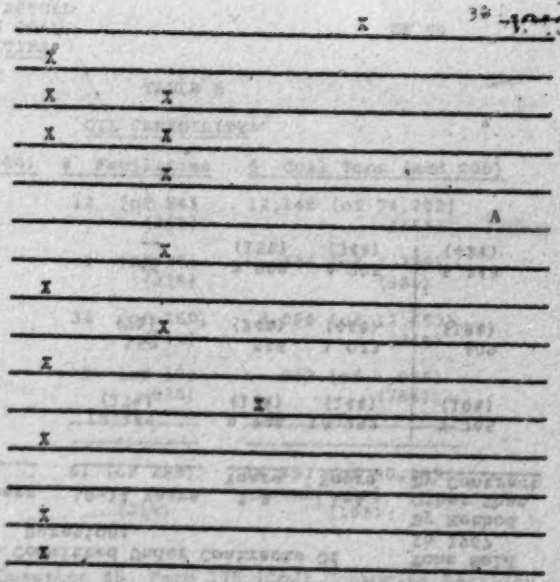
Total Tons ALL COAL Used	Name of Utility	Tons of ILLINOIS COAL Used	Prime Source of Supply: Southern Illinois	Belleville Du Quoin	Fulton County	Central Illinois	Others
10,044,000	Commonwealth Edison	8,182,000		X	X	X	
12,416,000	T.V.A.	3,280,000	X				
3,016,000	Union Electric	3,016,000		X			
2,151,000	Illinois Power	2,151,000	X	X	X		D
3,229,000	Electric Energy	1,440,000	X				
1,451,000	Central Ill. Public Service	1,451,000	X	X	X		
2,727,000	Wisconsin Electric Power	1,205,000	X				
1,246,000	Northern States Power	1,116,000		X			
840,000	Central Illinois Light	840,000			X		
1,178,000	No. Indiana Public Service	806,000	X	X			
606,000	Wisconsin Public Service	495,000	X				
449,000	Interstate Power	449,000		X			
561,000	Iowa Electric Light & Power	440,000			X		A
438,000	Dairyland Power Coop.	400,000		X			
733,000	Wisconsin Power & Light	333,000		X			
236,000	Central Ill Gas & Electric	236,000	X	X			
227,000	Iowa-Illinois Gas & Electric	227,000					A
1,243,000	Consumers Power	220,000	X		X		

198,000	Springfield, Ill.	198,000	
117,000	Lake Superior District Power	80,000	
64,000	NE Missouri Electric Power	64,000	
101,000	Iowa Public Service	82,000	
62,000	Central Elec Power-Chanois	62,000	
80,000	Muscatine, Iowa	80,000	
40,000	Hannibal, Mo.	40,000	
80,000	Upper Peninsula Power	40,000	
77,000	Missouri Utilities	35,000	
35,000	Manitowoc, Wis.	35,000	
4,032,000	Detroit Edison	18,000	
33,000	Mt. Carmel, Ill.	15,000	
1,317,000	Indiana & Michigan Electric	10,000	
29,000	Woodstock, Ill.	10,000	
27,000	Winnetka, Ill.	10,000	
49,816,000	Sub-total...	26,070,000	
	Miscellaneous	121,000	
	GRAND TOTAL ...	27,000,000	

1717

Total Illinois Sales Production for 1930 - 45,811,000

Utilities used 56.9% of Illinois Coal Produced-1930



507

DX 58

COAL SOLD UNDER CONTRACT
(1,000's of Tons)

Type Of Consumer	1967 Total Tons By Type	1967 Total Contract Tons	Annual Tonnage Committed Under Contracts Of Duration: 20 Years Or More	15-19 Years	10-14 Years	5-9 Years	1-4 Years	Tons Sold In 1967 By Method Other Than By Contract
Large Utilities	74,202 (100%)	66,497 (90%)	13,893 (19%)	20,120 (27%)	12,246 (17%)	9,986 (13%)	10,252 (14%)	7,705 (10%)
Small Utilities	2,329 (100%)	1,920 (82%)	0 (0%)	184 (8%)	157 (7%)	556 (24%)	1,023 (44%)	409 (18%)
Non-Utilities	13,752 (100%)	7,909 (58%)	598 (4%)	462 (3%)	45 --	2,099 (15%)	4,705 (34%)	5,843 (42%)

Source: Form 150, Subpoena Questionnaire.

ANALYSIS OF POTENTIAL AND ACTUAL
USE OF FUEL(S) OTHER THAN COAL
BY COAL CONSUMING FACILITIES

DX 59

Type of Consumer	TABLE A GAS CAPABILITY[1] # Facilities	TABLE A GAS CAPABILITY[1] # Coal Tons (add 000)	TABLE B OIL CAPABILITY[1] # Facilities	TABLE B OIL CAPABILITY[1] # Coal Tons (add 000)
LARGE UTILITIES:	38 [of 84] (45%)	23,281 [of 74,202] (31%)	12 [of 84] (14%)	12,148 [of 74,202] (16%)
SMALL UTILITIES:	5 [of 28] (18%)	385 [of 2,329] (17%)	6 [of 28] (21%)	886 [of 2,329] (38%)
MANUFACTURING FIRMS:	66 [of 160] (41%)	5,397 [of 12,657] (43%)	34 [of 160] (21%)	3,090 [of 12,657] (24%)
INSTITUTIONS:	5 [of 17] (29%)	264 [of 1,095] (24%)	9 [of 17] (53%)	833 [of 1,095] (76%)
TOTAL:	114 [of 289] (39%)	29,302 [of 90,283 total tons] (33%)	61 [of 289] (21%)	16,957 [of 90,283 total tons] (19%)

1/ Tables A and Table B are compilations of responses to Question #5, Form 175 [Coal Consuming Facility Questionnaire]. "Capability" to burn a given fuel other than coal exists if a particular facility is equipped to consume such fuel for any purpose, regardless of whether or not actual use occurred in 1967. The columns titled "# Tons" show the total tons of coal burned in 1967 at facilities which have the given capability. These tonnage figures are derived from responses to Form 150 of the Court-ordered Subpoena Questionnaire.

The distinction between the "Large Utilities" and "Small Utilities" is based upon a multi-dimensional comparison of the type of power system and the aggregate coal tonnage consumed within that system. Thus, the "Small" category consists of all co-operative and municipal power systems whose facilities consumed less than 500,000 tons of coal in the aggregate in 1967. The "Large" category consists of all corporate power companies, public and private, and all municipal or co-operative systems whose 1967 total coal consumption at all facilities combined was 500,000 tons or more.

TABLE C

GAS AND/OR OIL CAPABILITIES[2/]

	# Facilities	# Coal Tons (add 000)
LARGE UTILITIES	46 [of 84] (55%)	33,182 [of 74,202] (45%)
SMALL UTILITIES	9 [of 28] (32%)	1,157 [of 2,329] (50%)
MANUFACTURING FIRMS	73 [of 160] (46%)	5,873 [of 12,657] (46%)
INSTITUTIONS	11 [of 17] (65%)	877 [of 1,095] (80%)
TOTAL:	139 [289] (48%)	41,089 [90,283] (46%)

2/ Table C shows the number of facilities with gas, oil, or gas and oil capabilities. Thus, facilities with both gas and oil capabilities have been counted only once.

TABLE D

FREQUENCY DISTRIBUTION OF ACTUAL GAS USAGE - 1967[3/]

[Number of Facilities]

	1-2 Months	3-5 Months	6-12 Months	Special Purposes	No Actual Use
LARGE UTILITIES [38 facilities]	X (0)	3 (8%)	30 (79%)	1 (3%)	4 (11%)
SMALL UTILITIES [5 facilities]	X (0)	1 (20%)	3 (60%)	X (0)	1 (20%)
MANUFACTURING [66 facilities]	X (0)	7 (11%)	42 (64%)	6 (9%)	11 (17%)
INSTITUTIONAL [5 facilities]	X (0)	2 (40%)	3 (60%)	X (0)	X (0)

3/ Table D is a compilation of responses to Question 6, Form 175 [Coal Consuming Facility Questionnaire]. The above groupings reflect actual natural gas usage in terms of months for the year 1967 by coal consuming facilities for which a response to the Subpoena Questionnaire was received, and a gas capability there indicated. "Special purposes" is the designation assigned for actual use solely for the purposes of start-up, peaking, or emergency. The percentages in parentheses are based upon the total number of facilities which have the capability to burn gas.

TABLE D-1

FREQUENCY DISTRIBUTION OF ACTUAL GAS USAGE - 1967[4/]

[Number of Tons of Coal]
(add 000)

	1-2 Months	3-5 Months	6-12 Months	Special Purposes	No Actual Use
LARGE UTILITIES [23,281 tons]	X (0)	3,056 (13%)	19,025 (82%)	550 (2%)	650 (3%)
SMALL UTILITIES [385 tons]	X (0)	131 (34%)	201 (52%)	X (0)	53 (14%)
MANUFACTURING FIRMS [12,657 tons]	X (0)	354 (7%)	3,718 (69%)	347 (6%)	978 (18%)
INSTITUTIONS [264 tons]	X (0)	170 (64%)	94 (36%)	X (0)	X (0)

4/ Table D-1 is a compilation of responses to Question 6, Form 175 [Coal Consuming Facility Questionnaire. The tonnage figures represent the aggregate tons of coal purchased in 1967 for facilities actually using natural gas in the above frequencies, stated in terms of months for the year 1967. The percentages in parentheses are based upon the total number of tons of coal consumed in 1967 at facilities having the capability to burn gas. [All tonnage figures are derived from responses to Form 150 of the Questionnaire.]

TABLE E

FREQUENCY DISTRIBUTION OF ACTUAL OIL USAGE - 1967[5/]

[Number of Facilities]

	1-2 Months	3-5 Months	6-12 Months	Special Purposes	No Actual Use
LARGE UTILITIES [12 facilities]	X (0)	X (0)	4 (33%)	4 (33%)	4 (33%)
SMALL UTILITIES [6 facilities]	1 (17%)	X (0)	X (0)	1 (17%)	4 (67%)
MANUFACTURING FIRMS [34 facilities]	1 (3%)	5 (15%)	10 (29%)	8 (24%)	10 (29%)
INSTITUTIONS [9 facilities]	X (0)	1 (11%)	1 (11%)	2 (22%)	5 (56%)

5/ Table E is a compilation of responses to Question 6, Form 175 [Coal Consuming Facility Questionnaire]. The above groupings reflect actual oil usage in terms of months for the year 1967 by coal consuming facilities for which a response to the Subpoena Questionnaire was received and an oil capability there indicated. "Special purposes" is the designation assigned for actual use solely for the purposes of start-up, peaking, or emergency. The percentages in parentheses are based upon the total number of facilities which have an oil capability.

TABLE E-1

FREQUENCY DISTRIBUTION OF ACTUAL OIL USAGE - 1967[6/]

[Number of Tons of Coal]
(add 000)

	1-2 Months	3-5 Months	6-12 Months	Special Purposes	No Actual Use
LARGE UTILITIES [12,148 tons]	X (0)	X (0)	2,507 (21%)	7,474 (62%)	2,167 (18%)
SMALL UTILITIES [886 tons]	114 (13%)	X (0)	X (0)	140 (16%)	632 (71%)
MANUFACTURING FIRMS [3,090 tons]	101 (3%)	244 (8%)	1,464 (47%)	552 (18%)	729 (24%)
INSTITUTIONS [833 tons]	X (0)	50 (6%)	80 (10%)	358 (43%)	345 (41%)

6/ Table E-1 is a compilation of responses to Question 6, Form 175 [Coal Consuming Facility Questionnaire]. The tonnage figures represent the aggregate tons of coal purchased in 1967 for facilities actually using oil in the above frequencies, stated in terms of months, for the year 1967. The percentages in parentheses are based upon the total number of tons of coal consumed in 1967 at facilities having the capability to burn oil. [All tonnage figures are derived from responses to Form 150 of the Questionnaire.]

TABLE F

Facilities [and the Corresponding Tons of Coal Purchased at Those Facilities in 1967] Equipped to Burn Gas for Each and Every Purpose for Which Coal Was Burned in 1967 7/

	# of Facilities	# of Coal Tons
LARGE UTILITIES	37 (of 38) (97%)	22,852 (of 23,281) (98%)
SMALL UTILITIES	5 (of 5) (100%)	385 (of 385) (100%)
MANUFACTURING FIRMS	52 (of 66) (79%)	3,921 (of 5,397) (73%)
INSTITUTIONS	4 (of 5) (80%)	184 (of 264) (70%)

7/ Tons are rounded to Nearest 1,000. In the column headed "# of Facilities", the percentages in parentheses represent the ratio of the number of facilities equipped to burn gas for all of the purposes for which coal was burned in 1967 to the total number of all facilities with a gas capability. In the column headed "# of Coal Tons", the percentages in parentheses represent the ratio of the aggregate number of tons purchased by facilities which are equipped to burn gas for every purpose for which coal was burned in 1967 to the total number of tons of coal purchased by all facilities with a gas capability.

TABLE G

Facilities [and the Corresponding Tons of Coal Purchased at Those Facilities in 1967] Equipped to Burn Oil for Each and Every Purpose for Which Coal was Burned in 1967[8/]

	# of Facilities	# of Coal Tons
LARGE UTILITIES	10 [of 12] (92%)	11,946 [of 12,148] (98%)
SMALL UTILITIES	6 [of 6] (100%)	886 [of 886] (100%)
MANUFACTURING FIRMS	27 [of 34] (79%)	1,917 [of 3,090] (62%)
INSTITUTIONS	7 [of 9] (78%)	584 [of 833] (70%)

8/ Tons are rounded to Nearest 1,000. In the column headed "# of Facilities", the percentages in parentheses represent the ratio of the number of facilities equipped to burn oil for all of the purposes for which coal was burned in 1967 to the total number of all facilities with an oil capability. In the column headed "# of Coal Tons", the percentages in parentheses represent the ratio of the aggregate number of tons purchased by facilities which are equipped to burn oil for every purpose for which coal was burned in 1967 to the total number of tons of coal purchased by all facilities with an oil capability.

THE UNITED ELECTRIC COAL COMPANIES
COAL RESERVE DATA

DX 60

(A) SUMMARY

	UEC COAL RESERVES AS OF DECEMBER 31, 1969
RESERVES DEDICATED TO EXISTING MINES	
CUBA, Fulton County, Illinois (Strip)	1,206,260
FIDELITY, Perry County, Illinois (Strip)	18,365,390
BUCKHEART AND NORTH CANTON, Fulton County, Illinois (Strip)	27,379,963
BANNER, Fulton and Peoria Counties, Illinois (Strip)	5,081,691
	52,033,304
UNDEVELOPED OR ISOLATED RESERVES	
Illinois Strip Reserves	
Industry Field Strip Reserves (McDonough County, Illinois)	12,550,457
Miscellaneous Illinois Strip Reserves	2,059,552
	14,610,009
Out-of-State Strip Reserves	
Oklahoma Strip Reserves	2,301,872
Colorado Strip Reserves	12,522,000
	14,823,872
Deep Reserves	
Fidelity Mine Deep Reserves	5,347,246
Round Prairie Field Deep Reserves (Perry and Washington Counties, Ill.)	44,251,574
Vermillion County, Illinois Deep Reserves	1,795,360
	51,394,180
Total Illinois Reserves	118,037,493
Total All Reserves	132,861,365

Source: The United Electric Coal Companies Lands and Reserve Coal and Depletion Schedule as of December 31, 1969.

(B) RESERVES 1958 - 1969

THE [illegible] ELECTRIC COAL COMPANIES
[illegible] & [illegible] COAL
AS OF DECEMBER 31, 1969

PAGE NO.	STRIP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	ESTIMATED RESERVE COAL COAL ACRES	ESTIMATED RESERVE COAL TONS	STATUS
1, 2 & 3	Mine No. 9 - Cuba - Fulton County, Illinois	8,446.16	237.30	1,806,360	Active - Mining - Strip
4, 5, 6, 7, & 8	Mine No. 11 - Fidelity - Perry County, Illinois	11,510.69	3,297.35	18,369,390	Active - Mining - Strip
8 & 9	Elkhab Field - Fidelity - Perry County, Illinois	1,360.36	-	-	Active - Mining - Strip
10 & 11	Mine No. 17 - North Buckheart - Fulton County, Illinois	9,739.50	690.79	5,798,374	Active - Mining - Strip
11, 12, 13, & 14	Mine No. 17 - South Buckheart - Fulton County, Illinois	8,113.50	1,546.37	10,295,423	Active - Mining - Strip
15	Mine No. 23 - Hoxy Haven - Vermilion County, Illinois	180.51	-	-	Inactive - Completed - 1963
16	Mine No. 27 - Banner - Fulton & Peoria Counties, Illinois	4,898.78	1,499.04	9,981,891	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	40,373.44	6,511.07	48,477,338	
17 & 18	North Canton Field - Fulton County, Illinois	9,737.36	2,288.67	11,355,966	Inactive - Strip
19	Industry Field - McDonough & Schuyler Counties, Illinois	9,342.50	3,660.10	18,350,457	Inactive - Strip
20	East Liverpool - Fulton County, Illinois	160.00	103.20	344,842	Inactive - Strip
20	Coyle Field - Perry County, Illinois	350.96	221.43	1,716,750	Inactive - Strip
21	Hayden Field - Routt County, Colorado	5,957.47	712.60	12,581,000	Inactive - Strip
21	LeFlore County, Oklahoma	1,000.00	582.50	2,381,672	Inactive - Strip
	TOTAL - INACTIVE - MINING	10,536.39	7,317.49	46,780,847	
	GRAND TOTAL - STRIP RESERVES	50,899.73	14,028.65	81,447,185	

THE [illegible] ELECTRIC COAL COMPANIES
[illegible] OF [illegible] COAL
AS OF [illegible] 1, 1969

PAGE NO.	DEEP RESERVES	ESTIMATED RECOVERY COAL: WHOLE ACRES	COAL ACRES	TONS	REMARKS
21 & 22	Mine No. 11 - Fidelity - Perry County, Illinois	1,336.76	961.00	5,347,866	Inactive - Deep
23, 24 & 25	Round Prairie Field - Perry & Washington Counties, Illinois	7,399.76	7,316.76	43,805,772	Inactive - Deep
	TOTAL - INACTIVE - DEEP	8,736.52	8,258.68	49,153,638	
25	Round Prairie Field - Perry & Washington Counties, Illinois	109.00	109.00	449,881	Inactive - Isolated - Deep
25	Mine No. 11 - Buffalo Creek - Hopkins County, Kentucky	144.00	0.30	-	Inactive - Isolated - Deep
26	Hunsto Property - Vermilion County, Illinois	313.00	310.00	1,590,000	Inactive - Isolated - Deep
26	Swaller Property - Vermilion County, Illinois	50.00	50.00	263,280	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED	616.00	661.30	2,303,161	
	GRAND TOTAL - DEEP RESERVES	9,361.30	8,719.98	51,396,160	
	TOTAL STRIP RESERVES	36,809.72	34,648.95	81,447,185	
	TOTAL DEEP RESERVES	9,361.30	8,719.98	51,396,160	
	GRAND TOTAL - RESERVES	46,171.02	43,368.93	132,843,345	

THE UNITED ELECTRIC COAL COMPANIES
[illegible]
[illegible]

PAGE NO.	STRIP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
1, 2 & 3	Mine No. 9 - Oak - Fulton County, Illinois	6,431.59	396.46	3,150,879	Active - Mining - Strip
4, 5, 6 & 7	Mine No. 11 - Fidelity - Perry County, Illinois	11,017.90	2,103.57	17,000,400	Active - Mining - Strip
8 & 9	Clinch Field - Fidelity - Perry County, Illinois	1,343.29	69.37	660,583	Active - Mining - Strip
10 & 11	Mine No. 17 - North Buckhart - Fulton County, Illinois	5,739.51	1,085.33	6,717,383	Active - Mining - Strip
11, 12, 13 & 14	Mine No. 17 - South Buckhart - Fulton County, Illinois	8,115.30	1,661.96	10,878,099	Active - Mining - Strip
15	Mine No. 25 - Mary Moore - Vermilion County, Illinois	160.51	-	-	Inactive - Completed - 1965
16	Mine No. 27 - Banner - Fulton & Peoria Counties, Illinois	4,993.72	1,910.88	4,850,493	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	39,839.69	7,176.46	44,360,837	
17 & 18	North Canton Field - Fulton County, Illinois	5,737.36	2,238.67	11,369,966	Inactive - Strip
19	Industry Field - McDonough & Schuyler Counties, Illinois	5,361.56	3,668.10	13,950,457	Inactive - Strip
20	East Liverpool - Fulton County, Illinois	140.60	105.22	364,842	Inactive - Strip
20	Coyle Field - Perry County, Illinois	358.96	223.45	1,716,710	Inactive - Strip
21	Hayden Field - Routt County, Colorado	5,037.47	713.60	12,582,000	Inactive - Strip
21	LaFlore County, Oklahoma	1,020.00	562.00	1,301,872	Inactive - Strip
	TOTAL - INACTIVE - MINING	18,536.19	7,517.92	40,769,847	
	GRAND TOTAL - STRIP RESERVES	58,375.88	14,694.38	85,130,684	

THE UNITED ELECTRIC COAL COMPANIES
AREAS & ESTIMATED COAL
AS OF DECEMBER 31, 1966

PAGE NO.	BRIEF DESCRIPTION	ESTIMATED RESERVE COAL TOTAL ACRES	ESTIMATED RESERVE COAL COAL ACRES	ESTIMATED RESERVE COAL TONS	REMARKS
21 & 22	Mine No. 11 - Fidelity - Perry County, Illinois	1,336.78	941.88	5,347,366	Inactive - Deep
23, 24 & 25	Round Prairie Field - Perry & Washington Counties, Illinois	7,439.74	7,356.74	44,043,333	Inactive - Deep
	TOTAL - INACTIVE - DEEP	8,776.52	8,298.62	49,390,579	
25	Round Prairie Field - Perry & Washington Counties, Illinois	109.00	109.00	645,801	Inactive - Isolated - Deep
25	Mine No. 11 - Buffalo Creek - Hopkins County, Kentucky	144.00	2.30	-	Inactive - Isolated - Deep
26	Muncie Property - Vermilion County, Illinois	313.00	310.00	1,550,000	Inactive - Isolated - Deep
26	Outlaw Property - Vermilion County, Illinois	40.00	40.00	245,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED	606.00	461.30	2,241,161	
	GRAND TOTAL - DEEP RESERVES	9,385.32	8,759.92	51,630,740	
	TOTAL STRIP RESERVES	58,375.98	14,664.58	85,150,686	
	TOTAL DEEP RESERVES	9,385.32	8,759.92	51,630,740	
	GRAND TOTAL - RESERVES	67,761.30	23,424.50	136,781,426	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF DECEMBER 31, 1967

PAGE NO.		ESTIMATED RESERVE COAL			REMARKS
		TOTAL ACRES	COAL ACRES	TONS	
1, 2 & 3	Mine No. 9 - Cuba - Fulton County, Illinois	8,254.93	605.06	3,719,654	Active - Mining - Strip
4, 5, 6 & 7	Mine No. 11 - Fidelity - Perry County, Illinois	10,932.30	2,364.39	19,195,050	Active - Mining - Strip
8 & 9	Clinch Field - Fidelity - Perry County, Illinois	1,360.26	84.28	781,200	Active - Mining - Strip
10 & 11	Mine No. 17 - North Buckheart - Fulton County, Illinois	5,739.52	1,160.14	7,605,830	Active - Mining - Strip
11, 12 & 13	Mine No. 17 - South Buckheart - Fulton County, Illinois	8,113.30	1,727.31	11,325,366	Active - Mining - Strip
14	Mine No. 25 - Mary Moore - Vermilion County, Illinois	65.21	-	-	Inactive - Completed - 1965
15 & 16	Mine No. 27 - Banner - Fulton & Peoria Counties, Illinois	4,992.78	2,160.70	6,664,992	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	39,488.30	8,001.88	49,492,092	
17 & 18	North Canton Field - Fulton County, Illinois	5,737.36	2,228.67	11,355,966	Inactive - Strip
19	Industry Field - McDonough & Schuyler Counties, Illinois	5,342.50	3,668.10	12,550,457	Inactive - Strip
20	East Liverpool - Fulton County, Illinois	140.00	103.22	344,842	Inactive - Strip
20	Gayle Field - Perry County, Illinois	358.96	222.43	1,714,710	Inactive - Strip
21	Hayden Field - Routt County, Colorado	5,937.47	712.60	12,522,000	Inactive - Strip
21	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	-	-	-	In Process of Being Sold
21	LeFlore County, Oklahoma	1,020.00	522.90	2,301,872	Inactive - Strip
	TOTAL - INACTIVE - STRIP	18,536.29	7,517.92	40,789,847	
	GRAND TOTAL - STRIP RESERVES	58,024.59	15,519.80	91,281,939	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF DECEMBER 31, 1967

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
21 & 22	Mine No. 11 - Fidelity - Perry County, Illinois	1,336.78	960.74	5,342,280	Inactive - Deep
22	Buffalo Creek #2 - Hopkins & Christian Counties, Kentucky	-	-	-	In Process of being Sold
23, 24 & 25	Mound Prairie Field - Perry & Washington Counties, Illinois	7,439.74	7,356.74	44,042,333	Inactive - Deep
	TOTAL - INACTIVE - DEEP	8,776.52	8,297.48	49,384,613	
26	Mound Prairie Field - Perry & Washington Counties, Illinois	109.00	109.00	445,801	Inactive - Isolated - Deep
26	Howie Property - Vermilion County, Illinois	313.80	310.00	1,550,000	Inactive - Isolated - Deep
26	Swallow Property - Vermilion County, Illinois	40.00	40.00	245,360	Inactive - Isolated - Deep
26	Buffalo Creek #19 - Hopkins County, Kentucky	146.00	2.30	-	Inactive - Isolated
	TOTAL - INACTIVE - ISOLATED	608.80	461.30	2,241,161	
	GRAND TOTAL - DEEP RESERVES	9,385.32	8,758.78	51,625,774	
	TOTAL - STRIP RESERVES	58,024.59	15,519.80	91,281,939	
	TOTAL - DEEP RESERVES	9,385.32	8,758.78	51,625,774	
	GRAND TOTAL - RESERVES	67,409.91	24,278.58	141,907,713	

523

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF DECEMBER 31, 1946

PAGE NO.	STRIP RESERVES	ESTIMATED RESERVE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
1, 2 & 3	Mine No. 9 - Cuba - Fulton County, Illinois	8,231.21	729.00	4,491,713	Active - Mining - Strip
4, 5, 6 & 7	Mine No. 11 - Fidelity - Perry County, Illinois	10,891.50	2,481.15	21,090,423	Active - Mining - Strip
8 & 9	Clinch Field - Fidelity - Perry County, Illinois	1,360.46	84.88	781,220	Active - Mining - Strip
10 & 11	Mine No. 17 - North Buckheart - Fulton County, Illinois	5,739.52	1,321.10	8,551,617	Active - Mining - Strip
11, 12, 13 & 14	Mine No. 17 - South Buckheart - Fulton County, Illinois	8,113.30	1,053.83	12,105,501	Active - Mining - Strip
15	Mine No. 25 - Mary Moore - Vermilion County, Illinois	65.21	-	421,000	Inactive - Completed - 1945
15 & 16	Mine No. 27 - Banner - Fulton & Peoria Cos., Illinois	4,992.78	2,451.97	7,874,159	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	39,393.58	8,921.33	54,995,613	
16, 17 & 18	North Canton Field - Fulton County, Illinois	5,737.36	2,228.67	11,355,966	Inactive - Strip
18	Coyle Field - Perry County, Illinois	358.96	222.43	1,714,710	Inactive - Strip
19	Industry Field - McDonough & Schuyler Cos., Illinois	5,342.50	3,668.10	12,550,457	Inactive - Strip
20	Boyden Field - Routt County, Colorado	5,937.47	712.60	12,522,000	Inactive - Strip
20	Buffalo Creek #2 - Hopkins & Christian Cos., Ky.	867.72	218.47	1,166,570	Inactive - Strip
21	Leflore County, Oklahoma	1,089.00	582.90	2,301,872	Inactive - Strip
21	East Liverpool - Fulton County, Illinois	140.00	103.22	344,842	Inactive - Strip
	TOTAL - INACTIVE - STRIP	19,468.01	7,736.39	41,956,417	
	GRAND TOTAL - STRIP RESERVES	58,777.59	16,657.72	96,952,030	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF DECEMBER 31, 1946

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL			REMARKS
		TOTAL ACRES	COAL ACRES	TONS	
21 & 22	Mine No. 11 - Fidelity - Perry County, Illinois	1,336.78	960.74	5,362,280	Inactive - Deep
22 & 23	Buffalo Creek #2 - Daviess & Christian Cos., Kentucky	1,687.00	871.63	3,223,378	Inactive - Deep
23, 24 & 25	Round Prairie Field - Perry & Washington Cos., Illinois	7,321.74	7,838.74	43,337,153	Inactive - Deep
	TOTAL - INACTIVE - DEEP	10,345.52	9,051.11	51,922,811	
26	Round Prairie Field - Perry & Washington Cos., Illinois	109.00	109.00	545,981	Inactive - Isolated - Deep
26	Mantle Property - Vermilion County, Illinois	313.80	310.00	1,550,000	Inactive - Isolated - Deep
26	Shelley Property - Vermilion County, Illinois	40.00	40.00	245,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED - DEEP	462.80	459.00	2,341,341	
	GRAND TOTAL - DEEP RESERVES	10,808.32	9,510.11	54,264,152	
	TOTAL - STRIP RESERVES	58,797.59	16,657.72	96,952,030	
	TOTAL - DEEP RESERVES	10,808.32	9,510.11	54,264,152	
	GRAND TOTAL - RESERVES	69,605.91	26,167.83	151,196,182	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF DECEMBER 31, 1965

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
19 & 20	Mine No. 11 - Fidelity - Perry County, Illinois	1,356.51	697.50	5,114,100	Inactive - Deep
20 & 21	Buffalo Creek No. 7 - Hopkins & Christian Counties, Kentucky	1,487.00	903.22	3,388,857	Inactive - Deep
21, 22 & 23	Round Prairie Field - Perry & Washington Counties, Illinois	7,321.74	7,236.74	43,337,153	Inactive - Deep
	TOTAL - INACTIVE - DEEP	10,165.25	9,040.46	51,760,190	
24	Round Prairie Field - Perry & Washington Counties, Illinois	109.00	109.00	515,981	Inactive - Isolated - Deep
24	Francis Property - Vermilion County, Illinois	313.80	310.00	1,550,000	Inactive - Isolated - Deep
24	Shallow Property - Vermilion County, Illinois	40.00	40.00	215,960	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED - DEEP	462.80	459.00	2,341,341	
	GRAND TOTAL - DEEP RESERVES	10,628.05	9,499.46	54,121,531	
	TOTAL - STRIP RESERVES	58,932.48	17,325.61	100,830,922	
	TOTAL - DEEP RESERVES	10,628.05	9,499.46	54,121,531	
	GRAND TOTAL - RESERVES	69,760.70	26,825.07	154,952,453	

THE UNITED ELECTRIC COAL COMPANIES
LAND & RESERVE COAL
AS OF DECEMBER 31, 1965

PAGE NO.	STRIP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
1, 2 & 3	Mine No. 9 - Cuba - Fulton County, Illinois	8,151.21	866.72	5,316,061	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	10,693.75	2,608.93	22,372,333	Active - Mining - Strip
6, 7 & 8	Climax Field - Fidelity - Perry County, Illinois	1,360.86	84.88	781,800	Active - Mining - Strip
8 & 9	Mine No. 17 - North Duquoin - Fulton County, Illinois	5,739.52	1,567.55	10,247,798	Active - Mining - Strip
9, 10, 11 & 12	Mine No. 17 - South Duquoin - Fulton County, Illinois	7,598.01	1,696.55	11,163,665	Active - Mining - Strip
12 & 13	Mine No. 25 - Mary Moore - Vermilion County, Illinois	723.82	-	-	Inactive - Completed - 1965
14	Mine No. 27 - Ramsey - Fulton & Peoria Counties, Illinois	4,852.78	2,723.76	8,760,685	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	39,819.35	9,546.29	58,641,676	
15 & 16	North Canton Field - Fulton County, Illinois	5,737.36	2,228.67	11,355,966	Active - Prospecting - Strip
17	Coyle Field - Perry County, Illinois	457.22	228.43	1,714,710	Active - Prospecting - Strip
17 & 18	Industry Field - McDonough & Schuyler Counties, Illinois	5,342.50	3,660.10	12,550,457	Active - Prospecting - Strip
18 & 19	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	1,058.72	842.40	1,399,399	Active - Prospecting - Strip
20	Hayden Field - Routt County, Colorado	5,937.47	712.60	12,521,000	Active - Prospecting - Strip
19	Leflore County, Oklahoma	1,080.00	582.90	8,301,872	Inactive - Strip
19	East Liverpool - Fulton County, Illinois	160.00	103.22	561,816	Inactive - Strip
	TOTAL - INACTIVE - STRIP	19,693.27	7,750.32	48,189,316	
	GRAND TOTAL - STRIP RESERVES	58,918.62	17,325.61	100,830,992	

THE UNITED ELECTRIC COAL COMPANIES

LANDS & RESERVE COAL

AS OF DECEMBER 31, 1924

PAGE NO.	STRIP RESERVES	ESTIMATED RESERVE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Ohio - Fulton County, Illinois	6,238.53	303.22	2,034,370	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	10,676.35	2,926.29	25,065,515	Active - Mining - Strip
6, 7 & 8	Glimm Field - Fidelity - Perry County, Illinois	1,360.86	84.88	761,200	Active - Mining - Strip
9	Mine No. 17 - North Buckheart - Fulton County, Illinois	5,545.32	1,861.04	11,981,089	Active - Mining - Strip
10, 11 & 12	Mine No. 17 - South Buckheart - Fulton County, Illinois	7,278.01	1,431.55	9,388,285	Active - Mining - Strip
13 & 14	Mine No. 25 - Mary Moore - Vermilion County, Illinois	722.81	2.27	19,215	Active - Mining - Strip
14 & 15	Mine No. 27 - Banner - Fulton & Peoria Counties, Illinois	3,162.73	2,161.49	8,006,781	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	36,284.61	9,052.14	57,279,455	
15, 16 & 17	North Canton Field - Fulton County, Illinois	4,842.60	3,361.82	17,518,954	Inactive - Strip
17	Coyle Field - Perry County, Illinois	457.22	222.43	1,714,710	Inactive - Strip
18	Industry Field - McDonough & Schuyler Counties, Illinois	5,342.50	3,668.10	12,550,457	Inactive - Strip
19	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	1,058.72	868.10	1,399,399	Inactive - Strip
19	Leflore County, Oklahoma	1,020.00	582.90	2,301,872	Inactive - Strip
20	East Liverpool - Fulton County, Illinois	110.00	103.88	344,848	Inactive - Strip
	TOTAL - INACTIVE - STRIP	12,861.04	8,900.87	35,830,134	
	GRAND TOTAL - STRIP RESERVES	49,145.65	17,953.01	93,109,589	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF DECEMBER 31, 1946

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
20 & 21	Mine No. 11 - Fidelity - Perry County, Illinois	1,156.54	898.50	5,114,180	Inactive - Deep
21 & 22	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	2,055.50	1,063.22	3,793,497	Inactive - Deep
22, 23 & 24	Round Prairie Field - Perry & Washington Counties, Illinois	6,455.74	6,172.74	37,207,182	Inactive - Deep
	TOTAL - INACTIVE - DEEP	9,667.78	8,134.46	46,114,859	
24	Round Prairie Field - Perry & Washington Counties, Illinois	109.00	109.00	545,961	Inactive - Isolated - Deep
25	Nowsie Property - Vermilion County, Illinois	313.00	310.00	1,550,000	Inactive - Isolated - Deep
25	Swallow Property - Vermilion County, Illinois	40.00	40.00	245,400	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED - DEEP	462.00	459.00	2,341,361	
	GRAND TOTAL - DEEP RESERVES	10,130.58	8,593.46	48,456,220	
	TOTAL - STRIP RESERVES	49,145.05	17,253.01	93,109,469	
	TOTAL - DEEP RESERVES	10,130.58	8,593.46	48,456,220	
	GRAND TOTAL - RESERVES	59,275.63	25,846.47	141,565,689	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF JULY 31, 1964

PAGE NO.	STRIP RESERVES	ESTIMATED RESERVE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Cuba - Fulton County, Illinois	6,134.53	367.87	3,146,235	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	10,675.35	3,009.81	25,737,368	Active - Mining - Strip
6, 7 & 8	Clinch Field - Fidelity - Perry County, Illinois	1,360.86	84.88	781,200	Active - Mining - Strip
9	Mine No. 17 - North Buckheart - Fulton County, Illinois	5,158.92	1,971.64	12,803,936	Active - Mining - Strip
10, 11 & 12	Mine No. 17 - South Buckheart - Fulton County, Illinois	7,278.01	1,431.55	9,388,285	Active - Mining - Strip
13 & 14	Mine No. 25 - Mary Moore - Vermilion County, Illinois	722.81	11.89	95,180	Active - Mining - Strip
14 & 15	Mine No. 27 - Banner - Fulton & Peoria Counties, Illinois	1,389.99	2,186.12	8,081,841	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	36,123.47	9,362.56	59,134,039	
15, 16 & 17	North Canton Field - Fulton County, Illinois	4,842.60	3,361.82	17,518,954	Active - Prospecting - Strip
17	Gayle Field - Perry County, Illinois	457.22	222.43	1,714,710	Active - Prospecting - Strip
18	Industry Field - McDonough & Schuyler Counties, Illinois	5,342.50	3,668.10	18,550,457	Active - Prospecting - Strip
19	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	1,858.72	868.40	4,399,399	Active - Prospecting - Strip
19	LeFlore County, Oklahoma	1,280.00	582.90	2,301,872	Inactive - Strip
20	East Liverpool - Fulton County, Illinois	110.00	101.22	344,848	Inactive - Strip
	TOTAL - INACTIVE - STRIP	13,861.04	8,200.87	35,830,234	
	GRAND TOTAL - STRIP RESERVES	49,984.51	17,563.43	95,164,273	

THE UNITED ELECTRIC COAL COMPANIES
LAND & RESERVE COAL
AS OF JULY 31, 1946

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
10 & 11	Mine No. 11 - Fidelity - Perry County, Illinois	1,359.54	898.50	5,114,180	Inactive - Deep
11 & 12	Buffalo Creek No. 8 - Hopkins & Christian Counties, Kentucky	2,953.50	1,063.22	3,793,497	Inactive - Deep
13, 23 & 24	Mound Prairie Field - Perry & Washington Counties, Illinois	4,315.74	4,132.74	26,975,862	Inactive - Deep
	TOTAL - INACTIVE - DEEP	8,627.78	8,094.46	45,883,539	
24	Mound Prairie Field - Perry & Washington Counties, Illinois	109.00	109.00	545,981	Inactive - Isolated - Deep
25	Hamis Property - Vermilion County, Illinois	313.80	310.00	1,550,000	Inactive - Isolated - Deep
25	Hollow Property - Vermilion County, Illinois	40.00	40.00	245,260	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED - DEEP	462.80	459.00	2,341,241	
	GRAND TOTAL - DEEP RESERVES	10,490.58	8,553.46	48,223,880	
	TOTAL - STRIP RESERVES	16,984.91	17,963.43	97,144,273	
	TOTAL - DEEP RESERVES	10,490.58	8,553.46	48,223,880	
	GRAND TOTAL - RESERVES	27,475.49	26,516.89	145,368,153	

THE [illegible] ELECTRIC COAL COMPANIES
[illegible] & RESERVE COAL
AS OF JULY 31, 1963

PAGE NO.	STRIP RESERVES	ESTIMATED RECOVERY COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Ohio - Fulton County, Illinois	5,806.60	813.86	1,140,206	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	10,488.55	3,078.65	86,895,346	Active - Mining - Strip
6 & 7	Elkhorn Field - Fidelity - Perry County, Illinois	1,360.86	84.98	781,800	Active - Mining - Strip
8	Mine No. 17 - North Duquoin - Fulton County, Illinois	5,393.97	2,111.50	13,753,360	Active - Mining - Strip
9, 10 & 11	Mine No. 17 - South Duquoin - Fulton County, Illinois	6,490.75	1,868.95	8,275,085	Active - Mining - Strip
12 & 13	Mine No. 25 - Mary Moore - Vermilion County, Illinois	544.99	41.98	365,521	Active - Mining - Strip
13 & 14	Mine No. 27 - Banner - Fulton & Peoria Counties, Illinois	3,858.14	2,328.86	7,695,070	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	33,957.81	9,180.82	58,583,796	
14 & 15	North Canton Field - Fulton County, Illinois	4,689.87	3,196.82	16,522,154	Active - Prospecting - Strip
15 & 16	Gayle Field - Perry County, Illinois	457.82	229.43	1,714,710	Active - Prospecting - Strip
16 & 17	Industry Field - McDonough County, Illinois	4,970.50	3,476.10	11,950,457	Active - Prospecting - Strip
17 & 18	Buffalo Creek #8 - Hopkins & Christian Counties, Kentucky	1,058.78	868.40	1,379,299	Active - Prospecting - Strip
	TOTAL - ACTIVE - PROSPECTING	11,115.71	7,157.75	31,586,920	
18	LeFlore County, Oklahoma	1,080.00	582.90	2,301,872	Inactive - Strip
18	South Duquoin - Isolated - Fulton County, Illinois	180.00	103.22	364,842	Inactive - Strip
	TOTAL - INACTIVE - STRIP	1,260.00	686.12	2,666,714	
	GRAND TOTAL - STRIP RESERVES	46,333.48	16,954.69	92,837,430	

532

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF JULY 31, 1963

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
18 & 19	Mine No. 11 - Fidelity - Perry County, Illinois	1,356.5±	898.50	5,114,180	Inactive - Deep
19 & 20	Buffalo Creek #3 - Hopkins & Christian Counties, Kentucky	2,055.50	1,063.22	3,793,497	Inactive - Deep
21 & 22	Round Prairie Field - Perry County, Illinois	3,934.5±	3,851.5±	23,681,781	Inactive - Deep
	TOTAL - INACTIVE - DEEP	7,346.48	5,812.96	32,589,458	
22	Round Prairie Field - Perry County, Illinois	109.00	109.00	545,981	Inactive - Isolated - Deep
23	Nunnie Property	313.80	330.00	1,550,000	Inactive - Isolated - Deep
23	Swallow Property	40.00	40.00	245,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED	462.80	459.00	2,341,341	
	GRAND TOTAL - DEEP RESERVES	7,809.08	6,271.96	34,930,799	
	TOTAL - STRIP RESERVES	46,233.22	46,964.69	92,817,430	
	TOTAL - DEEP RESERVES	7,809.08	6,271.96	34,930,799	
	GRAND TOTAL - RESERVES	54,042.30	53,236.65	127,748,229	

THE NORTH ILLINOIS COAL COMPANY
LANDS & RESERVE COAL
AS OF JULY 31, 1952

PAGE NO.	STRIP RESERVES	ESTIMATED MINABLE COAL TOTAL COAL ACRES	ESTIMATED MINABLE COAL COAL ACRES	ESTIMATED MINABLE COAL TONS	REMARKS
1 & 2	Mine No. 9 - Cuba - Fulton County, Illinois	5,806.40	334.60	8,858,305	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	9,751.19	2,143.49	34,968,675	Active - Mining - Strip
6 & 7	Elmah Field - Fidelity - Perry County, Illinois	1,360.86	94.88	781,200	Active - Mining - Strip
8, 9, 10 & 11	Mine No. 17 - Smithboro - Fulton County, Illinois	11,938.34	1,468.74	22,380,896	Active - Mining - Strip
12 & 13	Mine No. 25 - Hoyt Moore - Vermilion County, Illinois	722.66	73.37	688,135	Active - Mining - Strip
13 & 14	Mine No. 27 - Hanway - Fulton & Peoria Counties, Illinois	3,566.27	2,409.40	7,578,082	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	33,145.43	6,867.88	83,986,431	
15 & 16	North Canton Field - Fulton County, Illinois	3,370.95	1,836.35	11,680,539	Active - Prospecting - Strip
16	Gayle Field - Perry County, Illinois	457.28	288.43	1,714,710	Active - Prospecting - Strip
17	Industry Field - McDonough County, Illinois	4,617.80	2,391.10	13,699,017	Active - Prospecting - Strip
18	Buffalo Creek #2 - Hopkins & Christian Counties, Kentucky	1,009.72	860.40	1,377,727	Active - Prospecting - Strip
	TOTAL - ACTIVE - PROSPECTING	9,734.35	5,318.28	28,503,665	
18	LeFlore County, Oklahoma	1,080.00	581.90	4,301,873	Inactive - Strip
18	South Smithboro (Isolated) - Fulton County, Illinois	160.00	103.22	764,838	Inactive - Isolated - Strip
	TOTAL - INACTIVE - STRIP	1,240.00	686.12	9,066,711	
	GRAND TOTAL - STRIP RESERVES	44,039.78	12,066.28	88,076,810	

THE UNITED ELECTRIC COAL COMPANIES
LAND & RESERVE COAL
AS OF JULY 31, 1966

PAGE NO.	DEEP RESERVE	ESTIMATED RESERVE COAL TOTAL ACRES	ESTIMATED RESERVE COAL COAL ACRES	TONS	REMARKS
19	Mine No. 12 - Fidelity - Perry County, Illinois	1,356.54	898.50	5,114,180	Inactive - Deep
20 & 21	Buffalo Creek #1 - Boyles & Christian Counties, Kentucky	2,055.50	1,143.22	4,063,897	Inactive - Deep
21 & 22	Round Prairie Field - Perry County, Illinois	4,043.14	3,950.14	24,227,762	Inactive - Deep
	TOTAL - INACTIVE - DEEP	7,455.18	6,001.96	33,405,839	
23	Nunis Property - Vermilion County, Illinois	313.80	310.00	1,550,000	Inactive - Isolated - Deep
23	Hollow Property - Vermilion County, Illinois ADD ABOVE TRAILIC DEV ISOLATED	40.00	40.00	225,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED	353.80	350.00	1,775,360	
	GRAND TOTAL - DEEP RESERVES	7,809.08	6,351.96	35,221,199	
	TOTAL - STRIP RESERVES	44,039.78	16,066.28	88,078,810	
	TOTAL - DEEP RESERVES	7,809.08	6,351.96	35,221,199	
	GRAND TOTAL - RESERVES	51,848.86	22,418.24	123,300,009	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & STRIP COAL
AS OF JULY 31, 1961

MAP NO.	STRIP RESERVES	ESTIMATED RECOVERABLE COAL: TOTAL ACRES	GOOD ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Duke - Fulton County, Illinois	5,806.40	457.73	3,021,764	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	9,751.20	3,119.08	26,594,817	Active - Mining - Strip
6 & 7	Clinch Field - Fidelity - Perry County, Illinois	1,350.56	84.88	781,900	Active - Mining - Strip
8, 9 & 10	Mine No. 17 - Buckhart - Fulton County, Illinois	11,279.24	3,106.43	20,355,130	Active - Mining - Strip
11 & 12	Mine No. 25 - Mary Moore - Vermilion County, Illinois	506.16	16.17	171,500	Active - Mining - Strip
12	Mine No. 27 - Bruner - Fulton & Peoria Counties, Illinois	3,521.32	2,521.83	8,420,076	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	32,181.73	9,375.52	59,177,507	
13	North Canton Field - Fulton County, Illinois	2,712.74	1,768.15	9,877,130	Active - Prospecting - Strip
14	Gayle Field - Perry County, Illinois	457.12	227.43	1,714,710	Active - Prospecting - Strip
15	Industry Field - McDonough County, Illinois	4,849.50	3,391.10	11,699,817	Active - Prospecting - Strip
16	Buffalo Creek #2 - Trigg & Christian Counties, Kentucky	1,061.72	269.40	1,399,399	Active - Prospecting - Strip
	TOTAL - ACTIVE - PROSPECTING	9,081.08	5,656.08	24,090,256	
16	LeFlore County, Oklahoma	1,481.40	528.90	2,301,872	Inactive - Strip
16	South Buckhart Field - Fulton County, Illinois	1,481.40	107.22	364,842	Inactive - Isolated - Strip
	TOTAL - INACTIVE - STRIP	1,481.40	636.12	2,666,714	
	GRAND TOTAL - STRIP RESERVES	42,420.00	15,705.72	85,934,477	

536

THE UNITED ELECTRIC COAL COMPANIES
KINGS & EDDYSTON COAL
AS OF JULY 31, 1951

Tract No.	DEEP RESERVES	ESTIMATED RECOVERABLE COAL: TOTAL ACRES	COAL ACRES	TONS	REMARKS
17 & 18	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	2,055.50	1,143.22	4,083,897	Inactive - Deep
19	Mine No. 11 - Fidelity - Perry County, Illinois	1,355.54	898.50	5,114,180	Inactive - Deep
20 & 21	Duquoin Prairie Field - Perry County, Illinois	4,044.84	3,550.24	24,227,762	Inactive - Deep
	TOTAL - INACTIVE - DEEP	7,455.88	6,001.96	33,425,839	
22	Salt Fork Field - Vermilion County, Illinois	136.00	135.00	691,152	Inactive - Isolated - Deep
22	Thomie Property - Vermilion County, Illinois	313.00	310.00	1,550,600	Inactive - Isolated - Deep
22	Swallow Property - Vermilion County, Illinois	40.00	40.00	865,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - ISOLATED	489.00	486.00	3,106,512	
	GRAND TOTAL - DEEP RESERVES	7,945.88	6,487.96	35,912,351	
	TOTAL - STRIP RESERVES	42,420.76	15,705.72	85,914,477	
	TOTAL - DEEP RESERVES	7,945.88	6,487.96	35,912,351	
	GRAND TOTAL - RESERVES	50,366.64	22,193.68	121,826,828	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF JULY 31, 1960

FIGT NO.	STRIP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Cuba - Fulton County, Illinois	5,866.60	587.19	3,909,179	Active - Mining - Strip
3, 4, 5 & 6	Mine No. 11 - Fidelity - Perry County, Illinois	9,750.20	3,323.69	28,353,657	Active - Mining - Strip
6 & 7	Clinch Field - Fidelity - Perry County, Illinois	1,360.26	84.28	781,900	Active - Mining - Strip
8, 9 & 10	Mine No. 17 - Buckheart - Fulton County, Illinois	11,045.12	3,283.54	21,299,311	Active - Mining - Strip
11	Mine No. 25 - Mary Moore - Vermilion County, Illinois	398.79	4.31	30,300	Active - Mining - Strip
12	Mine No. 27 - Sumner - Fulton & Peoria Counties, Illinois	3,291.45	2,610.80	8,867,827	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	31,652.42	9,893.81	63,248,874	
13	North Canton Field - Fulton County, Illinois	2,552.74	1,672.15	8,753,030	Active - Prospecting - Strip
14	Coyle Field - Perry County, Illinois	457.22	222.43	1,714,710	Active - Prospecting - Strip
15	Industry Field - McDonough County, Illinois	4,727.50	3,339.10	13,589,717	Active - Prospecting - Strip
16	Buffalo Creek #2 - Hopkins & Christian Counties, Kentucky	1,058.72	262.80	1,399,399	Active - Prospecting - Strip
	TOTAL - ACTIVE - PROSPECTING	8,796.18	5,496.08	23,396,856	
15	Leflore County, Oklahoma	1,020.00	582.90	2,301,672	Inactive - Strip
16	South Buckheart Field - Fulton County, Illinois	140.00	103.22	344,842	Inactive - Isolated - Strip
	TOTAL - INACTIVE - STRIP	1,160.00	686.12	2,646,714	
	GRAND TOTAL - STRIP RESERVES	41,608.60	16,076.01	89,292,444	

THE UNITED ELECTRIC COAL COMPANIES
COAL & RESERVE COAL
AS OF JULY 31, 1960

PAGE NO.	DEEP RESERVES	ESTIMATED RESERVE COAL — TOTAL ACRES	COAL ACRES	TONS	REMARKS
17 & 18	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	2,655.52	1,143.22	4,083,897	Inactive - Deep
19	Mine No. 11 - Fidelity - Perry County, Illinois	1,156.54	898.50	5,114,180	Inactive - Deep
20 & 21	Round Prairie Field - Perry County, Illinois	3,793.45	3,620.24	22,253,042	Inactive - Deep
	TOTAL - INACTIVE - DEEP	7,115.51	5,661.96	31,451,119	
22	Salt Fork Field - Vermilion County, Illinois	135.00	136.00	691,152	Inactive - Isolated - Deep
22	Hamrie Property - Vermilion County, Illinois	313.80	310.00	1,550,000	Inactive - Isolated - Deep
22	Smallen Property - Vermilion County, Illinois	40.00	40.00	245,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - DEEP	489.80	486.00	2,486,512	
	GRAND TOTAL - DEEP RESERVES	7,605.31	6,147.96	33,937,631	
	TOTAL - SURFACE RESERVES	41,608.40	16,076.01	89,292,444	
	TOTAL - DEEP RESERVES	7,605.31	6,147.96	33,937,631	
	GRAND TOTAL - RESERVES	49,213.48	22,223.97	123,230,075	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF JULY 31, 1972

PAGE NO.	STRIP RESERVES	ESTIMATED RECOVERABLE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Coke - Fulton County, Illinois	5,806.60	730.38	4,894,127	Active - Mining - Strip
3, 4 & 5	Mine No. 11 - Fidelity - Perry County, Illinois	9,384.00	3,306.15	28,858,953	Active - Mining - Strip
6 & 7	Glimah Field - Fidelity - Perry County, Illinois	1,360.86	166.11	971,068	Active - Mining - Strip
8, 9 & 10	Mine No. 17 - Buckheart - Fulton County, Illinois	11,143.18	3,446.72	22,311,761	Active - Mining - Strip
10	Mine No. 19 - Buffalo Creek - Hopkins County, Kentucky	ALL PROPERTY TRANSFERRED TO MINE NO. 21			
11	Mine No. 25 - Mary Moore - Vermilion County, Illinois	396.77	39.83	383,530	Active - Mining - Strip
	TOTAL - ACTIVE - MINING	28,091.03	7,628.59	55,759,439	
12	North Canton Field - Fulton County, Illinois	8,256.04	1,574.15	8,231,630	Active - Prospecting - Strip
13	Banner Field - Peoria & Fulton Counties, Illinois	1,790.35	1,558.21	5,698,387	Active - Prospecting - Strip
13	Kingston Mines Terminal - Peoria County, Illinois	(76.50)	-	-	Dock Site
14	Gayle Field - Perry County, Illinois	457.22	222.43	1,711,720	Active - Prospecting - Strip
15	Industry Field - McDonough County, Illinois	3,660.50	2,529.10	8,976,117	Active - Prospecting - Strip
16	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	1,098.72	364.10	1,389,399	Active - Prospecting - Strip
16	TOTAL - ACTIVE - PROSPECTING	8,431.83	6,156.29	26,080,213	
16	South Buckheart Field - Fulton County, Illinois	160.00	103.22	364,842	Inactive - Isolated - Strip
16	LaFlore County, Oklahoma	1,000.00	562.90	2,201,872	Inactive - Strip
	TOTAL - INACTIVE - STRIP	1,160.00	666.12	2,646,714	
	GRAND TOTAL - STRIP RESERVES	37,682.86	14,471.00	85,486,366	

THE UNITED ELECTRIC COAL COMPANIES
[illegible]
AS OF JULY 31, 1957

Page No.	DEEP RESERVES	ESTIMATED RESERVE COAL TOTAL ACRES	COAL ACRES	TONS	REMARKS
17	Mine No. 21 - Hopkins County, Kentucky	3,171.96	1,961.73	6,189,403	Inactive - Deep
18	Mine No. 11 - Fidelity - Perry County, Illinois	1,256.24	898.50	5,114,180	Inactive - Deep
19 & 20	Buffalo Creek No. 2 - Hopkins & Christian Counties, Kentucky	2,055.50	1,143.22	4,603,897	Inactive - Deep
21 & 22	Pound Prairie Field - Perry County, Illinois	3,167.24	3,400.24	20,962,442	Inactive - Deep
	TOTAL - INACTIVE - DEEP	10,000.24	7,403.69	36,869,922	
23	Salt Fork Field - Vermilion County, Illinois	136.28	136.00	691,152	Inactive - Isolated - Deep
23	Harvie Property - Vermilion County, Illinois	310.00	310.00	1,550,000	Inactive - Isolated - Deep
23	Sullivan Property - Vermilion County, Illinois	40.00	40.00	245,360	Inactive - Isolated - Deep
	TOTAL - INACTIVE - DEEP	486.80	486.00	2,486,512	
	GRAND TOTAL - DEEP RESERVES	10,486.24	7,889.69	39,136,434	
	TOTAL - STRIP RESERVES	37,881.56	14,471.00	85,486,366	
	TOTAL - DEEP RESERVES	10,486.24	7,889.69	39,136,434	
	GRAND TOTAL - RESERVES	48,368.80	22,360.69	124,568,800	

THE UNITED ELECTRIC COAL COMPANIES
LANDS & RESERVE COAL
AS OF JULY 31, 1961

MAP NO.		ESTIMATED RESERVE COAL			
		TOTAL ACRES	COAL ACRES	TONS	REMARKS
1 & 2	Mine No. 9 - Cuba - Fulton County, Illinois	5,806.0	953.73	5,729,668	Active - Mining - Strip
3, 4 & 5	Mine No. 11 - Fidelity - Perry County, Illinois	9,247.0	3,218.03	27,480,079	Active - Mining - Strip
6 & 7	Elkhorn Field - Fidelity - Perry County, Illinois	1,340.16	230.52	1,921,936	Active - Mining - Strip
8, 9 & 10	Mine No. 17 - Smithcourt - Fulton County, Illinois	10,678.53	3,171.10	20,676,151	Active - Mining - Strip
11	Mine No. 19 - Buffalo Creek - Hopkins County, Kentucky	1,172.05	59.33	288,243	Active - Mining - Strip
12	Mine No. 25 - Dove Creek - Vermilion County, Illinois	223.77	60.19	315,995	Active - Mining - Strip
	TOTAL - ACTIVE - MINES	28,610.46	7,573.10	58,570,141	
13	North Canton Field - Fulton County, Illinois	2,255.04	1,574.15	8,231,630	Active - Prospecting - Strip
14	Glenford-Conner Field - Peoria & Fulton Cos., Ill.	1,207.66	1,118.84	4,331,000	Active - Prospecting - Strip
15	Illinois River Terminal - Peoria County, Illinois	(16.00)	-	-	Dock Site
16	Coyle Field - Perry County, Illinois	454.02	222.43	1,711,711	Active - Prospecting - Strip
17	Industry Field - McDonough County, Illinois	3,050.70	2,529.18	8,774,117	Active - Prospecting - Strip
18	Buffalo Creek #2 - Hopkins & Christian Cos., Kentucky	1,338.71	166.26	2,343,451	Active - Prospecting - Strip
	TOTAL - ACTIVE - PROSPECTING	8,330.33	5,910.86	25,391,909	

THE SMITH ELKHORN COAL COMPANY

LANDS & RESERVE COAL

AS OF JULY 1, 1950

MAP NO.		ENTERED INACTIVE COAL		
		TOTAL ACRES	TOTAL ACRES	TONS
15	Leflore County, Oklahoma	1,020.00	582.90	2,301,672
16	Mine No. 21 - Hopkins County, Kentucky	1,970.11	1,931.10	6,363,079
17	Buffalo Creek No. 2 - Hopkins & Christian Cos. Ky.	2,327.57	1,231.91	4,372,209
18	Deep Coal Reserves Map No. 11 - Perry County, Ill.	1,356.94	970.50	5,114,100
	TOTAL - INACTIVE - DEEP	5,674.62	4,061.51	15,873,153
18	South Duchman Field - Fulton County, Illinois	140.00	103.22	344,842
19	Hancis Property - Vermilion County, Illinois	313.00	310.00	1,559,000
19	Smiley Property - Vermilion County, Illinois	40.00	40.00	216,250
	TOTAL - INACTIVE & ISOLATED - DEEP	353.00	350.00	1,775,250
	TOTAL - ACTIVE RESERVES	37,050.81	13,458.48	82,343,031
	TOTAL - INACTIVE RESERVES	7,189.62	5,097.63	20,115,028
	GRAND TOTAL - RESERVES	44,240.43	18,556.11	102,458,403

EXPLANATION

Inactive - Strip

Inactive - Deep

Inactive - Deep

Inactive - Deep

Inactive - Isolated - Strip

Inactive - Isolated - Deep

Inactive - Isolated - Deep

543

(C) CHANGES IN RESERVE TONNAGE 1958 - 1969

MEMO

CHANGES IN STRIP RESERVE TONNAGE DURING 1969

MINE NO. 9

Mined Out	(805,608)
Estimated Adjustment	(91,200)
Yield Loss	(55,538)
New Lands	7,727
Net Change	(944,619)

MINE NO. 11

Mined Out	(1,146,041)
Estimate Change	(460,046)
Yield Gain, Present Pit	111,734
New Lands	2,059,337
Net Change	564,984

CLINCH PIT

Mined Out	(687,909)
Yield Gain	29,585
Estimated Adjustment	17,741
Net Change	(640,583)

MINE NO. 17 (NORTH)

Mined Out	(957,832)
Estimated Adjustment	-
Yield Gain	29,023
Net Change	(928,809)

MINE NO. 17 (SOUTH)

Mined Out	(1,304,530)
Estimated Adjustment	508,356
Yield Gain	142,638
New Leases	-
Net Change	(653,536)

MINE NO. 27

Mined Out	(685,932)
Estimated Adjustment	(242,976)
Yield Loss	(46,092)
Net Change	(975,000)

MEMO

CHANGES IN STRIP RESERVE TONNAGE DURING 1968

MINE NO. 9

Mined Out	(738,055)
Estimated Adjustment	(7,919)
Yield Loss	(28,084)
New Lands	287,505
Estimated Change	(744,849)
Yield Change	(337,373)
Net Change	(1,568,775)

MINE NO. 11

Mined Out	(1,709,357)
Estimated Adjustment	(91,624)
Yield Gain	57,521
New Lands	348,816
Net Change	(1,394,644)

CLINCH PIT

Mined Out	(134,736)
Yield Loss	(5,881)
Net Change	(140,617)

MINE NO. 17 (NORTH)

Mined Out	(872,715)
Estimated Adjustment	(48,891)
Yield Gain	43,179
Net Change	(878,427)

MINE NO. 17 (SOUTH)

Mined Out	(1,129,631)
Estimated Adjustment	372,330
Yield Gain	74,487
New Leases	236,387
Net Change	(446,427)

MINE NO. 27

Mined Out	.....	(675,217)
Estimated Adjustment	.....	(56,411)
Yield Loss	.....	(76,673)
Net Change	.....	(808,301)

MEMO: Changes in Strip Reserve Tonnage During 1967

MINE NO. 9

Mined Out	(974,347)
Estimated Adjustment	21,179
Yield Loss	(42,294)
New Lands	223,403
Net Change	(772,059)

MINE NO. 11

Mined Out	(2,031,157)
Estimated Adjustment	(29,010)
Yield Gain	104,590
New Lands	60,204
Net Change	(1,895,373)

MINE NO. 17 (North)

Mined Out	(987,301)
Estimated Adjustment	(20,895)
Yield Gain	15,024
Lease Expired (Floyd Shelby et al)	(53,635)
Net Change	(1,046,807)

MINE NO. 17 (South)

Mined Out	(916,633)
Estimated Adjustment	71,604
Yield Gain	64,914
Net Change	(780,115)

MINE NO. 27

Mined Out	(834,021)
Estimated Adjustment	(42,839)
Yield Loss	(132,307)
Net Change	(1,009,167)

BUFFALO CREEK NO. 2

Reserves on January 1, 1967	1,166,570
In Process of being sold	(1,166,570)

- 0 -

MEMO: Changes in Deep Reserve Tonnage During 1967

BUFFALO CREEK NO. 2

Reserves on January 1, 1967....	3,223,378
In Process of being sold.....	(3,223,379

ROUND PRAIRIE FIELD

Estimate Adjustment.....	(164,226)
New Lands.....	869,406
Net Change.....	705,180

ROUND PRAIRIE FIELD (Isolated)

Estimate Adjustment.....	(100,180)
Net Change.....	(100,180)

MEMO: Changes in Strip Reserve Tonnage During 1966

MINE NO. 9

Mined Out	(931,826)
Estimate Adjustment	23,971
Yield Loss	(25,673)
New Lands	109,180
Net Change	(824,348)

MINE NO. 11

Mined Out	(2,080,251)
Estimate Adjustment	(647,251)
Yield Gain	94,347
New Lands	1,351,245
Net Change	(1,281,910)

MINE NO. 17 (North)

Mined Out	(2,033,621)
Estimate Adjustment	340,837
Yield Gain	97,609
Net Change	(1,595,175)

MINE NO. 17 (South)

New Lands	941,836
Net Change	941,836

MINE NO. 27

Mined Out	(809,240)
Yield Loss	(134,226)
Net Change	(943,466)

BUFFALO CREEK NO. 2

Lease Expired	(232,820)
Net Change	(232,820)

MEMO: Changes in Deep Reserve Tonnage During 1966

BUFFALO CREEK NO. 2

Lease Not Renewed.....	(105,479)
Net Change.....	(105,479)

MEMO: Changes in Strip Reserve Tonnage During 1965

MINE NO. 9

Mined Out	(840,705)
Estimate Adjustment	75,600
Yield Loss	(66,549)
New Lands	4,113,345
Net Change	3,281,691

MINE NO. 11

Mined Out	(1,825,255)
Estimate Adjustment	(591,629)
Yield Loss	(285,576)
New Lands	9,278
Net Change	(2,693,182)

MINE NO. 17 (North)

Mined Out	(1,992,089)
Estimate Adjustment	(251,908)
Yield Gain	152,293
New Lands	355,407
Net Change	(1,736,297)

MINE NO. 17 (South)

New Lands	1,775,380
Net Change	1,775,380

MINE NO. 25

Mined Out	(20,163)
Estimate Adjustment	948
Net Change	(19,215)

MINE NO. 27

Mined Out	(670,429)
Yield Loss	(15,361)
New Lands	1,439,634
Net Change	753,844

Changes in Strip Reserve Tonnage During 1965 (Cont')

NORTH CANTON FIELD

Leased to Truax-Traer	(10,177,773)
Leased from Truax-Traer	4,014,785
Net Change	(6,162,988)

HAYDEN FIELD, COLORADO

New Lands	12,522,000
Net Change	12,522,000

Changes in Deep Reserve Tonnage During 1965

BUFFALO CREEK NO. 2

Lease not renewed	(464,640)
Net Change	(464,640)

ROUND PRAIRIE FIELD

New Lands	6,507,944
Estimate Adjustment	(338,769)
Net Change	6,169,175

MEMO: Changes in Strip Reserve Tonnage from 8/1/64 to 12/31/64

MINE NO. 9

Mined Out	(407,422)
Estimate Adjustment	(12,119)
Yield Gain	7,676
Net Change	(411,865)

MINE NO. 11

Mined Out	(816,707)
Estimate Adjustment	(15,364)
Yield Gain	5,000
New Lands	155,224
Net Change	(671,847)

MINE NO. 17 (North)

Mined Out	(901,959)
Estimate Adjustment	(140,278)
Yield Gain	100,000
New Lands	122,390
Net Change	(819,847)

MINE NO. 25

Mined Out	(87,154)
Estimate Adjustment	11,189
Net Change	(75,965)

MINE NO. 27

Mined Out	(267,310)
Yield Loss	(28,250)
New Lands	220,500
Net Change	(75,060)

Changes in Deep Reserve Tonnage from 8/1/64 to 12/31/64

ROUND PRAIRIE FIELD

New Lands	232,320
Net Change	232,320

MEMO: Changes in Strip Reserve Tonnage During Fiscal Year 1964

MINE NO. 9

Mined Out	(840,871)
Yield Loss	(23,569)
Estimate Adjustment	(30,949)
Measurement Adjustment	138,045
New Lands	1,400,373
Reactivated Reserves	354,000
Net Change	997,029

MINE NO. 11

Mined Out	(1,892,040)
Yield Loss	(33,098)
Estimate Adjustment	(67,591)
Measurement Adjustment	40,774
New Lands	1,403,971
Net Change	(547,984)

MINE NO. 17 (North)

Mined Out	(1,848,954)
Yield Gain	98,212
Estimate Adjustment	207,544
New Lands	594,766
Net Change	(948,432)

MINE NO. 17 (South)

New Lands	1,113,200
Net Change	1,113,200
Net Change Mine #17 North & South	164,768

MINE NO. 25

Mined Out	(263,937)
Estimate Adjustment	(2,404)
New Lands	16,000
Net Change	(250,341)

Changes in Strip Reserve Tonnage (Cont'd)

MINE NO. 27

Mined Out	(717,084)
Yield Loss	(52,060)
Yield Gain	6,683
New Lands	1,149,232
Net Change	386,771

NORTH CANTON FIELD

New Lands	996,600
Net Change	996,600

INDUSTRY FIELD

New Lands	600,000
Net Change	600,000

Changes in Deep Reserve Tonnages During Fiscal Year 1964

ROUND PRAIRIE FIELD

New Lands	13,293,081
Net Change	13,293,081

MEMO: Changes in Strip Reserve Tonnage During Fiscal Year 1963

MINE NO. 9

Mined	(804,920)
Yield Loss	(62,311)
Yield Gain	64,332
Net Change	(802,899)

MINE NO. 11

Mined	(1,934,447)
New Lands	3,218,264
Yield Loss	(61,850)
Yield Gain	78,847
Estimate Adjustment	(1,647)
Adjustment in Measurement	17,504
Net Change	1,316,671

MINE NO. 17 (North)

Mined	(1,339,455)
New Lands	324,219
Yield Gain	114,578
Estimate Adjustment	(11,183)
Net Change	(911,841)

MINE NO. 17 (South)

New Lands	559,000
Net Change	559,000
Net Change Mine #17 North & South	(352,841)

MINE NO. 25

Mined	(265,583)
Yield Loss	(17,031)
Net Change	(282,614)

MINE NO. 27

Mined	(602,158)
New Lands	579,300
Yield Loss	(27,920)
Estimate Adjustment	(172,174)
Net Change	(222,952)

Changes in Strip Reserve Tonnage Cont'd

NORTH CANTON FIELD

New Lands	4,761,855
Estimate Adjustment	69,960
Net Change	4,831,815

INDUSTRY FIELD

New Lands	251,440
Net Change	251,440

Changes in Deep Reserve Tonnages During Fiscal Year 1963

BUFFALO CREEK NO. 2

Lease Dropped	(290,400)
Net Change	(290,400)

ROUND PRAIRIE FIELD

Change to Round Prairie Deep Coal - Isolated	(545,981)
Net Change	(545,981)

MEMO: Changes in Strip Reserve Tonnage During Fiscal Year 1952

MINE NO. 9

Mined	819,313
Yield Loss	953
Yield Gain	47,612
Net Change	772,659

MINE NO. 11

Mined	1,662,957
Yield Loss	2,004
Yield Gain	34,389
Estimate Adjustment	4,298
Adjustment in Measurement	7,728
Net Change	1,626,142

MINE NO. 17 (North)

Mined	1,220,592
New Lands	525,577
Yield Loss	2,321
Yield Gain	27,500
Estimate Adjustment	6,608
Net Change	663,728

MINE NO.17 (South)

New Lands	2,888,892
Net Change	2,888,892

Net Change Mine No. 17 North & South 2,225,164

MINE NO. 25

Mined	250,394
Estimate Adjustment	12,429
Yield Loss	618
Estimate Adjustment	68,053
Yield Gain	19,844
New Lands	632,179
Net Change	456,635

MINE NO. 27

Mined	707,850
Yield Gain	37,776
New Lands	138,000
Net Change	882,074

Changes in Strip Reserve Tonnage (Cont'd)

NORTH CANTON FIELD

New Lands	2,413,409

SALT FORK FIELD

Cancelled - C. W. Dukes	691,152
Net Change	691,152
Grand Total Salt Fork	- 0 -

MEMO: Changes in Strip Reserve Tonnage During Fiscal Year 1961

MINE NO. 9	
Mined	864,659
Yield Loss	19,756
Net Change	884,415
MINE NO. 11	
Mined	1,447,814
New Lands	4,056
Estimate Adjustment	314,048
Yield Loss	1,044
Net Change	1,758,840
MINE NO. 17	
Mined	1,306,751
New Lands	144,000
Estimate Adjustment	5,120
Yield Gain	13,450
Net Change	1,164,181
MINE NO. 25	
Mined	211,773
New Lands	291,457
Estimate Adjustment	53,516
Net Change	133,200
MINE NO. 27	
Mined	516,570
New Lands	671,500
Estimate Adjustment	539,857
Yield Loss	2,194
Net Change	417,131
NORTH CANTON FIELD	
New Lands	524,100
INDUSTRY FIELD	
New Lands	169,300

MEMO: Changes in Deep Reserve Tonnage During Fiscal Year 1961

ROUND PRAIRIE FIELD	
New Lands	1,974,720

MEMO: Changes in Strip Reserve Tonnage During Fiscal Year 1960

MINE NO. 9	
Mined	950,038
Estimate Adjustment	3,539
Yield Loss	30,571
Net Change	983,948
MINE NO. 11	
Mined	1,012,262
New Lands	1,602,320
Estimate Adjustment	461,388
Yield Loss	33,966
Net Change	94,708
MINE NO. 11 (CLINCH)	
Mined	226,056
Yield Gain	12,299
Estimate Adjustment	23,889
Net Change	189,868
MINE NO. 17	
Mined	1,320,996
Estimate Adjustment	352,361
Yield Loss	43,815
Net Change	1,012,450
MINE NO. 25	
Mined	327,635
Yield Gain	42,405
Net Change	285,230
MINE NO. 27	
Mined	23,629
Estimate Adjustment	649,379
New Lands	3,841,878
Net Change	3,268,870
INDUSTRY FIELD	
New Lands	2,553,600
NORTH CANTON FIELD	
New Lands	521,400

MEMO: Changes in Deep Reserve Tonnage During Fiscal Year 1960

ROUND PRAIRIE FIELD
New Lands---------- 1,290,700

MINE NO. 21
Sold---------- 6,489,403

MEMO: Changes in Strip Reserve Tonnage During Fiscal Year 1959

MINE NO. 9	
Mined	84?,830
Yield Loss	26,949
Estimate Correction	21,263
Net Change	83?,481
MINE NO. 11	
Mined	34,316
New Lands	805,190
Net Change	770,874
MINE NO. 11 (CLINCH)	
Mined	1,120,669
Estimate Correction	3?,371
New Lands	181,220
Yield Gain	30,452
Net Change	950,868
MINE NO. 17	
Mined	1,251,453
New Lands	3,056,000
Lease Dropped	2?,700
Estimate Correction	70,432
Yield Loss	7?,005
Net Change	1,635,420
MINE NO. 19	
Mined	130,229
Transferred to Mine #21 Deep Reserves	93,714
Net Change	223,943
MINE NO. 25	
Mined	303,116
Estimate Correction	86,422
Net Change	221,694
BANNER FIELD	
New Lands	1,439,000
Estimate Correction	7?,643
Net Change	1,364,357
BUFFALO CREEK MINE NO. 2	
Lease Expired	?,087,06?

NEED: Changes in Deep Reserve Tonnage During Fiscal Year 1957

BUFFALO CREEK MINE #2	
Lease Expired	297,159
Estimate Correction	90,153
Net Change	207,342
MINE #21	
Transferred from Mine #19 Strip Reserve	1 101,324
MOUND PRAIRIE FIELD	
New Lands	20,962,342
SALT FORK FIELD	
New Lands	691,152

MEMO: Changes in Reserve Tonnage During Fiscal Year 1958

MINE NO. 9	
Mined	794,668
Estimate Correction	43,046
Yield Loss	20,925
Little Sister Trade	607,607
Net Change	251,020
MINE NO. 11	
Quit claim 5 acres to Sacred Heart Catholic Church	44,120
Union Colliery Purchase	4,476,414
Re-estimate of adjacent property to the Union Collieries purchase	1,323,322
Net Change	5,755,656
MINE NO. 11 (CLINCH)	
Mined	1,252,822
New Lands	328,518
Estimate Correction	61,704
Yield Gain	37,901
Net Change	724,699
MINE NO. 17	
Mined	1,099,162
Dropped Lease	13,340
Estimate Correction	67,659
Yield Loss	13,304
New Lands	1,764,700
Net Change	571,235
MINE NO. 19	
Mined	247,079
Transferred from deep reserves Mine #21	221,958
Yield Gain	10,701
Net Change	14,420
MINE NO. 25	
Mined	303,519
Estimate Correction	75,710
Yield Loss	1,736
Net Change	380,965
GLASFORD-DANNER FIELD	
New Lands	145,824
BUFFALO CREEK #2 FIELD	
New Lands	2,496,463
MINE #21	
Transferred to #19 strip reserves	190,276

Changes in Reserve Tonnage (Cont'd)

LEASE TO UNION COLLIERY (Inactive Deep)

Lease discontinued - Included in Mine #11 Strip Reserves---------- 883,084

DEEP COAL RESERVES - MINE NO. 11

Union Colliery Purchase----------5,114,180

DEEP COAL RESERVE - BUFFALO CREEK #2 (Inactive Deep)

New Lands----------4,371,209

(D) POSSIBLE ACQUISITIONS

THE UNITED ELECTRIC COAL COMPANIES
Possible Acquisitions
Cuba - Mine #9
Fulton County, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
ringe Tracts	308	50	300,000	Acquisition Doubtful. Coal in Islands
Total	308	50	300,000	

his mine has operated over 40 years, and is bounded by the City of uba, outcrop of the No. 5 and No. 6 coals on the west and south, orth and east by old works of other companies.

/1/70

THE UNITED ELECTRIC COAL COMPANIES
Possible Acquisitions
Fidelity - Mine #11
Perry County, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Northwest Field				
Walker	120	60	Less than 500,000	Negotiating
Fringe Tracts	-	-	250,000	Negotiating
Total	120	60	Less than 750,000	
Kathleen or Southwest Area				
Harsha	40	20	160,000	Cannot Acquire to Date
Eisenhauer	20	10	80,000	Negotiating
Sutter	80	60	500,000	Negotiating
Fringe Tracts	-	-	300,000	Negotiating
Total	140	90	1,040,000	

Mine was started in 1929. Land acquisition in 1926, and only hard to buy reserves remain. Mine is bounded on the north by mined out ground, on the east by Du Quoin and old works, south by old works and cropline of No. 6 coal, on the west by cropline and cutout several miles wide, west of which the coal has been removed. As far as is known there is no minable coal in the No. 6 or any other vein, deep or strip, that can be added.

3/1/70

THE UNITED ELECTRIC COAL COMPANIES
Possible Acquisitions
Buckheart - Mine #17
Fulton County, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Bull	80	75	500,000	In Estate - Cannot Buy at Present
McLouth	160	80	500,000	Extremely doubtful
Total	240	155	1,000,000	

The mine has operated since 1937. Bounded on the north by old works, unminable coal and cutout of coal, on the east by the cropline of No. 5 coal, south by old works and end of coal field, and on the west by large cutout and cropline of No. 5 coal.

3/1/70

THE UNITED ELECTRIC COAL COMPANIES
Possible Acquisitions
Banner - Mine #27
Peoria & Fulton Counties, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Fuller	30	30	100,000	Not drilled.

Mine No. 27 lies in the river bottom and is surrounded by natural boundaries. North by a range of hills containing little coal recoverable by stripping or underground mining, east by a narrow river bottom and levee, south by the Illinois River and west by Rice Lake. 462 acres north and northeast of the field has been drilled and dropped.

3/1/70

THE UNITED ELECTRIC COAL COMPANIES
Possible Acquisitions
North Canton

Fringe Areas - When the field is opened, we may option and drill several farms adjoining the cropline, but less than 500,000 tons of additional reserves, if any, are expected. Field is limited to No. 6 coal, practically all of which has been delineated, plus a small amount of No. 5 in valleys.

572

3/1/70

DEFENDANT'S EXHIBIT NO. 60-D

THE UNITED ELECTRIC COAL COMPANIES

Possible Reserve Acquisitions at Existing Mines

I. Summary Table

Name of Mine	Reserves Dec. 31, 1969	Potential Acquisitions Tons of Coal March 1, 1970
CUBA #9	1,206,260	300,000
BUCKHEART NORTH CANTON	27,379,963	1,500,000
BANNER	5,081,691	100,000
FIDELITY	18,365,390	1,790,000
TOTAL:	52,033,304	3,690,000

3/1/70

II. Explanation of Above Table

A. Cuba Mine #9 - Fulton County, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Fringe Tracts	308	50	300,000	Acquisition Doubtful. Coal in Islands.
Total	308	50	300,000	

This mine has operated over 40 years, and is bounded by the City of Cuba, outcrop of the No. 5 and No. 6 coals on the west and south, north and east by old works of other companies.

B. Buckheart Mine #17 - Fulton County, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Bull	80	75	500,000	In Estate. Cannot Buy at Present.
McLouth	160	80	500,000	Extremely doubtful.
Total	240	155	1,000,000	

The mine has operated since 1937. Bounded on the north by old works, unminable coal and cutout of coal, on the east by the cropline of No. 5 coal, south by old works and end of coal field, and on the west by large cutout and cropline of No. 5 coal.

North Canton

Fringe Areas - When the field is opened, we may option and drill several farms adjoining the cropline, but less than 500,000 tons of additional reserves, if any, are expected. Field is limited to No. 6 coal, practically all of which has been delineated, plus a small amount of No. 5 in valleys.

3/1/70

C. Banner Mine #27 - Peoria & Fulton Counties, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Fuller	30	30	100,000	Not drilled.
Total	30	30	100,000	

Mine No. 27 lies in the river bottom and is surrounded by natural boundaries. North by a range of hills containing little coal recoverable by stripping or underground mining, east by a narrow river bottom and levee, south by the Illinois River and west by Rice Lake. 462 acres north and northeast of the field has been drilled and dropped.

3/1/70

D. Fidelity Mine #11 - Perry County, Illinois

Name	Acres	Possible Coal Acres	Possible Tons	Remarks
Northwest Field				
Walker	120	60	Less than 500,000	Negotiating
Fringe Tracts	-	-	250,000	Negotiating
Total	120	60	Less than 750,000	
Kathleen or Southwest Area				
Harsha	40	20	160,000	Cannot Acquire to Date
Eisenhauer	20	10	80,000	Negotiating
Sutter	80	60	500,000	Negotiating
Fringe Tracts	-	-	300,000	Negotiating
Total	140	90	1,040,000	

Mine was started in 1929. Land acquisition in 1926, and only hard to buy reserves remain. Mine is bounded on the north by mined out ground, on the east by Du Quoin and old works, south by old works and cropline of No. 6 coal, on the west by cropline and cutout several miles wide, west of which the coal has been removed. As far as is known there is no minable coal in the No. 6 or any other vein, deep or strip, that can be added.

3/1/70

The Following

COAL RESERVES OF LISTED COMPANIES IN ILLINOIS, INDIANA AND WESTERN KENTUCKY - 1968

61

	Company	Tons	Percentage of Total Tons Shown
1.	Peabody Coal Company	3,780,898,842	30.05%
2.	Humble Oil Company	3,250,000,000*	25.83
3.	Island Creek Coal Company	1,162,878,000	9.24
4.	Consolidation Coal Company	963,640,000	7.66
5.	Old Ben Coal Corporation	796,000,000	6.33
6.	Ayrshire Collieries Corp.	767,168,071	6.10
7.	Bell & Zoller Coal Company	550,000,000	4.37
8.	Freeman Coal Mining Corp.	483,687,408	3.84
9.	Pittsburg & Midway Coal Mining Co.	278,205,000	2.21
10.	Southwestern Illinois Coal Corp.	170,800,000	1.36
11.	The United Electric Coal Companies	121,851,616	.97
12.	Sahara Coal Company, Inc.	90,000,000	.72
13.	Morris Brothers Company	32,000,000	.25
14.	Venedy Coal Company, Inc.	27,300,000	.22
15.	Webster County Coal Corp.	25,000,000	.20
16.	Green Coal Company	20,000,000	.16
17.	Gibraltar Coal Corporation	19,091,904	.15
18.	Rialto Coal Company, Inc.	13,200,000	.10
19.	Pyro Mining Company	6,500,000	.05
20.	Black Tam Mining Company	6,000,000	.05
21.	Kirkpatrick Mining Company	5,116,000	.04
22.	Blue Bird Coal Company	2,792,500	.02
23.	R. S. & K. Coal Corporation	2,000,000	.01
24.	Russell Badgett, Jr. Coal Co.	1,200,000	.**
25.	Weirs Creek Company	1,200,000	.**
26.	Wright Coal Company	1,140,000	.**
27.	Belle Valley Coal Company, Inc.	1,097,712	.**
28.	Burge Coal Company, Inc.	550,000	.**
29.	V-Day Coal Company	500,000	.**
30.	Sherwood-Templeton Coal Co., Inc.	472,000	.**
31.	Harrisburg Coal Company	320,000	.**
32.	Barbara Kay Coal, Inc.	300,000	.**
33.	Parton Coal Company, Inc.	240,000	.**
34.	Decola Coal Company	200,000	.**
35.	Weskol Mining Company	200,000	.**
36.	B B Mining Company	30,000	.**
37.	Houston Coal Company	25,000	.**
	TOTAL	12,581,604,053	100.00%

Source: Form 250, Subpoena Questionnaire

* Source: Letter of February 19, 1968 from Humble Oil & Refining Company to Department of Justice and assumed recovery of 5,000 tons per acre. See also Respondent's Exhibit No. 184 A-F received in evidence in Federal Trade Commission Docket 8765, in the matter of Kennecott Copper Corporation, and stipulated testimony of George H. Shipley.

** Less than .01 percent.

62

TYPES OF COAL RESERVES HELD BY LISTED COMPANIES* IN

ILLINOIS, INDIANA AND WESTERN KENTUCKY - 1968

	Dedicated to Existing Mines	Other Reserves	Total
Strip	1,140,661,140	646,062,584	1,786,723,724
Deep	1,132,526,758	6,412,353,571	7,544,880,329
	2,273,187,898	7,058,416,155	9,331,604,053

* See Defendants' Exhibit 61. Tonnages for Humble Oil Company (3,250,000,000) not included.

SOURCE: Form 250, Subpoena Questionnaire.

REFERENCE: Report of Paul Weir Company, Weir Deposition Exhibit 2, pp. 23-24.

THE UNITED ELECTRIC COAL COMPANIES

COMMITTED AND UNCOMMITTED RESERVES - BY MINES

Mine	Consumer	Expiration Date	Maximum Annual Tons Committed (000)	Total Tons Committed 1/1/69 To Expiration (000)	Strippable Reserves As Of 1/1/69 (000)	Uncommitted Tons (000)	Remarks
BANNER							
	1. Marquette Cement	5-31-75	300 1/	1,925			Current - 5 Year Renewal Option*
	2. Union Carbide Corp. Linde Div.	4-30-71	90 1/	210			Current
	3. Central Ill. Public Service	5-30-79	200	2,000			Current
	TOTAL BANNER			4,135	6,057	1,922	
CUBA-BUCKHEART							
	1. Commonwealth Edison	12-31-70	2,250	4,500			Current
	2. Central Ill. Light Co.	12-31-91	1,100	20,900			Effective 1-1-73
	3. Central Ill. Light Co.	12-31-72	610 1/	2,440			Current
	4. Corn Products Co.	12-31-71	225 1/	675			Current
	5. Foote Minerals-Kemco Div.	3-31-72	50	160			Current
	TOTAL CUBA-BUCKHEART			28,675	31,113 2/	2,438	
FIDELITY							
	1. Northern States Power	3-14-70	480	480			Current - Renewal Being Negotiated **
	2. Union Electric	4-30-71	375	875			Current - Renewal Being Negotiated **
	3. Wisconsin Power & Light	12-31-78	180 1/	1,000			Current
	4. Interstate Power	12-31-75	100	700			Current - 10 Year Renewal Option *
	5. Iowa Public Service	3-30-72	100	375			Current
	6. Dairyland Power Coop.	12-31-80	90 1/	1,060			Current
	7. City of Fairfield	4-30-71	25 1/	60			Current
	8. Jn. Deere Dubuque	3-31-79	20	35			Current
	9. Jn. Deere Waterloo	3-31-79	30	40			Current
	Tonnage Committed to Current Negotiations			10,700**			No. States P.; Un. Elec., KIPSCO
	TOTAL FIDELITY			15,315	15,441	7,126	
	TOTAL ALL MINES			48,938	52,611	11,486	
	Tonnage Subject to Buyers' Unexercised Renewal Options					2,100* 6,186	

1/ Based on current plant requirements or portion thereof
2/ Annual average of escalating commitments
3/ Includes North Canton

SOURCE: Records of the Company

5/9/69

EXHIBIT NUMBER 63

WISCONSIN ELECTRIC POWER COMPANY
231 WEST MICHIGAN STREET
MILWAUKEE, WISCONSIN 53201

DEFENDANT'S EXHIBIT 66

May 21, 1968

Mr. John T. Cusack
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634, United States Courthouse
Chicago, Illinois 60604

60-0-37-920
DEPARTMENT OF JUSTICE
MAY 22 1968
DIVISION OF RECORDS
Cusack

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)
60-0-37-920

Dear Mr. Cusack:

This is in reply to your letter of April 9 addressed to Mr. C. F. John requesting information in regard to the above referenced civil action.

The information requested in paragraphs 1 and 2 of your letter is detailed in Tables I and II attached. All coal purchased for the following generating stations for the years 1964 through 1967 was delivered to storage docks by lake vessels during the navigation season for Lake Michigan, which normally extends from April 1 to December 1 each year:

Oak Creek Power Plant
Port Washington Power Plant
Commerce Street Power Plant
East Wells Street Power Plant

This coal was consumed approximately from mid-April of the year in which it was delivered to mid-April of the following year. Coal purchased for use at our Lakeside Power Plant for the same years was consumed during the calendar year in which it was purchased. The footnotes of Tables I and II explain the variance in the period coal was purchased and consumed.

In response to your paragraph 3, during the referenced period facilities for generating electricity by utilizing oil and gas were available at the Commerce Street Power Plant. Details in regard to gas and oil consumption are given in Table III attached. Boiler #25 of this plant is the only unit so equipped and was equipped to burn gas or oil exclusively since November, 1964. This unit has a capability of 22,000 kw

when supplying 230,000 lbs. per hour of steam for our heating utility. The footnotes to Table III explain the seasonal usage of gas and oil and the portion of each used for steam production at this plant.

In response to paragraph 4, no facilities were available for generating electricity by nuclear energy through the years 1964 through 1967.

Facilities for generating electricity from other sources as requested in paragraph 5 are limited to hydroelectric and diesel plants of Wisconsin Michigan Power Company, a wholly owned subsidiary of Wisconsin Electric Power Company. The information which you requested regarding these facilities is given in Table IV attached.

Data in response to paragraph 6 of your letter are not available.

You will note from the several documents attached that the majority of our coal is derived from mines in Illinois and western Kentucky. We believe that the acquisition by General Dynamics Corporation of the United Electric Coal Companies made it possible for the latter companies to have available financial resources for the development of mining properties and to increase the availability of coal sources from these regions.

You may wish to correct your records to indicate that Mr. C. F. John retired as Vice President in Charge of Power on December 31, 1965.

Very truly yours,

Robert H. Gorske

Robert H. Gorske General Counsel

Attach.

DEFENDANT'S EXHIBIT 67

COST FOR GAS FUEL VS. COAL FUEL FOR PEKIN BOILER HOUSE

During 1967, natural gas was used in the plant for various process uses while coal was used exclusively in the boiler house.

To determine the effect of burning all gas in the boiler house instead of coal, data from monthly boiler efficiency calculations was taken. The total heat required in coal fuel during grind and no grind periods and the average boiler efficiency was tabulated. This heat was converted into equivalent gas heat on the basis of gas boilers operating at 83% efficiency.

The increased amount of gas used on the boilers is all used at the lowest contract rate. There is no separate demand charge for gas, any demand rate consideration is included in the contract rates.

The following data summarizes the above calculations for each month during 1967.

Cost of gas fuel for boilers to supply an equivalent amount of heat as from coal for the year 1967 (based on gas, incremental rate, grind, and no grind)	$2,036,800 per year
Actual cost of coal burned in boiler house during year 1967 (grind and no grind)	$1,191,909 per year
Additional cost of fuel to operate boiler house on gas instead of coal (based on incremental gas rate, grind and no grind)	$ 844,891 per year

DEF 2/12/68

COMPANY LETTER

Moffet Technical Center
Argo, Illinois
February 13, 1968

TO: R. Meadowcroft

FROM: D. F. Franzen

SUBJECT: *Gas Firing In Boiler Houses at Argo and Pekin*

The Purchasing Department and the Pekin Plant have assured me, through their contacts with the gas companies, that sufficient gas is available to convert the steam generating facilities at Argo and Pekin from burning coal to gas.

The additional cost of fuel to operate the boiler houses on gas instead of coal, based on incremental gas cost and for the grind and no grind period of 1967 is

Argo, $984,000 per year

Pekin, $845,000 per year

DFF:pld

COMPANY LETTER

Moffet Technical Center
Argo, Illinois
February 23, 1968

TO: R. Meadowcroft

FROM: D. F. Franzen

FILE: Air Pollution

SUBJECT: *All Gas Firing for Boilers, Argo and Pekin*

In my letter of February 23 on this subject, I should have included the additional expense of about $50,000 per boiler for combustion controls at both the Argo and Pekin Plants.

	Total Cost of Combustion Control
Pekin—Boilers "A", "B", and "C" at $50,000	$150,000
Argo—Boilers 1, 2, and 3 at $50,000	150,000

DFF:pld

COMPANY LETTER

Moffet Technical Center
Argo, Illinois
February 23, 1968

TO: R. Meadowcroft

FROM: D. F. Franzen

FILE: Air Pollution

SUBJECT: *Gas Vs. Coal for Entire Pekin Boiler House*

My letter to you, dated February 13, 1968, indicated the additional cost that would have been entailed for the year 1967, if the Pekin Plant had burned all gas instead of coal was $845,000 per year.

Estimated operating savings which would be achieved if all coal burning were eliminated are:

Labor-coal and ash handling	$ 85,000 per year
Maintenance on coal unloading and conveying, coal bunkers, scales, feeders, pulverizers, stokers and ash handling equipment.	60,000
Power used by pulverizers, stokers and other coal and ash handling equipment	38,000
Fly ash and cinder disposal	20,000
Sluice water for ash system	5,000
Total direct savings	$208,000 per year
It may be necessary to install additional dust collecting facilities on each of Boilers "A" and "B" and "C" if we were to continue to burn coal. This total cost is roughly estimated to cost about $650,000. Potential operating savings by not having to install this equipment based on 5% maintenance and 5% depreciation is	65,000 per year

It should be noted that the above dust collecting facilities will not eliminate SO_2 problems in the flue gas and at

some time in the future, additional expenditures may be involved.

Additional intangible items resulting from all gas burning instead of coal are:

1. The coal track could be used for other process requirements such as hydrol or syrup systems.
2. Extended boiler life, less abrasion problems.
3. May be allowed extended periods between boiler inspections.
4. Reduction in mechanical stores items.

DFF:pld

G726

THOMPSON, HINE AND FLORY
NATIONAL CITY BANK BUILDING
CLEVELAND, OHIO 44114

August 15, 1968

DEFENDANT'S EXHIBIT 68

John T. Cusack, Esq.
Antitrust Division
Department of Justice
Room 2634
U. S. Court House
Chicago, Illinois 60604

Re: U. S. v. General Dynamics, et al.
Civil Action No. 67 C 1632 (N.D. Ill.)

Dear Mr. Cusack:

This has reference to your letter of August 7, 1968, in the captioned matter in which you asked confirmation of certain facts provided to you by Mr. Strausbaugh during your August 2 visit to Medusa's office.

Mr. Strausbaugh advises that there are four kilns at Dixon. Three of these kilns are 150 feet in length, are considered "short" kilns, and use coal having a maximum sulphur content of 1.2%.

The remaining kiln is 400 feet in length, is considered a "long" kiln, and uses coal having a maximum sulphur content of 3.2%.

I trust that the foregoing will clarify the matters about which you made inquiry in your August 7 letter.

Sincerely,

John McClatchey

JFMcClatchey/rg

cc: Mr. L. C. Strausbaugh

60-0-37-920
DEPARTMENT OF JUSTICE
AUG 1968

DEFENDANT'S EXHIBIT 69

GENERAL PORTLAND CEMENT COMPANY

4400 REPUBLIC NATIONAL BANK TOWER, P.O. BOX 324, DALLAS, TEXAS 75221
Area Code 214 742-1581

September 17, 1968

Department of Justice
Room 2634
United States Courthouse
Chicago, Illinois 60604

Attention: Mr. Ronald L. Futterman

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N. D. Illinois)

Gentlemen:

The following information is submitted as requested by Mr. Futterman by phone. This is in lieu of questions submitted in a letter dated July 25, 1968 by Mr. John T. Cusak, Attorney, Midwest Office, Antitrust Division.

1. We do not purchase, nor have we purchased, any coal from mines located in the state of Illinois. This is true for two reasons. First, the freight from Illinois mines to our plants in Paulding, Ohio and Fredonia, Kansas makes the cost prohibitive; and secondly, the quality of the coal is poor since it does not come from deep mines. Mr. Futterman has asked about our policy relative to sulphur content and the methods for compensating for excessive sulphur. Sulphur is not a major factor in our purchases of coal because it combines with our product. Coal is purchased exclusively on BTU content and is purchased by the seam from which it is mined.

   Since mid-1963 all coal was purchased from North American Coal Corporation from their mine at Powhatan Point, Ohio. Purchases for the years in question were:

   1964 - 98,350.65 tons
   1965 - 99,228.80 tons
   1966 - 102,290.49 tons
   1967 - 90,760.30 tons

Cleared
61-1-37-0
DEPARTMENT OF JUSTICE
SEP 23 1968

3. Cement manufactured in our Paulding, Ohio plant is sold in Ohio, Indiana and Michigan. Our Fredonia, Kansas plant ships into the states of Kansas, Missouri, Arkansas and Oklahoma. Neither plant ships into the state of Illinois. Freight rates are such that we would not be competitive in this market.

Our Fredonia, Kansas plant is located in what is well known as the gas-belt, its primary fuel being gas. It does, however, on occasion, use coal during cold weather when the gas supply is curtailed for home consumer use. Our gas supply was last curtailed in February, 1963 during which period we used 171 tons of coal from inventory. Our last purchase of coal for kiln fuel at this plant was December, 1960 and the coal at that time was purchased from Pittsburgh Midway Coal Company from their mine in West Mineral, Kansas.

Yours truly,

R. M. Schafer
Treasurer

DEFENDANT'S EXHIBIT 70

MISSISSIPPI RIVER CORPORATION
8900 CLAYTON ROAD
ST. LOUIS, MISSOURI 63124
PHONE 991-8900

CLEON L. BURT
VICE PRESIDENT-LAW

September 29, 1969

Mr. Hugo Sims
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Re: United States v. General Dynamics Corporation, et al., Civil Action No. 67 C 1632 (N.D. Ill.)

Dear Mr. Sims:

In our conversation of several days ago, you asked me certain questions about the burning of coal in our cement plant at Selma, Missouri. The questions, as I understood them, and the answers thereto are as follows:

1. Is it intended that our No. 2 Kiln, which is equipped to burn coal as an alternate fuel, will be switched to coal at times in the future as and when the gas supply is interrupted?

   - The answer to this question is that we do intend and expect to switch the No. 2 Kiln to the burning of coal when the gas supply is interrupted.

2. You inquired as to the usual period of time during which the natural gas supply to our plant is interrupted or curtailed.

   As to this, I cannot give you any better answer than I did verbally. As you know, the amount of interruption depends on numerous factors, the principal among which are the physical deliverability conditions of the pipeline supplier and the demands of domestic and commercial users. During the 1968-69 heating season, I am informed that gas was curtailed at the plant for between three and four months; whereas in the preceding year, the curtailment was much less severe. Accordingly, the curtailment can vary from almost nothing to three or four months. As a very rough approximation, I would say that 90 days out of the year might be a reasonable period on the average for cement plant gas curtailment.

Very truly yours,

Cleon L. Burt

CLB:bjs

SUBJECT TO PROTECTIVE ORDER

HALL, PATTERSON, TAYLOR, McNICOL & MARETT
HALL, CUNNINGHAM & HAYWOOD
41 EAST 42ND STREET
NEW YORK, N.Y. 10017
CABLE ADDRESS "LAWHUNTER"
TEL. MU 2-3080

DEFENDANT'S EXHIBIT 71

May 27, 1968

Air Mail

John T. Cusack, Esq.
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Dear Mr. Cusack:

In response to your letter to American Maize-Products Company dated April 15, 1968, the following information was gathered by American Maize-Products Company in response to your inquiries:

Under paragraph 1, total tons or dollar value of annual coal purchases for the years 1964 through 1967:

Year	Quantity Tons	Value
1964	117,365	$ 731,601
1965	112,639	697,196
1966	117,449	743,945
1967	106,483	693,437

The tonnage by mine for the years 1964 through 1967:

Year	Orient #3	Orient #4	Orient #5	Total
1964	111,858	5,784	---	117,642
1965	40,923	4,210	70,241	115,374
1966	6,418	368	108,486	115,272
1967	6,187	---	101,310	107,497

There is as you will notice, a difference between the figures showing tonnage by mine as opposed to Maize's coal purchases. The tonnage by mine figures are loaded weights at the mine. The annual coal purchases are the unloaded weights and the difference is lost in shipping.

60-0-37-925
DEPARTMENT OF JUSTICE
MAY 29 1968

The coal is used in coal burning boilers for the generation of steam. The steam in turn is used primarily in Maize's production department for evaporation and drying of Maize's products and for space heating.

As a secondary use the steam passes through turbines for the generation of electricity. The coal is burned in pulverized coal burning, high pressure boilers, which are also equipped to burn oil and gas as secondary fuels. The coal burning boilers are also equipped with continuous pilots, fueled by either gas or oil. Oil is burned in these boilers only when the coal supply is interrupted and gas is not available. Gas is the preferred secondary fuel. When interruptible gas is available, it is used in preference to all other fuels.

Annual purchases of fuel oil and gas are listed below:

Year	Quantity-Barrels	As Tons Of Coal	Value
1964	12,273	3,515	$ 38,968
1965	10,757	3,080	33,161
1966	11,569	3,313	34,417
1967	28,695	8,217	82,508

Year	Quantity-Cubic Feed	As Tons Of Coal	Value
1964	1,683,575,500	76,526	$ 631,749
1965	1,714,460,000	77,930	656,467
1966	1,879,110,000	85,414	771,827
1967	1,897,243,300	82,148	767,889

In addition to the coal burning equipment Maize does have package boilers which are equipped to burn oil or gas. Oil is the primary fuel of these boilers except when Interruptible gas is available. The package boilers are preferred over coal burning boilers because of the lower initial capital investment and the reduced time between ordering and start-up. They are also preferred because of the rising hue and cry to air pollution.

The gas as shown for the four years was not all consumed in the boilers. Maize does have gas fired feed dryers, gas fired starch dryers, and gas fired oil heating equipment for the production of dextrines. Gas is the only fuel which can be used in the drying and dextrinization processes.

The decision and reasons for burning a particular fuel is governed primarily by cost. The unit cost of Maize various fuels are as follows:

Coal	.02465	$/Therm
Oil	.04607	$/Therm
Gas (Firm)	.0483	$/Therm
Gas (Interr)	.0400	$/Therm

The plant can be equipped to convert from coal to gas or oil in the coal burning boilers with a few changes in piping and controls. This would probably require a capital investment of approximately $10,000. The removal, however, of the coal handling and burning equipment and the ash handling and disposing equipment would be much more expensive. No estimate is available on the cost of these removals.

There is no question that if Maize ever discontinued the burning of coal for any appreciable period, the possibility of ever returning to coal burning equipment would be very slim. It would not be practical to try to "moth-ball" the coal handling, milling and burning equipment.

If we can be of any further assistance, please do not hesitate to call on us.

Very truly yours,

Charles Egan

Charles J. Egan, Jr.

CJE,Jr./acg

INLAND STEEL COMPANY

DEFENDANT'S EXHIBIT 72

GEORGE A. RAHNEY
VICE PRESIDENT AND GENERAL COUNSEL

May 20, 1968

ANSWERED BY LETTER DATED 5-XX-68

Mr. John T. Cusack
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634, United States Courthouse
219 South Dearborn Street
Chicago, Illinois 60604

60-D-37-4[illegible]
DEPARTMENT OF JUSTICE
MAY 21 1968
CHICAGO, ILL.
Cusack

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)

Dear Sir:

In response to your letter dated April 15, 1968, this will advise as follows:

1. Exhibit I attached hereto sets forth the net tons and dollar value delivered of metallurgical coal and steam coal purchased from firms supplying Inland Steel Company's East Chicago, Indiana, facility in each of the years 1964 through 1967. Mine source of coal where known is furnished.

Metallurgical coal is consumed in coke batteries for the production of coke for the blast furnaces. Steam coal is used to fire boilers for the production of steam.

2. Inland's East Chicago facility consumes certain other energy fuels for the purpose or purposes for which coal is consumed. In addition to steam coal, certain of the electric generating stations burn purchased petroleum coke, natural gas and fuel oil. Fuel oil is also consumed in the blast furnaces. Exhibit II attached hereto lists the quantities and

dollar value of the aforementioned petroleum coke, natural gas and fuel oil purchased in each of the years 1964 through 1967. The exhibit does not include blast furnace gas or coke oven gas consumed in certain of Inland's generating stations inasmuch as these are by-products produced within the plant and not purchased.

3. The following sets forth the reasons why Inland's East Chicago facility has not exclusively utilized one energy fuel in those instances where other energy fuels in addition to coal are consumed:

(a) In the blast furnaces, fuel oil is injected because (i) Inland's coke production is not sufficient to cover its total coke requirements and (ii) additional charging capacity is available in the skips for ore. For these purposes and in the quantities required fuel oil is cheaper, in general, than purchased coke.

(b) The use of different energy fuels in each of Inland's generating stations is dependent on the design characteristics of the station. In one generating station fuel oil is used to cover shortages in available powdered coal, the economics of fuel oil vs. powdered coal being approximately equal. A second generating station burns blast furnace gas, coke oven gas and fuel oil, the facility not being designed to consume coal. At a third generating station coal is the primary fuel, but petroleum coke and natural gas, when the latter is available, are burned as substitutes for coal for economic reasons.

Coal is not consumed in the open hearth furnaces, the basic oxygen furnaces or the reheating furnaces.

The information furnished on the enclosed exhibits has been prepared from a variety of internal sources. We cannot vouch for its accuracy in every respect. For example, with respect to steam coal purchases, we have been obliged in certain instances to estimate freight costs to arrive at delivered values.

We know of no documentation needed or helpful to substantiate or more fully explain the information herewith submitted.

I trust you will treat confidentially the information herewith voluntarily furnished to you.

Very truly yours,

George A. Ranney

George A. Ranney
Vice President and
General Counsel

GAR/jw
Enclosures

May 20, 1968

Exhibit I

INLAND STEEL COMPANY

METALLURGICAL COAL PURCHASES

Supplier	Mine	1964 Net Tons	1964 Delivered Value	1965 Net Tons	1965 Delivered Value	1966 Net Tons	1966 Delivered Value	1967 Net Tons	1967 Delivered Value
Inland Steel Co. *	Wheelwright, Ky.	1,549,704	$15,605,519	1,638,139	$16,446,916	135,653	$ 1,356,530		
Island Creek Coal Co.	Wheelwright, Ky.					1,569,262	15,849,546	1,676,894	$17,255,239
Island Creek Coal Co.	Bartley #6, W. Va.					108,567	1,155,153	100,638	1,105,005
Freeman Coal Mining Corp.	Orient #3, Ill.	307,474	2,410,596	330,095	2,558,236	401,217	3,125,480	386,267	3,009,020
Old Ben Coal Corp.	Old Ben #21, Ill.	73,745	555,300	38,637	291,709	58,357	434,176	250,310	1,937,399
Bishop Coal Co.	Bishop, W. Va.	1,701,208	18,645,240	1,655,609	18,128,919	1,514,434	16,704,207	1,563,145	17,538,487
Jewell Ridge Coal Corp.	Jewell Valley, Va.	234,191	2,494,134	229,715	2,492,408	169,088	1,868,422		
The Pittston Co.	Jewell Valley, Va.					169,088	1,868,422	123,206	1,452,599
Consolidation Coal Co.	Jenkinjones, W. Va.							55,766	639,078
		3,866,322	$39,710,789	3,892,195	$39,918,188	4,125,666	$42,361,936	4,156,226	$42,936,827

STEAM COAL PURCHASES

Freeman Coal Mining Corp.		94,806	$ 627,595	6,404	$ 47,708	3,217	$ 24,128		
Sterling-Midland Coal Co.		42,400	308,213	19,932	144,766	2,049	15,366		
Bell & Zoller Coal Co.		43,077	263,684	12,427	87,051	5,660	42,217	18,878	$ 140,076
Royal Fuel Corp.		13,803	101,472	38,173	224,457	23,130	146,697	150,208	946,332
Republic Coal & Coke Co.		46,071	321,117	58,447	331,484	41,901	250,568	112,286	782,632
United Electric Coal Cos.		62,416	424,529			2,524	15,019		
West Kentucky Coal Co.		7,342	56,679						
Island Creek Coal Co.				5,210	37,879	1,035	7,161		
O'Keefe Bros. Coal Co.				69,825	420,346				
Southern Illinois Co-op Coal Sales Co.				227,032	1,210,080	294,876	1,724,412	27,095	176,118
		309,915	$ 2,103,289	437,450	$ 2,503,771	374,392	$ 2,225,568	308,467	$ 2,045,158

*, Coal supplied from Inland Steel Co., Wheelwright, Ky. Mine, valued at market.

May 20, 1968

Exhibit II

INLAND STEEL COMPANY

PURCHASES OF CERTAIN FUELS FOR PURPOSES STATED BELOW

Description	1964 Net Tons	1964 Delivered Value	1965 Net Tons	1965 Delivered Value	1966 Net Tons	1966 Delivered Value	1967 Net Tons	1967 Delivered Value
Petroleum Coke								
Power Stations	-	-	56,118	$ 350,739	128,239	$ 788,668	97,126	$ 709,022
	Gals.		Gals.		Gals.		Gals.	
Fuel Oil								
Power Stations	5,306,248	$ 384,703	2,188,813	$ 169,633	3,463,807	$ 251,126	4,149,600	$ 300,846
Blast Furnaces	-	-	-	-	4,216,469	305,694	3,390,059	245,779
	MCF		MCF		MCF		MCF	
Natural Gas								
Power Stations	5,036,993	$1,820,873	3,583,989	$1,254,396	5,288,242	$1,903,767	5,560,337	$1,898,299

DEFENDANT'S EXHIBIT 73

Vulcan Materials Company

MIDWEST DIVISION / 29 N. WACKER DRIVE • CHICAGO, ILLINOIS 60606 • TELEPHONE FR 2-6400

W. JOE SHAW
PRESIDENT

November 28, 1966

Mr. John Cusack, Attorney
U. S. Department of Justice
Anti-Trust Division
219 South Dearborn Street
Chicago 4, Illinois

Dear Mr. Cusack:

Following our recent telephone conversation, I talked to various persons in this office about the question that you raised as to whether or not the acquisition of United Electric Coal Company by General Dynamics would in any way affect our sources of coal.

I do not believe we have ever purchased coal from United Electric Coal Company, and I believe that you pointed out in our conversation that United Electric Coal Company supplied coal primarily to the utilities industry.

We have purchased coal from a number of companies in the Midwest, and we do not believe that the acquisition of United Electric Coal Company by General Dynamics would have any effect on our future purchases of coal.

I hope this answers your recent inquiry.

Yours very truly,

W. J. Shaw

WJS:s

60-0-37
DEPARTMENT OF JUSTICE
NOV 29 1966
DIVISION OF RECORDS
Cusack

74

RIVER CEMENT COMPANY
1030 BRENTWOOD BLVD. • ST. LOUIS, MO. 63105 • PHONE: VOLUNTEER 3-9900

Direct Reply to:

9900 Clayton Road
St. Louis, Missouri 63124

September 11, 1968

Mr. Edwin M. Zimmerman
Assistant Attorney General
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Re: United States v. General Dynamics Corporation, et al., Civil Action No. 67 C 1632 (N.D. Illinois)

Dear Mr. Zimmerman:

This is in response to your letter of August 5, 1968, requesting information of our company in connection with the above case.

The questions and answers are as follows:

1.A. Total tons and dollar value of annual coal purchases from all firms supplying your Festus, Missouri plant in each of the years 1964 through 1967.

No coal was purchased for our Festus (Selma) Missouri plant during the years 1964 through 1967.

B. Please state the purpose for which coal is required and generally describe the equipment in which coal is consumed.

Coal is not required in the operation of the plant. Kiln No. 1 of the plant, presently in operation, is not equipped to burn coal. Kiln No. 2, which is under construction, will be equipped to burn coal when necessary or desirable. If and when coal is consumed, it would be consumed for firing a rotary clinker producing kiln (Kiln No. 2) in the production of portland cement, said kiln to be 17-1/2' x 16' x 560' in size.

60-0-[illegible]
DEPARTMENT OF JUSTICE
SEP 13 1968
DIVISION OF RECORDS

2.A. Please state whether your Festus, Missouri plant consumes any other energy fuel for the purpose for which coal is required.

See answer to question 1.B. Both natural gas and No. 6 oil are used at the plant for firing Kiln No. 1. Kiln No. 2 will use natural gas and coal.

B. If so, state for each such fuel the annual dollar and quantity (barrels of oil, cubic feet of gas, etc.) or equivalent coal ton purchases for the years 1964 through 1967.

	No. 6 Fuel Oil		Natural Gas	
	Gallons	$	MCF	$
1964	-0-	-0-	-0-	-0-
1965	2,711,125	191,942	1,392,786	375,634
1966	303,776	21,524	2,773,905	748,351
1967	1,267,863	132,650	2,773,124	780,439

C. Also, please generally describe the equipment in which each fuel is consumed.

Kiln No. 1, being a rotary kiln 17-1/2' x 16' x 560' in size.

3.A. If consumption of other energy fuels is in addition to coal consumption, please state the reason(s) why the plant involved does not exclusively utilize one energy fuel.

Consumption of other energy fuels is not in addition to coal consumption since there has been no coal consumption to date. However, the plant is equipped to utilize more than one fuel to assure continuous operation of the plant, in case one or more of the possible fuels is not available or becomes non-competitive in cost.

Mr. Edwin M. Zimmerman
Department of Justice
Chicago, Illinois

B. If consumption of other energy fuels substitutes for consumption of coal, please indicate the criteria used to determine when it is appropriate to switch from one energy fuel to another.

Other energy fuels will not be substituted for coal; on the contrary, coal may be substituted for other fuels on Kiln No. 2. Cost and availability would be the primary criteria for determining when it is appropriate to switch from one energy fuel to another. However, various other factors would no doubt be involved which cannot be determined in advance. Such factors might include cleanliness, fuel handling problems, etc.

4. Please furnish to us copies of any charts, memoranda, surveys or other documents which would substantiate or more fully explain the information requested above or which bear on the advantages, disadvantages, or uniqueness of any of the energy fuel sources. Please include any studies or estimates as to the feasibility of immediately converting from coal to any other energy fuel source.

None available.

5.A. Please state whether or not a ceiling is placed on the sulfur content or the coal purchased, and if so, state the maximum tolerable sulfur content and the present sulfur content of coal consumed.

Should coal be purchased in the future, we anticipate that we would specify a maximum tolerable sulfur content of about 3.5% on a dry basis.

B. Also state whether or not these tolerances may be adjusted to compensate for low-sulfur or high-sulfur raw materials used in the manufacture of cement.

Not presently determinable.

Very truly yours,

RIVER CEMENT COMPANY

Cleon L. Burt
General Attorney

CLB:bjs

DEFENDANT'S EXHIBIT 75

MISSOURI PORTLAND CEMENT COMPANY
7751 CARONDELET AVENUE
ST. LOUIS, MISSOURI 63105

WILLIAM J. BRANHAM, JR.
VICE PRESIDENT, SECRETARY

January 24, 1969

Mr. John T. Cusack
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)

In reply to your letter of January 22 regarding the above matter, I shall further clarify my letter of January 20 regarding gas purchases at the St. Louis and Joppa plants.

Gas consumed at these plants in the years indicated was primarily used in conjunction with coal for technical reasons. In general, the rates for this gas would be considered firm rather than interruptible. I am not familiar with the exact meaning of the term "seasonal" in your letter. With respect to the St. Louis plant, it would be significant to know that gas is now used as the predominant fuel as it is now less expensive than coal at this point.

Very truly yours,

WJB:ba

DEPARTMENT OF JUSTICE
JAN 27 1969
DIVISION OF

DEFENDANT'S EXHIBIT 76

LAW OFFICES

NORMAN, ENGELHARDT, ZIMMERMAN, FRANKE & LAURITZEN

69 WEST WASHINGTON STREET

CHICAGO 60602

TELEPHONE 236-0802

CABLE-ESSON CHICAGO
FOR LONG DISTANCE
DIAL 312-236-0802

HAROLD W. NORMAN
WILLIAM R. ENGELHARDT
AUSTIN W. ZIMMERMAN
ALLYN J. FRANKE
CHRISTIAN W. LAURITZEN II
GEORGE H. REDDING, JR.
RALPH MILLER
DONALD S. PETERSEN
JOHN C. WOULFE
WILLIAM K. BLANCHARD
ELLIOTT COHEN
WILLIAM P. O'KEEFE, JR.
ROGER H. FROSS

December 23, 1966

Mr. Bertram M. Long
Assistant Chief, Midwest Office
Antitrust Division
United States Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Dear Mr. Long:

In accordance with our telephone conversation, attached is a compilation showing the amount of coal in dollars and in tons purchased by Marquette Cement Manufacturing Company during the years 1964 and 1965 for its cement plants at DesMoines, Iowa; Cape Girardeau, Missouri and Oglesby, Illinois.

Due to the location of United Electric Coal Company and its ability to furnish coal on barges, Marquette, since at least 1938, has obtained its coal for the Oglesby plant under long-term contracts negotiated with United Electric Coal Company.

Similarly, because of its location, United Electric Coal Company has not been able and has not endeavored to supply coal to the Cape Girardeau or Des Moines plants.

In view of the factual circumstances, Marquette cannot see that there would be any effect upon it if the United Electric Coal Company is eliminated as an independent supplier of coal.

I am informed that Marquette has not had any arrangements or understandings with General Dynamics Corporation or any subsidiary thereof to purchase coal from General Dynamics Corporation or any subsidiary thereof on condition or

DEPARTMENT OF JUSTICE
DEC 27 1966
DIVISION OF RECORDS

consideration that General Dynamics or any subsidiary thereof purchase cement from Marquette.

I trust the foregoing gives you the information you desire.

Very truly yours,

William R. Engelhardt

WRE:ddb
Enc.

605

COAL PURCHASES - 1964 and 1965

PLANT	1964 Tons	1964 Dollar Value	1965 Tons	1965 Dollar Value
Des Moines Supplier				
Beard Coal Company	846.80	3,133.19	1,152.20	4,263.00
Consumers Consolidated Co.	696.40	2,541.89	-	-
Freeman Coal Company	16,354.00	64,761.84	29,355.76	117,423.04
University Avenue Coal Co.	8,044.30	29,255.00	1,253.25	4,586.89
Old Ben Coal Company	-	-	2,540.65	10,162.60
Peabody Coal Company	-	-	6,312.75	28,634.76
Cape Girardeau Supplier				
Freeman Coal Company	150,379.45	618.664.22	167,624.75	707,309.59
Republic Coal Company	45,035,10	154,159.19	25,960.90	86,940.73
Oglesby Supplier				
United Electric Coal Company	300,324.45	1,225,984.47	278,496.25	1,173,193.30

DEFENDANT'S EXHIBIT 77

Central Illinois Light Company

General Offices Peoria, Ill. 61602

October 21, 1966

Mr. Bertram M. Long
Assistant Chief, Midwest Office
Antitrust Division
United States Department of Justice
Room 2634, United States Courthouse
Chicago, Illinois 60604

Dear Mr. Long:

Referring to your letter of October 14, 1966 addressed to Mr. Herbert A. Blair of our Company, File No. 60-0-37, we are enclosing a list of suppliers of coal for the years 1964 and 1965, the quantity each of these suppliers furnished, and the payments made to each supplier.

No coal received by the Central Illinois Light Company in the years 1964 and 1965 was mined outside of the State of Illinois.

United Electric Coal Company and Freeman Coal Mining Corporation have both bid on supplying coal to our Company; however, we have not considered these two firms to be competitors inasmuch as Freeman supplied our Springfield Station and United Electric supplied our Peoria plants.

To answer question No. 5,

> "What effect, if any, may there be on your firm and on other public utilities if The United Electric Coal Companies is eliminated as an independent supplier of coal"

would be highly speculative in connection with the effect on other public utilities; however, we feel the elimination of United Electric Coal Company, as an independent supplier, would have little or no effect upon the Central Illinois Light Company inasmuch as we have a long term contract which runs to a period when, in our opinion, the reserves in the mine that now supplies us, will be exhausted.

60-0-37
DEPARTMENT OF JUSTICE
OCT 24 1966
DIVISION OF RECORDS

Very truly yours,

Q. W. Wellington
Senior Vice President, Operations

QWW:afb
cc: Herbert A. Blair

MISSOURI PORTLAND CEMENT COMPANY
7751 CARONDELET AVENUE
ST. LOUIS, MISSOURI 63105

WILLIAM J. BRAHMAN, JR.
VICE PRESIDENT, SECRETARY

DEFENDANT'S EXHIBIT 78

September 22, 1969

Mr. Hugo S. Sims, III
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Re: United States vs. General Dynamics Corporation, et al

Dear Mr. Sims:

In response to your recent telephone inquiry regarding the above matter, I will attempt to clarify the basis for useage of coal and gas at our three midwestern cement manufacturing plants. This data will supplement that previously requested and supplied in my letters of January 20, January 24, May 2, and May 21, 1969.

Kansas City Plant. Gas has been used for all purposes beginning sometime in 1964 to date. The rate is considered to be interruptible but the supply is sufficient to serve us without interruption throughout our entire production year. Production is normally discontinued for a couple of winter months for economic reasons. Gas is used because it is cheaper than coal.

St. Louis Plant. Over the years, coal and gas have been alternated as fuels for kiln operations depending upon the price of each fuel. The gas used for the years 1964 through 1967, as reported in my letter of January 20, 1969, was for heating purposes only. This gas was purchased on a non-interruptible basis. Coal was used exclusively for kiln operations because at that time it was more economical under a long-term contract. For more than a year, however, we have reverted to alternating coal and gas as fuels as gas prices have become more competitive. For the twelve months ended August 31, 1969, coal consumption amounted to $449,371 for 72,646 tons and gas consumption amounted to $554,828 for 2,173,972 MCF. This gas was supplied on an interruptible basis at a lower cost than coal. Coal was utilized only during the cold weather months when the supply of gas became uncertain.

60-1-37-(1)
DEPT. OF JUSTICE
SEP 23 1969
Grueach

Joppa Plant. To date, coal has been the cheapest fuel available at this plant since its completion in 1963. For this reason it has been used exclusively for kiln operations. Gas could and would be utilized for this purpose if it should become cheaper than coal. The gas that has been used at this plant has been for other purposes, such as heating and drying, for which it is preferable for technological reasons. This gas is supplied on a non-interruptible basis.

In summary, kiln operations at our three plants presently utilize three different types of fuel supply -- coal at Joppa, gas at Kansas City and a combination of coal and gas at St. Louis. At two of these locations, St. Louis and Kansas City, the fuels utilized have changed in the past five years due to changes in the competitive prices of coal and gas. Cost is the determining factor.

Very truly yours,

WJB:bmt

United States of America

80

Federal Trade Commission

Joseph W. Shea, Secretary of the Federal Trade Commission, and official custodian of its records, do hereby certify that attached is a full, true, and complete copy of:

Respondent Exhibit No. 184 A-F received in evidence in Federal Trade Commission Docket 8765, in the matter of Kennecott Copper Corporation.

IN WITNESS WHEREOF, I have hereunto subscribed my name and caused the seal of the Federal Trade Commission to be affixed this 16th day of July, A.D. 1969, at Washington, D.C.

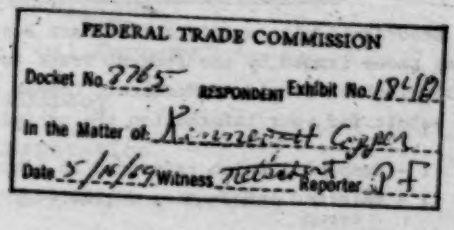
Joseph W. Shea,
Secretary.

F.T.C. 4-483

SELECTED INFORMATION REQUESTED IN SUBPOENA DUCES TECUM ISSUED BY FEDERAL TRADE COMMISSION UNDER DATE OF DECEMBER 31, 1968 ON BEHALF OF KENNECOTT COPPER CORPORATION

* * * * *

MARCH 6, 1969



PRICE WATERHOUSE & CO.

PRICE WATERHOUSE & CO.

60 BROAD STREET
NEW YORK 10004

March 6, 1969

The Honorable Donald R. Moore
Hearing Examiner
Federal Trade Commission
1101 Pennsylvania Avenue
Washington, D. C.

FEDERAL TRADE COMMISSION
Docket No. 7252 Exhibit No. 1248

Dear Mr. Moore:

KENNECOTT COPPER CORPORATION

In accordance with provisions of Part B of Attachment A to subpoena duces tecum issued by the Federal Trade Commission under date of December 31, 1968 on behalf of Kennecott Copper Corporation, we have prepared and submit for your information the exhibits listed below:

Exhibit I - Companies which responded to subpoena duces tecum
II - Selected information requested in subpoena duces tecum

We have prepared Exhibit II from data furnished to us by the participating companies listed in Exhibit I. Our work was limited to receiving and compiling the data into composite form, hence we did not compare the individual company data submitted to us with the records of such companies and no audit procedures were carried out by us. Accordingly, while we are satisfied that the data have been properly summarized, we can assume no responsibility for the underlying amounts and figures.

Every possible precaution has been taken to prevent the direct or inferential identification of the data of a particular company in the composite amounts and figures.

* * * * *

Should you have any questions about our procedures in compiling the data, please let us know.

Yours very truly,

Price Waterhouse & Co.

COMPANIES WHICH RESPONDED TO SUBPOENA DUCES TECUM ISSUED BY FEDERAL TRADE COMMISSION UNDER DATE OF DECEMBER 31, 1968 ON BEHALF OF KENNECOTT COPPER CORPORATION

FEDERAL TRADE COMMISSION
Docket No. 7765 - RESPONDENTS Exhibit No. 1941C

American Oil Company

Atlantic Richfield Company

Cities Service Company

Continental Oil Company

Getty Oil Company

Gulf Oil Corporation

Humble Oil & Refining Company

Mobil Oil Corporation

Phillips Petroleum Company

Shell Oil Company

Sinclair Oil Corporation

Standard Oil Company of California

Sun Oil Company

Texaco, Inc.

Union Oil Company of California

EXHIBIT II

SELECTED INFORMATION REQUESTED IN SUBPOENA DUCES TECUM ISSUED BY FEDERAL TRADE COMMISSION UNDER DATE OF DECEMBER 31, 1968 ON BEHALF OF KENNECOTT COPPER CORPORATION

(Unaudited)

1. Of the fifteen companies (listed in Exhibit I) served with subpoena duces tecum, the five companies shown below reported holding recoverable coal reserves in 1967:

Atlantic Richfield Company
Continental Oil Company
Gulf Oil Corporation
Humble Oil & Refining Company
Sinclair Oil Corporation

2. The above five companies reported holdings of recoverable coal reserves and acres of coal lands as follows:

(a) Total recoverable coal reserves of 7.8 million tons* in 1960 and 10,188.7 million tons in 1967.

(b) Total acres of coal lands of 4,524 acres in 1960 and 2,491,079 acres in 1967.

(c) Total recoverable coal reserves in 1960 and 1967, respectively, of:

(i) Zero million tons and zero million tons in Arizona.
(ii) Zero million tons and 234.0 million tons in Colorado.
(iii) Zero million tons and zero million tons in Idaho.
(iv) Zero million tons and 106.0 million tons in Montana.
(v) Zero million tons and zero million tons in Nevada.
(vi) Zero million tons and 222.0 million tons in New Mexico.
(vii) Zero million tons and 296.5 million tons in Utah.
(viii) Zero million tons and 1,276.0 million tons in Wyoming.
(ix) Zero million tons and 2,537.2 million tons in states west of the Mississippi River.

*Throughout tons refers to short tons.

FEDERAL TRADE COMMISSION

...eal acres of coal lands in 1960 and 1967, respectively, of:

(i) Zero acres and zero acres in Arizona.
(ii) Zero acres and 41,400 acres in Colorado.
(iii) Zero acres and zero acres in Idaho.
(iv) Zero acres and 7,900 acres in Montana.
(v) Zero acres and zero acres in Nevada.
(vi) Zero acres and 46,614 acres in New Mexico.
(vii) Zero acres and 73,064 acres in Utah.
(viii) Zero acres and 367,000 acres in Wyoming.
(ix) Zero acres and 635,782 acres in states west of the Mississippi River.

3. The five companies (listed in Item 1) holding recoverable coal reserves in the United States in 1967 are grouped as follows:

(a) One company reported total recoverable coal reserves of over 5,000 million tons.

(b) Two companies reported total recoverable coal reserves each of 1,000 million to 2,750 million tons.

(c) Two companies reported total recoverable coal reserves each of under 1,000 million tons.

4. The five companies (listed in Item 1) first acquired recoverable coal reserves or coal lands as follows:

(a) One company in 1955
(b) One company in 1962
(c) One company in 1963
(d) One company in 1965
(e) One company in 1966

FEDERAL TRADE COMMISSION
Exhibit No. 7765 ... Exhibit No. 7746

5. Of the five companies (listed in Item 1), none reported holding recoverable coal reserves in Utah in 1960. Two of the five companies reported holding such reserves in 1967.

6. Of the five companies (listed in Item 1), none reported holding recoverable coal reserves in Arizona, Colorado, Idaho, Montana, Nevada, New Mexico and Wyoming in 1960. Four of the five companies reported holding, in aggregate, such reserves in Colorado, Montana, New Mexico and Wyoming in 1967; no coal reserves were reported by such companies for Arizona, Idaho and Nevada in 1967.

7. Of the five companies (listed in Item 1), none reported holding recoverable coal reserves in states west of the Mississippi River in 1960. Four of the five companies reported holding such ... reserves ... 1967

. of the fifteen companies (listed in Exhibit I), eleven reported expenditures for research, study, or development in the conversion of coal to synthetic fuels, with the following breakdown by years:

(a) Three companies in 1963
(b) Four companies in 1964
(c) Five companies in 1965
(d) Seven companies in 1966
(e) Seven companies in 1967
(f) Four companies in period 1963-1967*

*Four companies reported estimated aggregate expenditures of $291,300 for the period 1963-1967. No specific breakdown was furnished for the individual years in that period.

9. The eleven companies referred to in Item 8 reported expenditures of $14,138,748 for research, study, or development in the conversion of coal to synthetic fuels during the years 1963-1967, both inclusive, of which $6,508,473 was reported as company funds and $7,630,275 as grants from others.

FEDERAL TRADE COMMISSION
Docket No. 7116 Exhibit No. 1944

DX 81 Standard Oil Company (New Jersey)

1968 Annual Report

* * *

March 6, 1969

We are pleased to report that earnings of Standard Oil Company (New Jersey) in 1968 increased $122 million to a record $1,277 million, or $5.94 per share, up 10.8 per cent over the comparable earnings of $5.36 per share in 1967. Accounting changes, which are described in the notes to the accompanying financial statements, had the effect of reducing the earnings figures for both years.

Dividend payments to shareholders were increased for the eighth year in a row—from $3.75 per share in 1967 to $3.85 in 1968. This was the 86th consecutive year of dividend distributions.

Total revenue rose to $15,873 million, an increase of 7.7 per cent over 1967.

Production of crude oil and natural gas liquids reached a new high rate of 5,225,000 barrels a day, up 8.2 per cent over 1967, with marked increases in production in the United States, Venezuela, and Libya. Improved manufacturing facilities in all areas and expanded capacity in Europe made possible record refinery crude oil runs of 4,621,000 barrels a day. Worldwide sales of petroleum products increased 5.0 per cent to 4,881,000 barrels a day.

The production and sale of natural gas is making an increasingly significant contribution to Jersey's total revenue. In 1968 sales of natural gas increased sharply to 5,296 million cubic feet a day. Sales in the large U.S. market accounted for 80.8 per cent of the total. However, fast-growing sales in Europe more than doubled those of 1967. Jersey's 30 per cent interest in production from the Groningen field in the Netherlands, for sale in that country and for export, is expected to double again by 1970. Initial deliveries of natural gas from the fields in the North Sea, imminent shipment of liquefied natural gas from Libya to Spain and Italy, and the beginning of gas deliveries from our joint venture in Australia also attest to the growing importance of gas to the company's future results.

Jersey's performance in 1968 is attributable in large measure to the results of an aggressive investment program. Capital expenditures made in recent years have provided the capacity for significant increases in operating volumes. Con-

tinued efforts toward cost reduction and efficiency also have contributed to improved profitability. Jersey's return on average shareholders' equity increased to 13.3 per cent last year, up from 12.6 per cent the year before and the highest in more than a decade. Further improvement is expected in 1969.

In 1968 company investments in new property, plant, and equipment amounted to $1,944 million. Slightly more than half of the 1968 investments were in the United States. A further $195 million was spent and charged to income in 1968 as part of the company's worldwide exploration program which is designed to support the objectives of increasing reserves and of diversifying the company's sources of crude oil and natural gas.

Affiliates are finding and taking advantage of major opportunities for increasing earnings in the future. In addition to the growth of natural gas sales, the investment programs associated with crude oil production from the Alaskan Arctic and offshore southeastern Australia are of particular importance. The grand scale of these exciting opportunities requires a continued high level of capital expenditures—a level which the company's strong financial position makes possible to maintain.

The demand for energy throughout the world continues to increase steadily. Improvements in the standard of living in industrialized nations and greater realization of aspirations among developing countries ensure dynamic growth in the demand for energy.

In the United States, total energy requirements are estimated to increase at an average of 4 per cent a year, which means in ten years they will be almost half again as large as they are today. The demand for oil and gas, which supply three-fourths of these requirements, is anticipated to grow proportionately. Energy consumption is increasing even faster elsewhere in the free world, and oil and natural gas are expected to supply nearly all the near-term growth in these energy requirements.

Jersey affiliates will maintain their traditional leading position as suppliers of petroleum products to free world countries. Their demonstrated success in meeting the needs of growing markets in the continents of the globe promises to continue the company's growth and profit improvement in 1969 and the years ahead. Our confidence in the future is strengthened by the enthusiastic commitment of the thousands of company employees around the world. We appreciate their loyal efforts as well as the continued support of our shareholders.

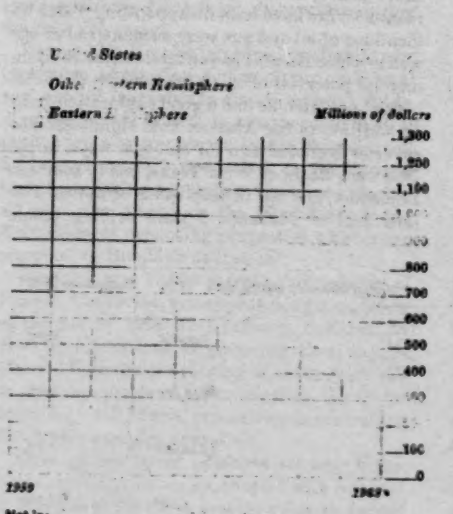
FOR THE BOARD OF DIRECTORS

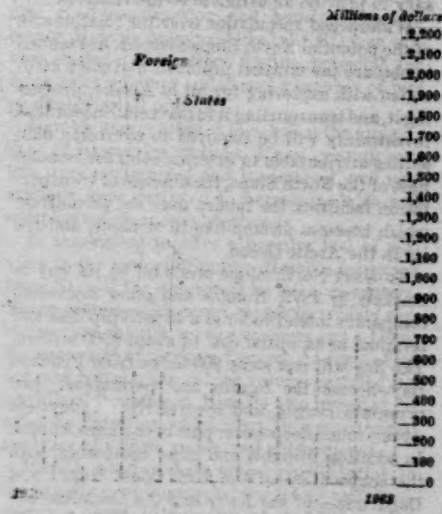
M. L. Haider, *Chairman* J. K. Jamieson, *President*

(1967 restated, see page 23)

Total revenue, *millions of dollars*	$15,273	$14,764*
Net income, *millions of dollars*	$ 1,277	$ 1,155*
Cash dividends paid, *millions of dollars*	$ 735	$ 743
Shareholders' equity, *millions of dollars*	$ 9,856	$ 9,375
Net income *per share*	$ 5.94	$ 5.36*
Cash dividends *per share*	$ 3.65	$ 3.48
Shareholders' equity *per share*	$ 45.73	$ 43.57
Net income to average shareholders' equity, *per cent*	13.3	12.6*
Net income to total revenue, *per cent*	8.0	7.8*

*Excludes estimated recoveries of $40 million or $0.18 a share on claims for World War II losses.





United States The vigorous growth of the United States economy accelerated the demand for energy during 1968. Humble Oil & Refining Company continued to contribute significantly to Jersey's results and to be a leader in the domestic petroleum industry.

The year's highlight was the discovery of oil and gas on the North Slope of Alaska by a joint venture composed of Humble and Atlantic Richfield Company. One successful well was drilled at Prudhoe Bay and another at Sag River, seven miles away. In this North Slope area, Humble has a 50 per cent interest in approximately 800,000 acres. Evaluation drilling and seismic work are continuing. The discovery appears to be very significant, but further drilling is necessary to provide an estimate of the reserves.

Widespread speculation over the relative size of the potential North Slope reserves has tended to obscure the unusual problems and costs associated with exploring for oil in Alaska, producing it, and transporting it to markets. Substantial investments will be required to overcome difficulties attributable to extreme cold, the remoteness of the North Slope, the absence of transportation facilities, the tundra over the permafrost which becomes swamp-like in summer, and the ice in the Arctic Ocean.

To start North Slope crude oil on its way to markets by 1972, Humble and other interested companies intend to build a 48-inch pipeline and terminal at an initial cost of about $900 million. The line will run some 800 miles from Prudhoe Bay—across the tundra and permafrost, two mountain ranges, and several river valleys—to a year-round deep-water port in southern Alaska. In addition, Humble and other companies, with the cooperation of the U.S. Coast Guard and Department of the Navy and the Canadian Department of Transport, plan to test the feasibility and economics of carrying oil through the Arctic Ocean, between Canada's Arctic islands, and into the North Atlantic. This icy route, known as the Northwest Passage, will be tested later in 1969 by a chartered tanker which will have an exceptionally strong hull, an icebreaker bow, and special equipment to protect propeller and rudder.

Humble and other companies invested substantial sums in 1968 to acquire leases from the federal government off the coasts of California and Texas. Offshore California, in the Santa Barbara Channel, three discovery wells have been announced, in one of which Humble has an interest. Humble also had encouraging results at other locations nearby. Further work will be required to define the magnitude of reserves. Offshore Texas, in the Gulf of Mexico, exploration results so far have been disappointing. Some indications of oil and gas were encountered at one well in which Humble has an interest, but the commercial potential of this area remains doubtful.

Onshore Humble had a good exploration year. In addition to the Alaskan find, significant discoveries included two oil and gas wells in the Delaware Basin of West Texas, one in southern Louisiana, and one in deep sands of the old Pollard field of Alabama. Future drilling should

United States operating data	1968	Change from 1967
	948,000	7.0%
	943,000	3.4%
	1,518,000	2.2%
	4,230	13.8%

Production of crude oil and natural gas liquids, barrels a day		4,892,000	4,459,000	
Other crude oil offtake under special arrangements		333,000	372,000	
	Total	5,225,000	4,831,000	8.2%
Refinery runs, barrels a day		4,621,000	4,437,000	4.1%
Petroleum product sales, barrels a day		4,891,000	4,647,000	5.0%
Natural gas sales, million cubic feet a day		5,295	4,419	19.8%
Chemical revenue, millions of dollars		933	815	14.4%
Tankers, deadweight tons capacity	Affiliate owned	6,082,000	5,415,000	
	Period chartered	7,788,000	7,384,000	
	Total	13,870,000	12,799,000	8.4%
Pipelines, barrels a day throughput		6,500,000	5,980,000	8.7%

provide sufficient information for substantial reserve additions from these discoveries during the next few years.

During 1968 Humble improved profitability by increasing production and applying additional cost control measures in its oil and gas fields. A computerized system to measure and control production was introduced in the Friendswood field near Houston to test techniques for automation of producing properties. Continued emphasis also was placed on the identification and disposition of producing properties which were marginal to Humble's operations.

Humble's new 72,000-barrel-a-day refinery at Benicia, California, was approaching completion at the end of 1968. This refinery, designed by Esso Research and Engineering Company, is planned for intensive refining of heavy crude oils to give high yields of motor gasoline. Computer technology will be used extensively in controlling this highly complex operation.

Sales of petroleum products set new highs. New operating efficiencies, coupled with relatively firm prices for these greater volumes, helped to offset rising costs for goods and services.

Taking advantage of opportunities offered by new road construction and housing developments, Humble inaugurated about 500 new service stations in locations having potential for large sales volumes and closed a number of less profitable retail outlets.

Humble also continued to enhance the appearance of its service stations. Many existing outlets were modernized and landscaped, and new stations were designed to harmonize with and complement their neighborhoods.

In innovating to offer a broader line of services to the motoring public, Humble increased from 30 to 47 the number of its car care centers. These centers offer more complete vehicle servicing than regular service stations and a Humble guarantee of work performed. At some of its car care centers, where high volume justified the additional investment, Humble also installed diagnostic facilities which provide computerized analyses of vehicle safety and performance.

Humble continued its active participation in the rapidly growing market for jet aircraft fuel, deriving about 10 per cent of its 1968 market sales volume from this product. Humble and

other affiliates combined increased by about 16 per cent their 1968 worldwide commercial jet fuel sales. Investments were made in refining, transportation, and storage facilities in the United States and abroad to enable affiliates to keep pace with the growth of the airlines' passenger and cargo fleets. The first of the new jumbo jet aircraft will use Esso fuels in New York and key European cities late this year.

Humble revenues benefited from significant growth in sales of both natural gas and liquefied petroleum gas. Sales of natural gas, already at high levels, grew by 14 per cent, owing primarily to deliveries under long-term contracts made in previous years. Sales of natural gas plant liquids were up 18 per cent, mostly as a result of increased petrochemical feedstock sales. Over a three-year period and at a cost of $80 million, Humble built 13 new gas plants and expanded 14 existing ones in Texas and Louisiana to remove additional liquids from natural gas to supply this rapidly growing business.

Humble also broadened activities in two other forms of energy: coal and uranium.

In early 1969 a Humble subsidiary, The Carter Oil Company, which holds large bituminous coal reserves in Illinois and the Rocky Mountain area, signed a long-term sales contract with Commonwealth Edison Company of Chicago. The contract calls for delivery of about three million tons of coal annually. Work was begun to develop an underground mine at Carlinville, Illinois, to supply the coal to the utility company.

In evaluating its uranium holdings, Humble determined that a deposit in Live Oak County, Texas, contained more than five million pounds of recoverable uranium oxide, and a contract is being negotiated with a nonaffiliated company for the commercial development of this ore body.

Canada Imperial Oil Limited accelerated its program for the exploration and evaluation of its strong land position covering about 10 million acres in the Mackenzie River Delta of the Canadian Arctic, 300 miles to the east of the Alaska North Slope discovery. Three seismic parties are at work in the region, and the company is drilling one exploratory well on wholly owned acreage, while a second well is being drilled on acreage in which Imperial has a one-third interest. Imperial also continued to develop production in established oil fields in the Rainbow-Zama area of northern Alberta and to explore other areas of Canada, principally in the West.

Imperial, the leading oil marketer in Canada, continued to expand its petroleum product distribution facilities. An important part of its marketing program has been the installation of automotive service centers, which Imperial pioneered in Canada. At year-end 36 of these centers were in operation.

Canada operating data	1968	Change from 1967
	173,000	6.1%
	354,000	2.3%
	385,000	2.9%
	338	12.3%

Latin America In Venezuela, Creole Petroleum Corporation started construction of a fuel oil desulfurization plant at Amuay refinery. Lago Oil & Transport Company, Limited, which processes substantial volumes of Creole crude oil for export, will build a similar plant in Aruba, Netherlands Antilles. These plants were designed

* * *

DEFENDANT'S EXHIBIT 82

UNITED STATES DISTRICT COURT
FOR THE
DISTRICT OF NEW JERSEY

Civil Action No. 954-64

UNITED STATES OF AMERICA, PLAINTIFF

v.

STANDARD OIL COMPANY (NEW JERSEY) and
POTASH COMPANY OF AMERICA, DEFENDANTS

Before the Honorable Robert Shaw

PLAINTIFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

FRED D. TURNAGE
NICOLAUS BRUNS, JR.
RICHARD T. COLMAN

Attorneys, Department of Justice
Washington, D. C.

5. Jersey is among the nation's largest industrial corporations possessing enormous financial resources, conducting operations and making investments, world-wide. Included among its operations and investments are substantial investments in the production and sale of fertilizer products. It has grown significantly in recent years due in large measure to a policy of expending capital liberally and acquiring other firms.

5a. Jersey is a large industrial corporation with enormous financial resources, and world-wide operations and investments.

• • • •

5b. Jersey has grown significantly in recent years, due in large measure to a liberal policy of capital expenditure and the acquisition of other firms.

• • • •

5b(2). Jersey's capital expenditures, including amounts spent in searching for oil and gas reserves, have averaged more than $1 billion annually over the decade preceding 1963, and have been primarily responsible for the company's continuing growth. (GX 2).

• • • •

5d(4). Jersey Production Research Company is a wholly-owned subsidiary of Jersey which conducts research in connection with methods for determining and recovering mineral deposits, principally oil. Any non-petroleum mineral deposits which the company discovers are recorded and reported to Jersey. (Rathbone Tr. 839-41).

• • • •

5e(3). The Board Advisory Committee on Investments (BAC) provides assistance to Jersey and its affiliates in evaluating proposed investments, and also initiates studies of investment opportunities. The BAC reports directly to the Board of Directors and maintains contact with Jersey's various departments. (GX 113, Stip. of Fact No. 2, par. 1). The BAC

consists of the chief executives of practically all of Jersey's major staff groups. (Rathbone Tr. 846).

Ordinarily, a project would be presented to both the BAC and the Executive Committee, with the former being the more detailed review. However, an item budgeted at less than $5 million normally would not go to the Executive Committee. (Mangelsdorf Tr. 342-43).

1131
DEFENDANT'S EXHIBIT 83

UNITED STATES DISTRICT COURT

FOR THE

DISTRICT OF NEW JERSEY

CIVIL ACTION NO. 954-64

UNITED STATES OF AMERICA,

Plaintiff,

v.

STANDARD OIL COMPANY (NEW JERSEY) and POTASH COMPANY OF AMERICA,

Defendants.

BEFORE THE HONORABLE ROBERT SHAW

PLAINTIFF'S MEMORANDUM ACCOMPANYING PLAINTIFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

FRED D. TURNAGE

NICOLAUS EBBS, JR.

RICHARD T. COLMAN

Attorneys, Department of Justice
Washington, D. C.

UNITED STATES DISTRICT COURT

FOR THE

DISTRICT OF NEW JERSEY

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	CIVIL ACTION NO. 954-64
	)	
v.	)	
	)	
STANDARD OIL COMPANY (NEW JERSEY) and POTASH COMPANY OF AMERICA,	)	
	)	
Defendants.	)	

PLAINTIFF'S MEMORANDUM ACCOMPANYING PLAINTIFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

Simultaneously herewith the Plaintiff is filing its proposed findings of fact and conclusions of law which are fully supported by record references. Rather than repeat the factual detail set forth in the proposed findings or set forth again the many references to, and quotations from, the defendants' own documents as was done in Plaintiff's pretrial brief, this memorandum summarizes the plaintiff's factual contentions and relates them to the legislative purpose underlying Section 7 of the Clayton Act and to recent Supreme Court decisions.

Summary of the Case

Pending the outcome of this litigation, Jersey has been enjoined from consummating its contract to acquire PCA's assets. Consummation of the

contract was originally scheduled for October 21, 1964 and would have achieved Jersey's goal of producing and marketing potash. Jersey's interest in the potash business began in about 1960 when it first became interested in becoming a major fertilizer producer. This was consistent with its continuous desire to put its tremendous financial resources to work by making and selling profitable new products to both new markets and to existing markets in which it was then so successfully selling petroleum and related products.

Jersey's production of its by-product natural gas, from which ammonia is made, led it to manufacture anhydrous ammonia for fertilizer use. In turn, this led it into the manufacture and sale of a full line of fertilizers derived from phosphate and potash. Soon it had extensive fertilizer facilities in Central South America and in other foreign countries. In addition, it was actively exploring the possibilities of entry into the fertilizer business in the United States. To supply its huge actual and potential raw material requirements, it sought to develop and acquire potash and phosphate reserves. With this objective, through its Canadian subsidiary, Jersey had already spent between two and three million dollars and proposed to spend an additional one and one-half million dollars, to conduct the exploration and test drilling essential for the ultimate production of potash.

In a nutshell, the Government's case rests on its contention that because Jersey was so motivated to mine and market potash and because it had the resources to satisfy this desire, it would probably have entered into the production and marketing of potash in competition with PCA and

other United States potash producers by internal expansion or by other means had it not made a contract to acquire PCA. Accordingly, the acquisition, if not permanently enjoined, will eliminate Jersey as a potential competitor to PCA and the other United States potash producers. It will also immediately foreclose such other producers from the opportunity of supplying Jersey's subsidiaries with the enormous amounts of potash they require for their fertilizer manufacturing operations.

Argument

The Statutory Purpose of Section 7

H. Rep. 1191 (81st Congress, 1st Session) makes clear that the amendments to Section 7 of the Clayton Act were concerned with the broad problem of the high level of economic concentration in the American economy. Congress viewed with alarm the increasing power in the hands of the largest corporations and since the trend was found to be due in considerable part to the external expansion of business through mergers and acquisitions, principally by large corporations buying out small companies, Congress sought to stem the tide through the anti-merger provisions of the Clayton Act. Thus, the purpose of the 1950 amendments was "to limit future increases in the level of economic concentration resulting from corporate mergers and acquisitions." (S. Rep. 1775, 81st Congress, 2nd Session). Acquisitions beyond the reach of the Sherman Act were to be proscribed and Section 7 was intended to be an effective guard against "economically significant acquisitions."

Congress therefore, prohibited acquisitions where the effect may be substantially to lessen competition in any line of commerce in any section of the country. There was to be no requirement of actuality or certainty in the injury to competition because anticompetitive consequences were intended to be arrested in their incipiency before they developed.

The legislative history shows particular Congressional concern with acquisitions by large corporations and a broad plan of preserving a free enterprise system of decentralized, independent units. The Supreme Court has expressly recognized that in deciding the legality of a merger it must weigh heavily this economic way of life which Congress was trying to preserve and that mergers which offended it were to be blocked. Brown Shoe Co. v. United States, 370 U.S. 294, 333 (1962). Thus, the size of the acquiring company has uniformly been considered a most important and decisive factor in evaluating acquisitions.

The Supreme Court has applied this philosophy in a number of instances to strike down mergers and acquisitions involving large firms or where the competition which might eventually be lessened was solely potential in character. For instance, in United States v. Aluminum Company of America, 377 U.S. 271 (1964), the Supreme Court held that the acquisition of the Rome Cable Corp. by Alcoa violated Section 7 by eliminating actual competition between them in the sale of aluminum wire and cable. Already the leading producer in the field, acquisition by Alcoa of Rome would add but 1.3% to its market share. But "[P]reservation of Rome, rather than its absorption by one of the giants, will keep it 'as an important competitive

factor' . . ." the Court said (at p. 281). In United States v. El Paso Natural Gas Co., 376 U.S. 651 (1964), Pacific Northwest Gas Co. had been unsuccessful in efforts to sell natural gas in California, could not get the gas needed to set up a project and was unable to satisfy the regulatory agencies as to its ability, but yet the Supreme Court held that it was a substantial potential competitor because of its efforts and its interest in the business and the attractiveness of the market. The entry of new firms in a booming market demonstrated the opportunities which were in fact available. On this basis, the Court found the acquisition of Pacific Northwest by El Paso to be in violation of Section 7. Similarly, in United States v. Penn-Olin Chemical Co., (378 U.S. 158 (1964)), the Supreme Court noted that the relevant business was expanding and both Penn-salt and Olin Mathieson were strongly motivated to enter the market independently. Thus, the Court held that their formation of a joint venture to do so eliminated potential competition between them including the potential competition afforded by a firm which may have merely remained a threat to enter at some indefinite future time.

Thus, Section 7 proscribes acquisitions eliminating the threat of eventual competition as well as those eliminating a substantial factor in actual competition. This is particularly so, as indicated above, when the acquisition is being made by a very large corporation.

The Elimination of Potential Competition Between Jersey and PCA.

Here, Jersey, the largest industrial corporation in the world in terms of assets held, has a record of intensive interest and activity looking to the development of its own potash production and manifestly cogent motivation for doing so. The attractive profit opportunities in this growing field, its complementary relationship to fertilizer activities in which Jersey was already becoming an increasingly important world-wide factor, Jersey's need to carry a full line of fertilizer materials for marketing purposes and need for a raw material position to achieve participation in the most profitable part of the business, are all factors which will continue to move Jersey in this direction even if this acquisition is barred. Jersey's desire for captive potash to supply its fertilizer plants cannot justify its elimination by acquisition of one of the leading competitors it would otherwise face in the production and marketing of potash.

Jersey has the means and motive to enter the business of producing and selling potash on a substantial scale without acquiring a large potash producer. Under the cases, no more need be shown to bar this acquisition. But the fact is that Jersey was actively engaging in activities calculated to bring about an entry into the business through self-development. 1/

1/ The Government does not contend that Jersey's efforts to integrate or diversify are unlawful. On the contrary, such efforts increase competition and add to the national resources. But the Government is attacking the means selected by Jersey to grow, i.e. the elimination of the leading independent competitive factor.

The economics of the fertilizer industry were irrevocably drawing Jersey into a potash producing position. This is clearly demonstrated by the company's own documents. Once in the fertilizer business Jersey soon learned it could maximize fertilizer profits by producing potash instead of buying it. It learned that carrying a full line was most desirable from a competitive marketing viewpoint. It found that the potash industry offered great growth possibilities and that potash was a product with vast sales potential which was in no danger of competition from other products. Jersey examined potash sources which could supply its own requirements and took out permits in the area of the richest known potash beds in the world. It pursued a detailed solution mining experiment and conducted an extensive number of studies, surveys of competition and market analyses. Solution mining was, however, temporarily shelved, in part to permit evaluation of the results of solution mining by others but mostly because a larger sized conventional mine would make possible greater profits. But since large scale production could be more easily sold if Jersey had a partner to share the burden, Jersey found acquisition of PCA to have benefits over and above those which would be secured after taking the trouble to develop its own business. Moreover, Jersey found that it would require a delay of four to five years before it could begin producing on its own and by that time it have have to face the competition of several other new entrants as well as the competition of the few established suppliers presently in the business. Acquisition of PCA nicely eliminated this delay and gave Jersey a jump on the other potential producers, and gave it an experienced sales organization and a

market over and above its own growing needs for potash. Use of its checkbook instead of hard, honest work in the market place was a simple way for Jersey to obtain a commanding position in potash overnight.

Jersey was so motivated to become a potash producer that it would have used its checkbook to continue its self-development program, but for the agreement with PCA. It is not necessary to speculate where or exactly when it would have achieved its goal. It had several permits in the Canadian potash fields and may have found it feasible on further exploration to construct a conventional mine or at least revert to the solution mining technique which is now in use by Kalium Chemicals to mine potash in Canada. Two of Jersey's permits were readily adaptable to this method of extraction.

In short, Jersey now seeks to justify its entry into the potash business by acquisition instead of by self-development because the economics are more attractive, marketing problems are dissolved and it can thereby secure a position immediately. The Supreme Court has expressly held that such business reasons do not authorize an acquisition otherwise unlawful. 2/ Indeed, if such reasons permit a firm like Jersey, with all its vast resources, ingenuity, experience and capabilities, to take the easy road then Section 7 can really do nothing to stop the elimination of independent firms from our economy and the concentration of economic power in the hands of the few. Section 7 clearly was intended by Congress, and has been so construed by the Supreme Court, to forbid by acquisition and merger the elimination of competition which would otherwise probably have existed, such as that between

---

2/ United States v. Philadelphia National Bank et al, 374 U.S. 321, 370-371 (1963).

Jersey and PCA.

Vertical Foreclosure Resulting from the Acquisition, If Consummated.

This acquisition also violates Section 7 in that it deprives rivals of PCA from the opportunity of supplying the substantial market represented by the potash needs of Jersey's fertilizer plants. The primary vice of a vertical merger or other arrangement tying a customer to a supplier is that by foreclosing the competitors of either party from a segment of the market otherwise open to them, the arrangement may act as a clog on competition which deprives rivals of a fair opportunity to compete. (Brown Shoe Co. v. United States, supra, at 324). Relying upon the testimony of Brown's President that Brown intended to supply shoes to Kinney, the Court found the results of the acquisition of Kinney by Brown to be analogous to a tying clause and observed that "such an arrangement is inherently anticompetitive" and "can rarely be harmonized with the strictures of the antitrust laws." Thus, the Court said, competition may be substantially lessened "although only a relatively small amount of commerce is affected."

In Brown Shoe the market represented by Kinney's shoe purchases aggregated 1.2% of national shoe sales and the foreclosure at the time of the trial of the action was one-tenth of one percent of the market but the Court passed over this fact with perfunctory consideration and held that since Brown was one of the leading manufacturers of shoes and Kinney, the largest independent chain of family shoe stores, no merger between a producer and independent retailer in the shoe industry could involve a larger potential

market foreclosure. In International Salt Co. v. United States, 332 U.S. 392 (1947), the volume of sales foreclosed by the tie-in clause totalled only about $500,000 and the arrangement was held illegal because this amount of commerce was not insubstantial. Other cases under Section 7 where the vertical foreclosure from an acquisition or merger involved relatively small amounts of commerce but were held to violate the Clayton Act were, for example, United States v. du Pont de Nemours, 353 U.S. 586 (1957), in which du Pont's sales to General Motors comprised but 1.6% of the total market for the type of fabric used by the automobile industry. Because General Motors accounted for almost half of the auto industry's sales its requirements for automotive fabrics must have been substantial, the Court said, and since du Pont was GM's largest supplier, du Pont's ownership of 23% of GM stock resulted in a substantial lessening of competition. In United States v. Bethlehem Steel Corp. et al.,(168 F. Supp. 576 (S.D.N.Y. 1958)), the Court held that Youngstown, a purchaser of wire rope, would probably become a captive market for Bethlehem. In holding that the market represented by Youngstown was substantial and its acquisition by Bethlehem would substantially lessen competition, the Court noted that the foreclosure would involve 1.3% of the entire market or 2,585 tons.

In the instant case, PCA is the leading producer of potash in the United States and the second largest in North America. Although other firms have indicated that they propose to become producers (by 1970 or thereabouts), there are but nine companies presently operating mines in the United States and PCA makes 17% of the total potash deliveries in this country. Jersey,

whose contemporaneous documents reflect the intention of obtaining a captive source of supply and whose Board Chairman (as well as the President of the Jersey subsidiary responsible for obtaining potash for Jersey's fertilizer operations) testified that Jersey fully planned to use PCA after the acquisition as a captive supply source, is a substantial purchaser of potash with requirements in excess of those of the largest customers of PCA or Southwest Potash and greater than the production capacity of three of the nine producers. Thus, like Brown Shoe and du Pont, there really could be no vertical foreclosure in this industry of more significance than Jersey's contemplated acquisition of PCA.

To the extent removal of Jersey as an available customer, as a result of acquiring PCA, forecloses suppliers of shipments from United States mines other than PCA, there is a foreclosure of competition in the production and sale of potash in this country.

Nature of the Evidence

The evidence of Jersey's potential competition, its substantial position and its large purchases of potash are contained primarily in documents obtained from the defendants and offered into evidence by the plaintiff. The defendants have stipulated that these documents are authentic and genuine. Those documents which were preserved in the defendants' files were, almost without exception, prepared concurrently with the events they purport to portray, and reflect the intent, acts and policies of the Jersey complex. The inferences fairly drawn from such material have far more reliability than self-serving declarations and reflective testimony which are intended to try to explain

away the history of the past several years. Such is the character of the evidence principally relied upon by the defendants and even that fails in its purpose. For its principal witnesses, the Chairman of Jersey's Board of Directors and the Chairman of the Esso Chemical subsidiary, both testified that Jersey would continue to look for sources of potash to develop if the acquisition of PCA is blocked by this Court and both stated under oath that PCA was to become a captive source of supply thus precluding other suppliers from participating in the market represented by Jersey's purchases. Thus, their testimony in effect corroborates the inferences flowing from the documentary evidence which plaintiff contends demonstrates that the acquisition of PCA by Jersey would result in a violation of the law.

The weight to be accorded documentary evidence of a contemporaneous nature compared to trial exculpations has been noted by the Supreme Court. For example, in United States v. U. S. Gypsum Co., 333 U.S. 364, 396 (1948), a Sherman Act case, the Supreme Court indicated that in the face of contemporaneous documents establishing a prima facie case testimony at trial conflicting with the inferences to be drawn therefrom is entitled to little consideration. In United States v. Penn-Olin, supra, the Supreme Court again rejected subjective evidence by corporate officials of the defendants disclaiming their potential competitiveness. The Court relied instead on the probabilities suggested by the objective evidence.

CONCLUSION

The Government submits that the acquisition of PCA by Jersey would violate Section 7 of the Clayton Act, as amended.

Respectfully,

FRED D. TURNAGE

NICOLAUS BRUNS, JR.

RICHARD T. COLMAN

Attorneys, Department of Justice
Washington, D. C.

Dated: April 5, 1965

84

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

EASTERN DIVISION

- X

UNITED STATES OF AMERICA, :

Plaintiff, : Civil No. 67 C 1621

-against- : FINAL JUDGMENT

PEABODY COAL COMPANY, et al., :

Defendants. :

- X

Plaintiff, United States of America, having filed its complaint herein on Sept. 21, 1967, and plaintiff and defendants, by their respective attorneys, having consented to the entry of this Final Judgment without trial or adjudication of any issue of fact or law herein, and without this Final Judgment constituting any evidence or admission by either party hereto with respect to any such issue;

Now, therefore, without any testimony having been taken, without trial or adjudication of or finding on any issue of fact or law, and on consent of the parties hereto, it is hereby

Ordered, adjudged and decreed:

I.

This Court has jurisdiction of the subject matter of this action and of the parties hereto. The complaint states claims upon which relief may be granted under Section 7 of the Clayton Act, 15 U.S.C. § 18.

II.

As used in this Final Judgment:

A. "Peabody" means the defendant Peabody Coal Company, an Illinois corporation, and any other person owned or controlled by defendant Peabody or owned or controlled by any person owning 50% or more of the voting stock of defendant Peabody;

B. "Stock" means capital stock and any other share capital;

C. "Person" means any individual, partnership, corporation, association or other business or legal entity;

D. "Eastern Interior Coal Province" means the bituminous coal field which underlies approximately 67% of the State of Illinois and a substantial portion of southwestern Indiana and western Kentucky;

E. "Eastern Interior Coal Province Sales Area" means the area of the State of Illinois, western Indiana, western Kentucky, western Tennessee, eastern Missouri, eastern Iowa, southwestern and central Wisconsin, and southeastern Minnesota;

F. "Operating Coal Company" means any person operating one or more bituminous coal mines, or selling any bituminous coal, in the eastern interior coal province sales area;

G. "Coal Reserves" means fee ownership of, or leasehold interest in, or rights to mine under royalty arrangements, or options or contracts to acquire, strip or underground bituminous coal reserves located in the eastern interior coal province sales area.

III.

The provisions of this Final Judgment applicable to any defendant shall also be applicable to each of its officers, directors, agents, and employees and to each of its subsidiaries, successors and assigns, and to all other persons in active concert or participation with any of them who receive actual notice of this Final Judgment by personal service or otherwise.

IV.

A. After two years from the date of entry of this Final Judgment, defendant Peabody is enjoined and restrained from having as an officer or director any person who is at the same time an officer or director of Southwestern Illinois Coal Corporation, an Indiana corporation.

B. Defendant Peabody is enjoined and restrained from having as an officer or director any person who is at the same time an officer or director of any other operating coal company. This provision shall not apply to separately organized joint ventures to which defendant Peabody is a party.

V.

Defendant Peabody is enjoined and restrained for a period of ten years from acquiring, except upon prior approval of the plaintiff, (a) any part of the stock of, or any financial or managerial interest in, any operating coal company, or (b) any coal mine located in the eastern interior coal province sales area.

VI.

Defendant Peabody is hereby enjoined and restrained for a period of five years from the date of entry of this Final Judgment from acquiring in any year commencing on said date or the first four anniversaries thereof, more than five million tons of coal reserves from any other operating coal company or companies except upon prior approval of the plaintiff. The swapping or exchange of coal reserves for coal reserves, without any other payment or consideration, shall be disregarded for purposes of this provision.

VII.

A. Defendant Peabody is ordered and directed, within six months after the entry of this Final Judgment, to organize a separate, viable operating coal business (with adequate strip and/or underground coal mine or mines and coal reserves in the eastern interior coal province, mining and processing machinery and equipment and all facilities used in connection therewith, and managerial, supervisory, technical and other personnel and customer accounts) either as a subsidiary corporation or as a separate division of defendant Peabody, and defendant Peabody is further ordered and directed within two years after the date of entry of this Final Judgment to divest itself, absolutely and in good faith, of said coal business and any financial or managerial interest therein, by one of the following methods:

a. Sale thereof as a viable operating business to a purchaser or purchasers approved by the plaintiff, or

b. Sale of all of the stock thereof by one or more sales to the public through an underwriter or underwriters.

B. The operating coal business required to be established and divested by defendant Peabody under Paragraph A hereof shall, at the time of such divestiture, actually be engaged in the production and sale of bituminous coal at the rate of not less than six million tons per annum, and shall have sufficient assets and earning power, and shall have or shall reasonably be expected to be able to obtain sufficient coal reserves for continued production and sale of bituminous coal at said rate of not less than six million tons per year for twenty years.

C. Plaintiff, prior to the final divestiture of said coal business as provided for in the foregoing Paragraph A, shall have opportunity to approve or disapprove of the assets thereof and, in the event of disagreement with defendant Peabody with respect thereto, plaintiff may petition the Court to determine the matter and enter such order as the Court may deem appropriate to insure fulfillment of the above requirements.

VIII.

A. Defendant Peabody shall make known the availability of said coal business for sale by ordinary and usual means for a sale of a business. Defendant Peabody shall furnish bona fide prospective purchasers all necessary information, including pro forma statements, regarding the same and the operation thereof and shall permit them to make such inspections as may be necessary for the above purpose.

B. Defendant Peabody shall not acquire any long-term debt obligation or stock of, or any equity interest in, the purchaser or purchasers of said coal business except on such terms as may be approved by the plaintiff.

C. At the election of the purchaser or purchasers and with the prior approval of the plaintiff, defendant Peabody may lease, rather than sell or transfer absolutely, the coal reserves to be included in the assets of said coal business.

D. Without the prior approval of the plaintiff, none of the stock of said coal business shall knowingly be disposed of to any person who is an officer, director or executive employee of defendant Peabody, any person in which defendant Peabody owns any material amount of stock or other material financial interest or any person beneficially owning or having unrestricted discretionary power to vote common stock of Peabody in excess of two percent of the shares outstanding, except for an institutional investor acting on behalf of its own members, depositors or shareholders or an underwriter or dealer acting as such.

IX.

For the purpose of determining or securing compliance with this Final Judgment and subject to any legally recognized privilege, duly authorized representatives of the Department of Justice shall, upon written request of the Attorney General or the Assistant Attorney General in charge of the Antitrust Division, and on reasonable notice to defendant Peabody made to its principal office, be permitted (1) reasonable access during the office hours of Peabody to all books, ledgers, accounts, correspondence, memoranda and other records and documents in the possession, custody and control of defendant Peabody relating to any of the matters contained in this Final Judgment, and (2) subject to the

reasonable convenience of defendant Peabody, but without restraint or interference from it, to interview officers, directors, agents or employees of defendant Peabody, who may have counsel present, regarding any such matters; and, upon such request, defendant Peabody shall submit such reports in writing to the Department of Justice with respect to the matters contained in this Final Judgment as may from time to time be requested. No information obtained by the means provided in this Section IX shall be divulged by any representative of the Department of Justice to any person other than a duly authorized representative of the Executive Branch of plaintiff, except in the course of legal proceedings in which the Department of Justice is a party for the purpose of determining or securing compliance with this Final Judgment, or as otherwise required by law.

X.

Jurisdiction of this cause is retained by this Court for the purpose of enabling any party to this Final Judgment to apply to this Court at any time for such further orders and directions as may be necessary or appropriate for the modification, termination, construction or carrying out of the provisions of this Final Judgment and for the enforcement of compliance therewith and punishment of violation thereof.

United States District Judge

October 23 1967

DX 85

INTERFUEL COMPETITION AND CHANGES IN THE COAL INDUSTRY SINCE WORLD WAR II

Report and Statistics by Dr. Bruce C. Netschert

Defendants' Exhibit 85
U.S. v. General Dynamics, et al.

Report

INTERFUEL COMPETITION AND CHANGES IN THE COAL INDUSTRY SINCE WORLD WAR II

by: Dr. Bruce C. Netschert

I. INTERFUEL COMPETITION

A. In the period since World War II coal has been a decreasingly effective competitor in the following markets: railroads, home and building heating, and industrial users of fuel for heat and electricity generation. The railroad market has completely disappeared; the space heating market has declined by 80% or more; and the industrial market, although suffering a lesser decline in absolute terms, has failed to keep pace with the growth of industry. The utility market, as a consequence, is now the mainstay of coal production. These changes, in terms of the markets for all energy, are not new but are a continuation of trends that have continued throughout much of the present century.

This is demonstrated by the attached tables, which show the declines referred to and the net result: a diminished position of coal in the overall energy resource consumption pattern.

B. These national trends and patterns are paralleled in the Midwest. The utility market is predominant, but in this as well as all other markets there is strong competition from the other fuels. Gas and oil, the traditional competitors, have now been joined by nuclear fuel, which will constitute an evermore serious competitor in the coming decade. Other new competitors are pumped storage, and geothermal energy as a source for power generation.

Coal also faces competition from the other fossil fuels in the market for use by industrial and institutional consumers in heating and

self-generation of electricity. Through the technique of "total energy" or on-site generation gas is definitely a competitor and oil may be. Total energy is growing rapidly and constitutes a competitive threat to coal both directly and indirectly (through the elimination of the consumption of power generated by coal-fired central stations).

In sum, the competitive situation within the energy markets as a whole is already more fluid than it has ever been before and will become still more fluid in the future.

The foregoing is demonstrated by the attached tables.

C. Enacted or pending air pollution abatement controls will have an adverse impact on coal during the next 10-20 years due to their effect on interfuel competition and consumption patterns of coal. This stems from (a) the inability to remove inorganic sulfur from coal economically, (b) the added cost of any desulfurization, (c) the added cost of stack gas desulfurization, (d) the added cost of particulate control, (e) the relative shortage, hence higher value of low sulfur coal, and (f) the inevitable increasing stringency of air pollution regulation over the coming decades.

This will be supported by the general knowledge of the witness and reference to the testimony of other witnesses.

D. In sum, competition among coal producers cannot be considered except within the context of interfuel competition.

II. STRUCTURAL CHANGES IN THE POST-WORLD WAR II PERIOD

A. Since World War II, the following changes in the production and marketing of coal have occurred.

1. In the patterns of coal consumption and marketing

a. Coal has lost its railroad market and has seen its retail market severely curtailed.

b. The industrial market for coal has failed to keep pace with industrial growth.

c. The utility market has grown uninterruptedly and has, as a consequence, come to be the dominant coal use.

d. As a result of the above changes and of changes in the scale and technology of power generation, the major emphasis in coal marketing has increasingly emphasized large quantity, long-term contracts, and Btu content, chemical and physical characteristics.

2. In labor costs

a. As a result of aggressive union bargaining, wage costs and fringe benefits have increased markedly.

3. In mining technology

a. To offset the increased labor costs, there has been a virtual technological revolution in mining

technology, with the introduction of wholly new techniques, significant improvement in old techniques, and a substantial increase in scale.

4. In productivity

a. The effect of the technological changes has been to increase productivity (as measured in output per man-day) sufficiently to enable the average F. O. B. mine value of coal to be kept competitive and relatively stable in the face of the general inflation in wholesale prices.

5. In coal preparation procedures

a. The emphasis on Btu content and on uniform characteristics in the delivered coal due to the changes in electric utility technology and buying practices has led to both more coal preparation and more intensive preparation so as to be able to deliver a high and uniform quality product.

6. In transportation costs

a. The increased competitive pressure on coal in the utility market has led to increased pressure on the railroads to offer lower rates.

b. The increased competitive pressure on coal has also generated a major technological innovation in

---railroad transportation, namely, the unit train, which has permitted lower rates.

The foregoing is demonstrated in the attached tables.

B. The effect of the changes listed in (A) above has been to enhance the economies of scale in coal production. Indeed, the producers were forced to turn to these economies in order to remain effective competitors in the energy scene.

C. The increased scale required has, in turn, led to greatly increased capital requirements in the industry. "Mechanization" has involved the substitution of capital for labor but, as machines have become larger and mine capacity has also become larger, there have been economies in the capital requirements.

D. All of the foregoing has led to an increase in the size of mines. This is illustrated in the attached tables.

E. In the past six years, oil companies have acquired significant coal production capability through the acquisition of large coal companies. In addition, several other oil companies have acquired large holdings of coal lands and one of these companies is in the process of establishing coal production in the Midwest. This is indicated in the attached table.

The significance of these moves is that the oil industry has established itself as a major element in coal production, linking, in many instances, under common ownership, energy resources of coal, oil, gas, uranium, oil shale and tar sands.

nern

INDEX TO TABLES AND CHARTS

	Table	Chart (Figure)
U.S. Steam Coal Consumption: Electric Utility, Non-Utility and Total, 1947-1968	I	I-A, I-B
Non-Utility Consumption of Steam Coal in the United States, 1947-1968	II	II
U.S. Coal Consumption, Tonnage and Percentage Distribution by Consumer Class, 1947-1968	III	
Energy Resource Consumption in the United States, Percentage by Source, 1947-1968	IV	III
Energy Resource Consumption in the United States, Percentage by Source, 1920-1968	V	IV
Electric Utility Fossil-Fuel Consumption Pattern in the United States, 1952-1968	VI	
Electric Utility Fossil-Fuel Consumption in the United States, by Census Region, 1952-1967	VII	
Installed Conventional Thermal Generating Capacity and Per Cent of Total Represented by Facilities for Alternative Fuel Use Other Than Coal, East North Central, West North Central, and East South Central Census Regions, and Midwestern States, 1967	VIII	
U.S. Thermal Generating Capacity, Existing and Planned Additions as of December 31, 1968	IX	
Status of Nuclear Power Plants as of March 31, 1969 (AEC Press Release)	X	
Non-Utility Consumption of Coal, Gas and Fuel Oil in the Midwest States	XI	
Total Energy Installations in the Midwest States as of January, 1969	XII	

INDEX TO TABLES AND CHARTS
(CONTINUED)

	Table	Chart (Figure)
Pumped Storage Projects in the United States, Existing and Planned, as of Early 1969	XIII	
U.S. Industrial Coal Consumption Versus Production Indexes -- Cement, Steel and All Manufacturing (1957-1959 = 100)	XIV	
U.S. Electric Utility Coal Consumption Versus Utility Power Generation, 1947-1967	XV	
Hourly Earnings in Coal Production, 1947-1967	XVI	
U.S. Underground Coal Mining: Total Production, Mechanically Loaded and Mined by Continuous Mining Machines, 1947-1967	XVII	
Coal Mining Productivity by Type of Mine, 1947-1967	XVIII	
Total U.S. Coal Production, Output Per Man-Day, and Employment in Coal Production, 1947-1967	XIX	
Annual Average Value Per Ton, F.O.B. Mine, of Coal Produced in the U.S., and Wholesale Price Index, 1947-1967	XX	VIII
Average Value Per Ton, F.O.B. Mines, of Underground, Strip and Total Coal Produced in Illinois, Indiana and West Kentucky, 1947-1967 (Index Basis, 1947 = 100)	XXI	IX
Percentage of Total Coal Production Mechanically Cleaned, and Refuse as a Percentage of Raw Coal, 1947-1968	XXII	
Annual Average Value of Coal Per Ton, F.O.B. Mine, Average Railroad Revenue Per Ton, and Indicated Average Delivered Cost Per Ton, 1947-1968	XXIII	

INDEX TO TABLES AND CHARTS
(CONTINUED)

	Table	Chart (Figure)
Delivered Cost of Coal (Per Million Btu) to Electric Utilities in the East North Central, West North Central and East South Central Census Regions, 1947-1967	XXIV	
Average Railroad Revenue Per Ton of Coal Hauled Versus Operating Revenue Per Ton, All Freight, 1947-1967	XXV	
Average Annual Production Per Mine, U.S. Coal Mines, 1947-1967	XXVI	
U.S. Coal Mines Producing 500,000 Tons or More Per Year; Number of Mines, Production and Per Cent of Total Coal Production, 1947-1968	XXVII	
Oil Companies with Coal Interests	XXVIII	
Utility Mergers and Acquisitions Affecting Companies Operating in the Midwest States 1955-1969 -- Effected or Currently Pending	XXIX	
Ranking Twenty Coal Purchasing Utilities with Generating Stations in the Midwest States, 1967	XXX	
Selected Statistics on the Twenty Largest Utility Companies in the Midwest States	XXXI	
Electric Utility Coal Consumption in the Midwest States, 1967	XXXII	

TABLE I
U.S. STEAM COAL* CONSUMPTION: ELECTRIC UTILITY, NON-UTILITY AND TOTAL, 1947-1967

Year	Electric Utilities (1,000 tons) (1)	% (2)	Non-Utility (1,000 tons) (3)	% (4)	Total (1,000 tons) (1) + (3) (5)
1947	86,009	19.50%	355,082	80.50%	441,091
1948	95,620	23.17	316,983	76.82	412,603
1949	80,610	22.75	273,692	77.25	354,302
1950	88,262	25.19	262,095	74.81	350,357
1951	101,898	28.67	253,558	71.33	355,456
1952	103,309	32.17	217,834	67.83	321,143
1953	112,283	35.77	201,641	64.22	313,924
1954	115,235	41.50	162,434	58.50	277,669
1955	140,550	44.47	175,485	55.53	316,035
1956	154,983	47.40	171,962	52.59	326,945
1957	157,398	51.50	148,250	48.50	305,648
1958	152,928	52.71	137,195	47.29	290,123
1959	165,788	57.75	121,287	42.25	287,075
1960	173,882	58.07	125,532	41.92	299,414
1961	179,629	59.77	120,895	40.23	300,524
1962	190,833	60.87	122,679	39.13	313,512
1963	209,038	63.04	122,554	36.95	331,592
1964	223,032	65.15	119,327	34.86	342,359
1965	242,729	66.61	121,656	33.39	364,385
1966	264,202	67.68	126,172	32.32	390,374
1967	271,784	70.02	116,360	29.98	388,144
1968p	294,739	72.23	113,326	27.77	408,065

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
p - preliminary.

Source: 1947-1962: U.S. Bureau of Mines, Mineral Industry Surveys, Weekly Coal Report No. 2635, March 15, 1968, Table 9, p. 8.

1963-1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 60, p. 84.

FIGURE I-A

U.S. STEAM COAL CONSUMPTION: ELECTRIC UTILITY, NON-UTILITY AND TOTAL, 1947-1967

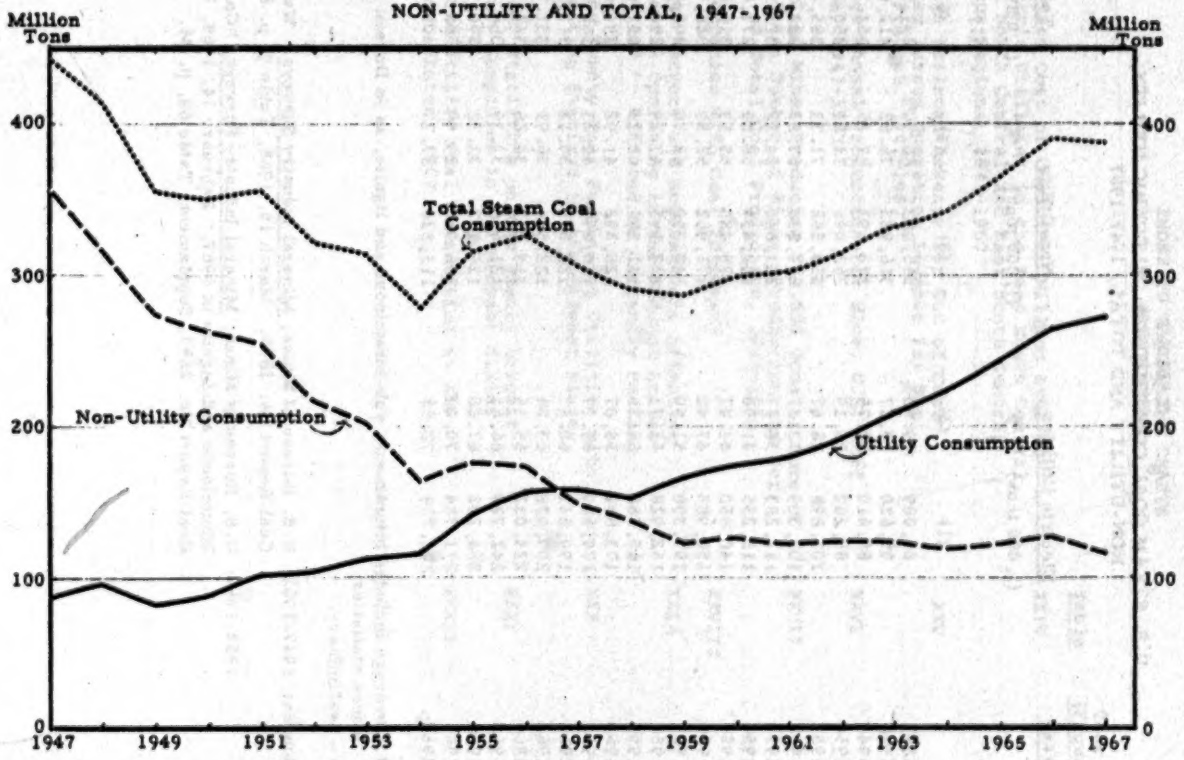


FIGURE I-B

U.S. STEAM COAL CONSUMPTION: PERCENT UTILITY AND PERCENT NON-UTILITY, 1947-1967

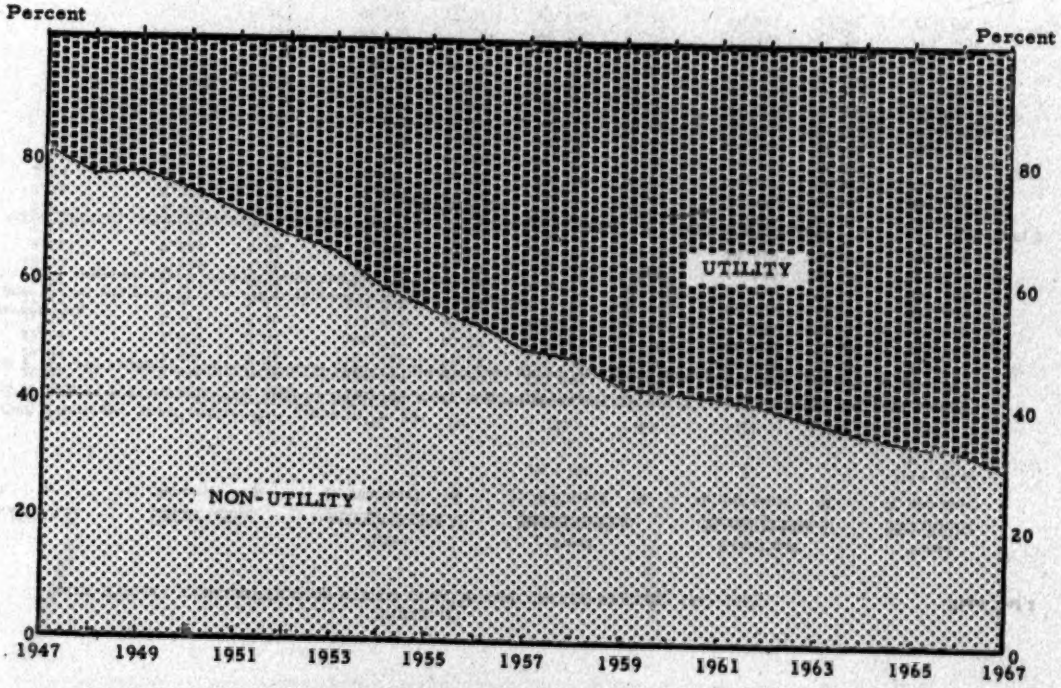


TABLE II

NON-UTILITY CONSUMPTION OF STEAM COAL IN THE UNITED STATES, 1947-1967 [a]

Year	Railroads (Class I)		Cement Mills		Other Manufacturing 1/		Total Manufacturing		Retail and Miscellaneous 2/		Total Non-Utility
	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons) (3) + (5)	%	(1,000 tons)	%	(1,000 tons) (1) + (3) + (5) + (9)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1947	109,296	30.78%	7,919	2.23%	138,123	38.90%	146,042	41.13%	99,744	28.09%	355,082
1948	94,838	29.92	8,546	2.70	124,253	39.20	132,799	41.89	89,346	28.19	316,983
1949	68,123	24.89	7,966	2.91	107,158	39.15	115,124	42.06	90,445	33.05	273,692
1950	60,969	23.26	7,923	3.02	106,739	40.73	114,662	43.75	86,464	32.99	262,095
1951	54,005	21.30	8,507	3.36	114,448	45.14	122,955	48.49	76,598	30.21	253,558
1952	37,962	17.43	7,903	3.63	103,269	47.41	111,172	51.04	68,700	31.54	217,834
1953	27,735	13.75	8,167	4.05	103,924	51.54	112,091	55.59	61,815	30.66	201,641
1954	17,370	10.69	7,924	4.88	84,098	51.77	92,022	56.65	53,042	32.65	162,434
1955	15,473	8.82	8,529	4.86	96,964	55.25	105,493	60.12	54,519	31.07	175,485
1956	12,308	7.16	9,026	5.25	100,491	58.44	109,517	63.69	50,137	29.16	171,962
1957	8,401	5.67	8,633	5.82	94,140	63.50	102,773	69.32	37,076	25.01	148,250
1958	3,725	2.72	8,256	6.02	88,640	64.61	96,896	70.63	36,574	26.66	137,195
1959	2,600	2.14	8,510	7.02	80,070	66.02	88,580	73.03	30,107	24.82	121,287
1960	2,101	1.67	8,216	6.54	83,865	66.81	92,081	73.35	31,350	24.97	125,532
1961	3/	-	7,615	6.30	84,775	70.12	92,390	76.42	28,505	23.58	120,895
1962	3/	-	7,719	6.29	86,085	70.17	93,804	76.46	28,875	23.54	122,679
1963	3/	-	8,138	6.64	90,198	73.60	98,336	80.24	24,218	19.76	122,554
1964	3/	-	8,679	7.27	90,322	75.69	99,001	82.97	20,326	17.03	119,327
1965	3/	-	8,873	7.29	93,080	76.51	101,953	83.80	19,703	16.20	121,656
1966	3/	-	9,149	7.25	96,449	76.44	105,598	83.69	20,574	16.31	126,172
1967	3/	-	8,922	7.67	89,872	77.24	98,794	84.90	17,566	15.10	116,360
1968			9,391	8.29	88,294	77.91	97,685	86.20	15,641	13.80	113,326

a Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

TABLE II

NON-UTILITY CONSUMPTION OF STEAM COAL IN THE UNITED STATES, 1947-1967 (CONTINUED)

1/ Includes steel and rolling mills and other manufacturing and mining industries.
2/ Includes bunker, lake vessel and foreign, plus retail deliveries to other consumers.
3/ Data collection discontinued.

Source: 1947-1962: U.S. Bureau of Mines, Mineral Industry Surveys, Weekly Coal Report No. 2635, March 15, 1968, Table 9, p. 8.

1963-1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 60, p. 84.

FIGURE II

NON-UTILITY CONSUMPTION OF STEAM COAL IN THE UNITED STATES, 1947-1967

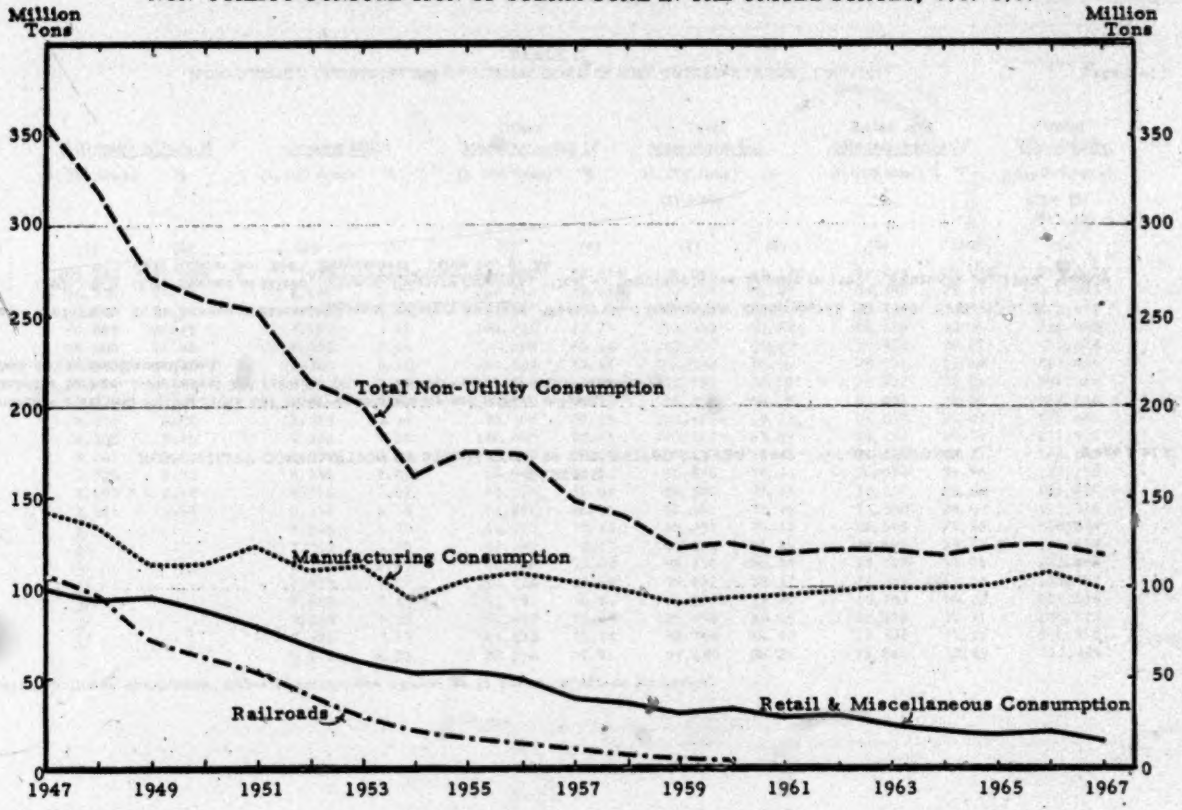


TABLE III

U.S. COAL CONSUMPTION, TONNAGE AND PERCENTAGE DISTRIBUTION BY CONSUMER CLASS, 1947-1967

Year	Electric Power Utilities		Railroads (Class I)		Coke Plants 1/		Cement Mills		Other Manufacturing 2/		Retail and Miscellaneous 3/		Total Tonnage 4/
	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons)	%	(1,000 tons)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1947	86,009	15.76%	109,296	20.02%	104,800	19.20%	7,919	1.45%	138,123	25.30%	99,744	18.27%	545,891
1948	95,620	18.39	94,838	18.24	107,306	20.64	8,546	1.64	124,253	23.90	89,346	17.18	519,909
1949	80,610	18.10	68,123	15.29	91,236	20.48	7,966	1.79	107,158	24.05	90,445	20.30	445,538
1950	88,262	19.43	60,969	13.42	103,845	22.86	7,923	1.74	106,739	23.50	86,464	19.04	454,202
1951	101,898	21.73	54,005	11.52	113,448	24.19	8,507	1.81	114,448	24.41	76,598	16.34	468,904
1952	103,309	24.67	37,962	9.07	97,614	23.31	7,903	1.89	103,269	24.66	68,700	16.41	418,757
1953	112,283	26.31	27,735	6.50	112,874	26.45	8,167	1.91	103,924	24.35	61,815	14.48	426,798
1954	115,235	31.74	17,370	4.78	85,391	23.52	7,924	2.18	84,098	23.16	53,042	14.61	363,060
1955	140,550	33.19	15,473	3.65	107,377	25.36	8,529	2.01	96,964	22.90	54,519	12.88	423,412
1957	157,398	38.05	8,401	2.03	108,020	26.11	9,026	2.09	100,491	23.22	50,137	11.58	432,858
1958	152,928	41.70	3,725	1.02	76,580	20.88	8,256	2.25	94,140	22.76	37,076	8.96	413,668
1959	165,788	45.27	2,600	0.71	79,181	21.62	8,510	2.32	88,640	24.17	36,574	9.97	366,703
1960	173,882	48.71	2,101	0.55	81,015	21.30	8,216	2.16	80,070	21.86	30,107	8.22	366,256
1961	179,629	47.98	5/	-	73,881	19.73	7,615	2.03	83,865	22.04	31,350	8.24	380,429
1962	190,833	49.21	5/	-	74,262	19.15	7,719	1.99	84,775	22.64	28,505	7.61	374,405
1963	209,038	51.08	5/	-	77,633	18.97	8,138	1.99	86,085	22.20	28,875	7.45	387,774
1964	223,032	51.73	5/	-	88,757	20.59	8,679	2.01	90,198	22.04	24,218	5.92	409,225
1965	242,729	52.86	5/	-	94,779	20.64	8,873	1.93	90,322	20.95	20,326	4.71	431,116
1966	264,202	54.33	5/	-	95,892	19.72	9,149	1.88	93,080	20.27	19,703	4.29	459,164
1967	271,784	56.57	5/	-	92,272	19.21	8,922	1.86	96,449	19.83	20,574	4.23	486,266
1968	294,739	59.09			90,765	18.20	9,391	1.88	89,872	18.71	17,566	3.66	480,416
									88,294	17.70	15,641	3.14	498,830

6 Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Includes oven and beehive coke plants.

2/ Includes steel and rolling mills and other manufacturing and mining industries.

U.S. COAL CONSUMPTION, TONNAGE AND PERCENTAGE DISTRIBUTION
BY CONSUMER CLASS, 1947-1967 (CONTINUED)

3/ Includes bunker, lake vessel, and foreign, plus retail deliveries to other consumers.
4/ Approximates total consumption.
5/ Data collection discontinued.

Source: 1947-1962: U S Bureau of Mines, Mineral Industry Surveys, Weekly Coal Report No. 2635, March 15, 1968, Table 9, p. 8.
1963-1967: U.S Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 60, p. 84.

TABLE IV

ENERGY RESOURCE CONSUMPTION IN THE UNITED STATES, PERCENTAGE BY SOURCE, 1947-1967

Year	Coal*	Anthracite	Total Coal (1) + (2)	Oil 1/	Gas 2/	Hydropower	Nuclear
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1947	43.5	3.7	47.2	32.9	15.5	4.4	-
1948	40.1	3.8	43.9	35.1	16.6	4.4	-
1949	36.9	3.0	39.9	36.3	18.8	5.0	-
1950	34.8	3.0	37.8	37.2	20.3	4.7	-
1951	33.3	2.5	35.8	37.9	22.0	4.3	-
1952	30.0	2.4	32.4	39.4	23.8	4.4	-
1953	29.7	1.9	31.6	40.0	24.3	4.1	-
1954	26.2	1.9	28.1	41.5	26.3	4.1	-
1955	27.8	1.5	29.3	40.8	26.1	3.8	-
1956	27.0	1.4	28.4	41.5	26.3	3.8	-
1957	25.8	1.3	27.1	41.4	27.8	3.7	-
1958	23.1	1.2	24.3	42.0	29.5	4.2	-
1959	22.1	1.1	23.2	42.2	30.7	3.9	-
1960	22.2	1.0	23.2	41.6	31.6	3.6	-
1961	21.5	0.9	22.4	41.6	32.3	3.6	0.1
1962	21.3	0.8	22.1	41.4	32.7	3.7	0.1
1963	21.6	0.7	22.3	40.7	33.4	3.5	0.1
1964	21.9	0.7	22.6	40.0	33.7	3.6	0.1
1965	22.4	0.6	23.0	39.7	33.4	3.8	0.1
1966	22.4	0.5	22.9	39.4	34.0	3.6	0.1
1967p	21.4	0.5	21.9	39.3	34.7	4.0	0.1
1968p	21.0	0.4	21.4	40.1	34.7	3.7	0.1

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

p - preliminary.

1/ Includes crude petroleum and imported petroleum products.

2/ Includes natural gas liquids and dry natural gas.

Source: U.S. Bureau of Mines, Minerals Yearbook, 1963, 1964, 1966 and 1967 (e.g., Table 8, p. 24, Volume I-II, 1967).

U.S. Department of the Interior, News Release, "Nation's Energy Consumption Hits New All-Time High," March 9, 1969, Table 2 and Table 5.

DCTR

FIGURE III

ENERGY RESOURCE CONSUMPTION IN THE UNITED STATES,
PERCENTAGE BY SOURCE, 1947-1967

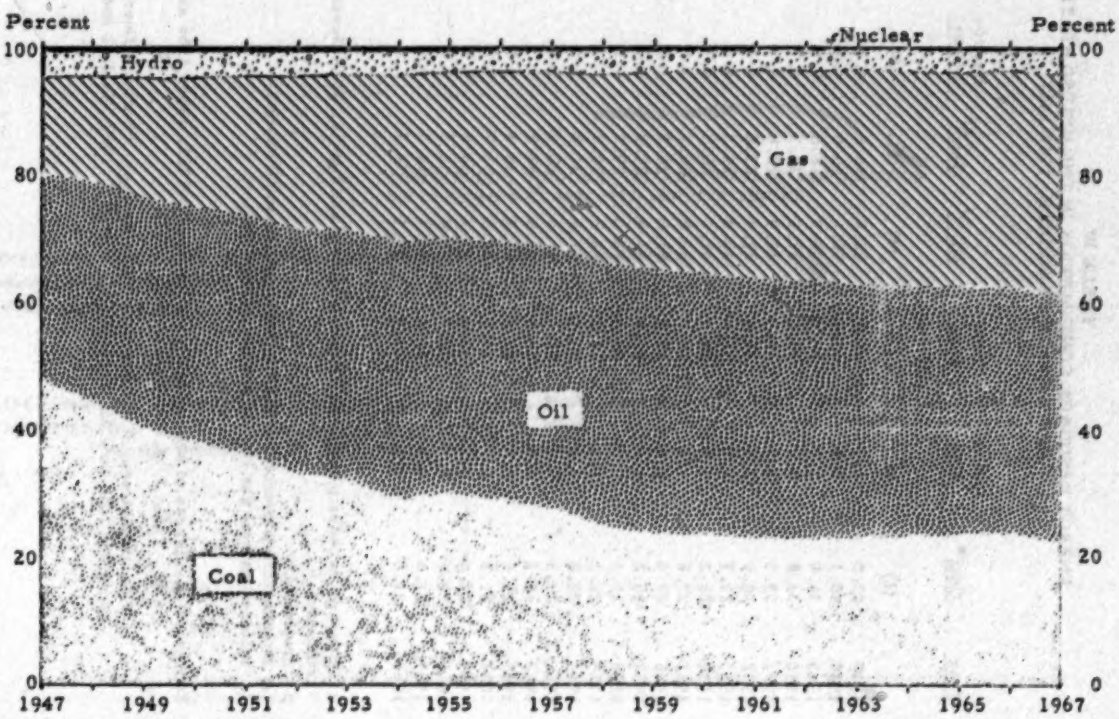


TABLE V

ENERGY RESOURCE CONSUMPTION IN THE UNITED STATES, PERCENTAGE BY SOURCE, 1920-1967

Year	Coal	Anthracite	Total Coal (1) + (2)	Oil 1/	Gas 2/	Hydro-power	Nuclear
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1920	67.4%	11.0%	78.4%	13.3%	4.4%	3.9%	- %
1921	62.6	12.7	75.3	16.3	4.4	4.0	-
1922	65.0	8.4	73.4	17.8	4.9	3.9	-
1923	62.7	10.2	72.9	18.6	5.2	3.3	-
1924	62.0	10.0	72.0	18.4	6.2	3.4	-
1925	62.6	7.8	70.4	19.9	6.4	3.3	-
1926	62.0	8.7	70.7	19.3	6.6	3.4	-
1927	60.0	8.7	68.7	20.0	7.5	3.8	-
1928	58.4	8.4	66.8	21.2	8.0	4.0	-
1929	57.3	7.6	64.9	22.3	9.2	3.6	-
1930	53.5	7.7	61.2	25.4	9.9	3.5	-
1931	51.8	7.9	59.7	26.4	10.2	3.7	-
1932	49.1	7.8	56.9	28.0	10.7	4.4	-
1933	49.2	7.5	56.7	28.6	10.4	4.3	-
1934	50.2	7.9	58.1	26.8	11.1	4.0	-
1935	48.9	6.8	55.7	28.8	11.2	4.3	-
1936	49.9	6.3	66.2	28.6	11.3	3.9	-
1937	49.6	5.6	55.2	29.1	11.7	4.0	-
1938	44.3	5.8	50.1	32.5	12.9	4.5	-
1939	45.6	5.9	51.5	31.7	12.8	4.0	-

TABLE V
ENERGY RESOURCE CONSUMPTION IN THE UNITED STATES,
PERCENTAGE BY SOURCE, 1920-1967 (CONTINUED)

Year	Coal *	Anthracite	Total Coal (1) + (2)	Oil 1/	Gas 2/	Hydro-power	Nuclear
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1940	47.2%	5.2%	52.4%	31.4%	12.4%	3.8%	- %
1941	48.4	5.0	53.4	30.8	12.1	3.7	-
1942	50.7	5.2	55.9	27.5	12.4	4.2	-
1943	51.1	4.8	55.9	27.1	12.6	4.4	-
1944	48.5	4.7	53.2	29.1	13.3	4.4	-
1945	46.5	4.2	50.7	30.5	14.1	4.7	-
1946	43.0	4.5	47.5	32.8	15.0	4.7	-
1947	43.5	3.7	47.2	32.9	15.5	4.4	-
1948	40.1	3.8	43.9	35.1	16.6	4.4	-
1949	36.9	3.0	39.9	36.3	18.8	5.0	-
1950	34.8	3.0	37.8	37.2	20.3	4.7	-
1951	33.3	2.5	35.8	37.9	22.0	4.3	-
1952	30.0	2.4	32.4	39.4	23.8	4.4	-
1953	29.7	1.9	31.6	40.0	24.3	4.1	-
1954	26.2	1.9	28.1	41.5	26.3	4.1	-
1955	27.8	1.5	29.3	40.8	26.1	3.8	-
1956	27.0	1.4	28.4	41.5	26.3	3.8	-
1957	25.8	1.3	27.1	41.4	27.8	3.7	-
1958	23.1	1.2	24.3	42.0	29.5	4.2	-
1959	22.1	1.1	23.2	42.2	30.7	3.9	-

TABLE V

ENERGY RESOURCE CONSUMPTION IN THE UNITED STATES, PERCENTAGE BY SOURCE, 1920-1967 (CONTINUED)

Year	Coal *	Anthracite	Total Coal (1) + (2)	Oil 1/	Gas 2/	Hydro-power	Nuclear
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1960	22.2%	1.0%	23.2%	41.6%	31.6%	3.6%	- %
1961	21.5	0.9	22.4	41.6	32.3	3.6	0.1
1962	21.3	0.8	22.1	41.4	32.7	3.7	0.1
1963	21.6	0.7	22.3	40.7	33.4	3.5	0.1
1964	21.9	0.7	22.6	40.0	33.7	3.6	0.1
1965	22.4	0.6	23.0	39.7	33.4	3.8	0.1
1966	22.4	0.5	22.9	39.4	34.0	3.6	0.1
1967p	21.4	0.5	21.9	39.3	34.7	4.0	0.1
1968	21.0	0.4	21.4	40.1	34.7	3.7	0.1

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
p = preliminary.

1/ Includes crude petroleum and imported petroleum products.

2/ Includes natural gas liquids and dry natural gas.

Source: 1920-1959: U.S. Bureau of Mines, Minerals Yearbook, 1960, Volume II, Table 6, pp. 9-10.

1960-1966: U.S. Bureau of Mines, Minerals Yearbook, 1964-1967, (e.g., Volume I-II, 1967, Table 8, p. 24).

1967: U.S. Department of the Interior, News Release, "Nation's Energy Consumption Hits New All-Time High," March 9, 1969, Table 2 and Table 5.

FIGURE IV

ENERGY RESOURCE CONSUMPTION IN THE UNITED STATES,
PERCENTAGE BY SOURCE, 1920-1967

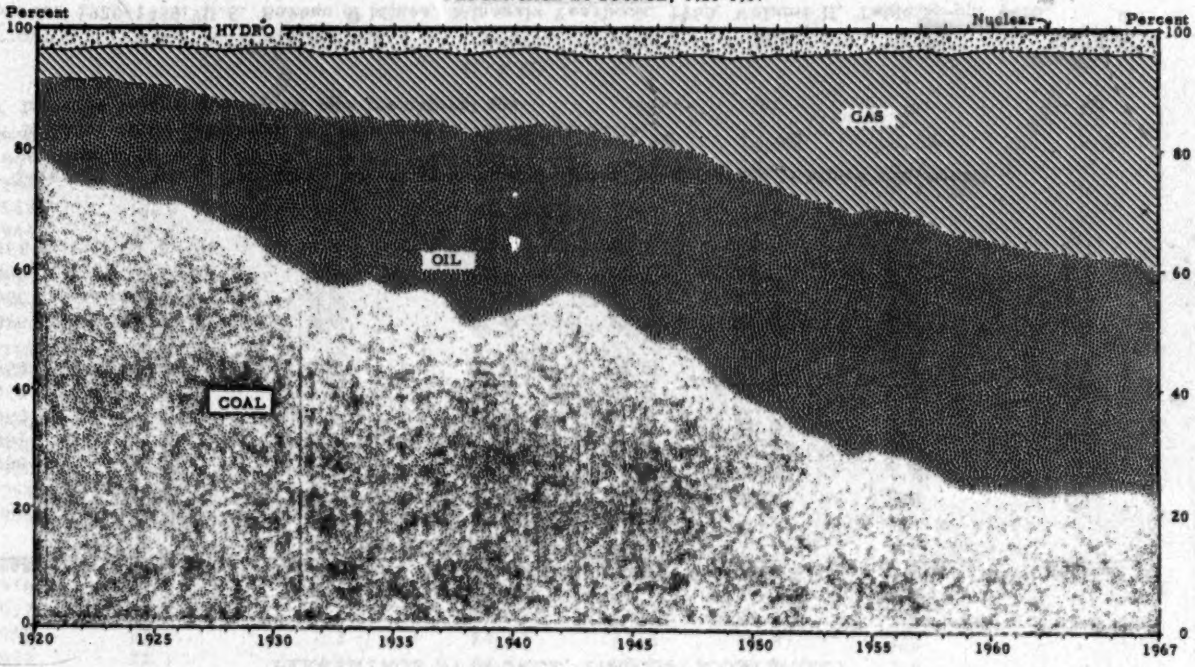


TABLE VI
ELECTRIC UTILITY FOSSIL-FUEL CONSUMPTION
PATTERN IN THE UNITED STATES, 1952-1967

Year	Per Cent of Total Btu Input		
	Coal*	Oil	Gas
	(1)	(2)	(3)
1952	67%	10%	23%
1953	66	11	23
1954	65	9	26
1955	68	9	23
1956	70	8	22
1957	69	8	23
1958	68	8	24
1959	66	8	26
1960	66	8	26
1961	65	8	27
1962	65	7	28
1963	65	7	28
1964	65	7	28
1965	66	8	26
1966	65	8	27
1967	64	9	27
1968p	62	9	28

* Coverage includes anthracite, bituminous, sub-bituminous and lignite.

p - preliminary.

Source: National Coal Association, Trends in Electric Utility Industry Experience, 1946-1958, (Washington, D. C.: National Coal Association, 1960), Table 5, p. 96.

National Coal Association, Steam-Electric Plant Factors, 1959-1968 (Washington, D. C.: National Coal Association, 1960-1968), Table 2.

nera

TABLE VII
ELECTRIC UTILITY FOSSIL-FUEL CONSUMPTION
IN THE UNITED STATES, BY CENSUS REGION, 1952-1967

Census Region and Year	Per Cent of Total Btu Input		
	Coal[b]	Oil	Gas
(1)	(2)	(3)	(4)
NEW ENGLAND			
1952	51%	49%	-%
1953	42	58	-
1954	49	48	3
1955	57	39	4
1956	65	31	4
1957	65	31	4
1958	62	33	5
1959	56	39	5
1960	58	37	5
1961	63	34	3
1962	63	33	4
1963	63	33	4
1964	63	33	4
1965	61	36	3
1966	56	42	2
1967	43	55	2
MIDDLE ATLANTIC			
1952	84	11	5
1953	80	13	7
1954	80	13	7
1955	85	10	5
1956	88	8	4
1957	85	8	7
1958	79	12	9
1959	76	14	10
1960	78	14	8
1961	78	14	8
1962	76	15	9
1963	75	15	10
1964	77	15	8
1965	77	16	7
1966	73	21	6
1967	70	23	7

nera

TABLE VII
ELECTRIC UTILITY FOSSIL-FUEL CONSUMPTION
IN THE UNITED STATES, BY CENSUS REGION, 1952-1967 (CONTINUED)

Census Region and Year	Per Cent of Total Btu Input		
	Coal [a]	Oil	Gas
(1)	(2)	(3)	(4)
EAST NORTH CENTRAL			
1952	91%	-%	9%
1953	93	-	7
1954	93	-	7
1955	95	-	5
1956	95	-	5
1957	96	-	4
1958	96	-	4
1959	95	-	5
1960	96	-	4
1961	96	-	4
1962	96	-	4
1963	96	-	4
1964	96	-	4
1965	97	-	3
1966	97	-	3
1967	96	-	4
WEST NORTH CENTRAL			
1952	47	2	51
1953	48	2	50
1954	47	2	51
1955	50	2	48
1956	48	1	51
1957	45	1	54
1958	45	-	55
1959	48	-	52
1960	47	1	52
1961	45	-	55
1962	50	-	50
1963	49	1	50
1964	50	-	50
1965	51	1	48
1966	51	-	49
1967	52	-	48

nera

TABLE VII
ELECTRIC UTILITY FOSSIL-FUEL CONSUMPTION
IN THE UNITED STATES, BY CENSUS REGION, 1952-1967 (CONTINUED)

Census Region and Year	Per Cent of Total Btu Input		
	Coal [6]	Oil	Gas
(1)	(2)	(3)	(4)
SOUTH ATLANTIC			
1952	77%	13%	10%
1953	75	14	11
1954	76	13	11
1955	78	13	9
1956	73	15	12
1957	75	15	10
1958	76	15	9
1959	77	10	13
1960	77	8	15
1961	78	9	13
1962	77	10	13
1963	79	10	11
1964	79	11	10
1965	80	12	8
1966	80	12	8
1967	80	12	8
EAST SOUTH CENTRAL			
1952	70	-	30
1953	73	-	27
1954	79	-	21
1955	87	-	13
1956	90	-	10
1957	90	-	10
1958	91	-	9
1959	91	-	9
1960	92	-	8
1961	92	-	8
1962	92	-	8
1963	92	-	8
1964	92	-	8
1965	92	-	8
1966	91	-	9
1967	89	-	11

TABLE VII
ELECTRIC UTILITY FOSSIL-FUEL CONSUMPTION
IN THE UNITED STATES, BY CENSUS REGION, 1952-1967 (CONTINUED)

Census Region and Year	Per Cent of Total Btu Input		
	Coal [6]	Oil	Gas
(1)	(2)	(3)	(4)
WEST SOUTH CENTRAL			
1952	1%	-%	99%
1953	1	-	99
1954	-	-	100
1955	-	-	100
1956	-	-	100
1957	-	-	100
1958	-	-	100
1959	-	-	100
1960	-	-	100
1961	-	-	100
1962	-	-	100
1963	-	-	100
1964	-	-	100
1965	-	-	100
1966	-	-	100
1967	-	-	100
MOUNTAIN			
1952	29	11	60
1953	27	12	61
1954	22	7	71
1955	25	6	69
1956	22	5	73
1957	19	8	73
1958	22	9	69
1959	27	9	64
1960	26	8	66
1961	30	7	63
1962	31	5	64
1963	40	4	56
1964	45	4	51
1965	49	4	47
1966	51	3	46
1967	52	3	45

TABLE VII
ELECTRIC UTILITY FOSSIL-FUEL CONSUMPTION
IN THE UNITED STATES, BY CENSUS REGION, 1952-1967 (CONTINUED)

Census Region and Year	Per Cent of Total Btu Input		
	Coal *	Oil	Gas
(1)	(2)	(3)	(4)
PACIFIC			
1952	-%	55%	45%
1953	-	52	48
1954	-	29	71
1955	-	40	60
1956	-	48	52
1957	-	46	54
1958	-	33	67
1959	-	32	68
1960	-	32	68
1961	-	27	73
1962	-	21	79
1963	-	19	81
1964	-	17	83
1965	-	19	81
1966	-	18	82
1967	-	16	84

* Coverage includes anthracite, bituminous, sub-bituminous and lignite.

Source: 1952-1958: National Coal Association, Trends in Electric Utility Industry Experience, 1946-1958 (Washington, D. C.: National Coal Association, 1960), Table 5, pp. 76-97.

1959-1967: National Coal Association, Steam-Electric Plant Factors, 1959-1968 (Washington, D. C.: National Coal Association, 1960-1968), Table 2.

TABLE VIII

INSTALLED CONVENTIONAL THERMAL GENERATING CAPACITY AND PER CENT OF TOTAL REPRESENTED BY FACILITIES FOR ALTERNATIVE FUEL USE OTHER THAN COAL, EAST NORTH CENTRAL, WEST NORTH CENTRAL, AND EAST SOUTH CENTRAL CENSUS REGIONS, AND MIDWESTERN STATES, 1967

Census Region or State	No. of Plants	Total Capacity	No. of Plants With Facilities For Burning Coal[6] and Oil or Gas	Capacity of Plants With Coal[6] and Oil or Gas Facilities	Capacity of Plants With Coal[6] and Oil or Gas Facilities as a Per Cent of Total Capacity
		(Mw)	(Mw)	(Mw)	(5) ÷ (3)
(1)	(2)	(3)	(4)	(5)	(6)
East North Central	178	47,299.0	47	12,555.6	26.55%
West North Central	184	14,122.8	99	9,384.5	66.45
East South Central	43	21,496.8	8	2,461.7	11.45
Illinois	38	13,250.8	21	8,225.7	62.08
Indiana	32	8,320.0	8	2,896.3	34.81
Wisconsin	25	4,308.7	7	576.4	13.38
Iowa	38	2,300.0	31	2,090.6	90.90
Minnesota	37	2,631.4	26	2,090.8	79.46
Missouri	36	4,034.6	20	2,802.8	69.47
Kentucky	16	5,876.6	3	1,132.2	19.27
Tennessee	6	7,203.7	1	990.0	13.74

[6] Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

Source: National Coal Association, Steam-Electric Plant Factors, 1968 Edition, (Washington, D.C.: National Coal Association, 1968), Table 1 and Table 2.

TABLE IX
U.S. THERMAL GENERATING CAPACITY, EXISTING AND PLANNED ADDITIONS AS OF DECEMBER 31, 1968
(Megawatts)

	Fossil Fueled	Nuclear	Total
			(1) + (2)
	(1)	(2)	(3)
Existing Capacity	226,293	2,817	229,110
Planned Additions to Capacity	95,558	62,267	157,825
Total	321,851	65,084	386,935
Percentages			
Of Total Existing Capacity	98.77%	1.23%	100.00%
Of Total Planned Additions to Capacity	60.55	39.45	100.00
Of Total, Existing and Planned	83.18	16.82	100.00

Source: "1969 Annual Statistical Report, Part 2," Electrical World, February 24, 1969, p. 78.

nara

No. M-84
Tel. 973-3335 or
973-3446

FOR IMMEDIATE RELEASE

NOTE TO EDITORS AND CORRESPONDENTS:

Following is a brief status report on the U. S. civilian nuclear power program:

Status of nuclear power plants, as of March 31, 1969

	Kilowatts
13 in operation	2,828,700
46 under construction	35,114,400
32 planned (reactors ordered)	27,902,300
9 planned (reactors not ordered)	8,255,000
Total	74,100,400

During the first quarter of this year there were no announcements by electric utilities of plans to build nuclear power plants or on selection of suppliers for plants previously announced.

During the first quarter of 1968, utilities made known plans for 11 nuclear power plants with a total capacity of 9,680,000 kilowatts. Reactor suppliers have been selected for 8 of these plants.

Attached for your information is a map of the United States showing the location of all present and proposed civilian nuclear power plants for which reactor suppliers have been selected.

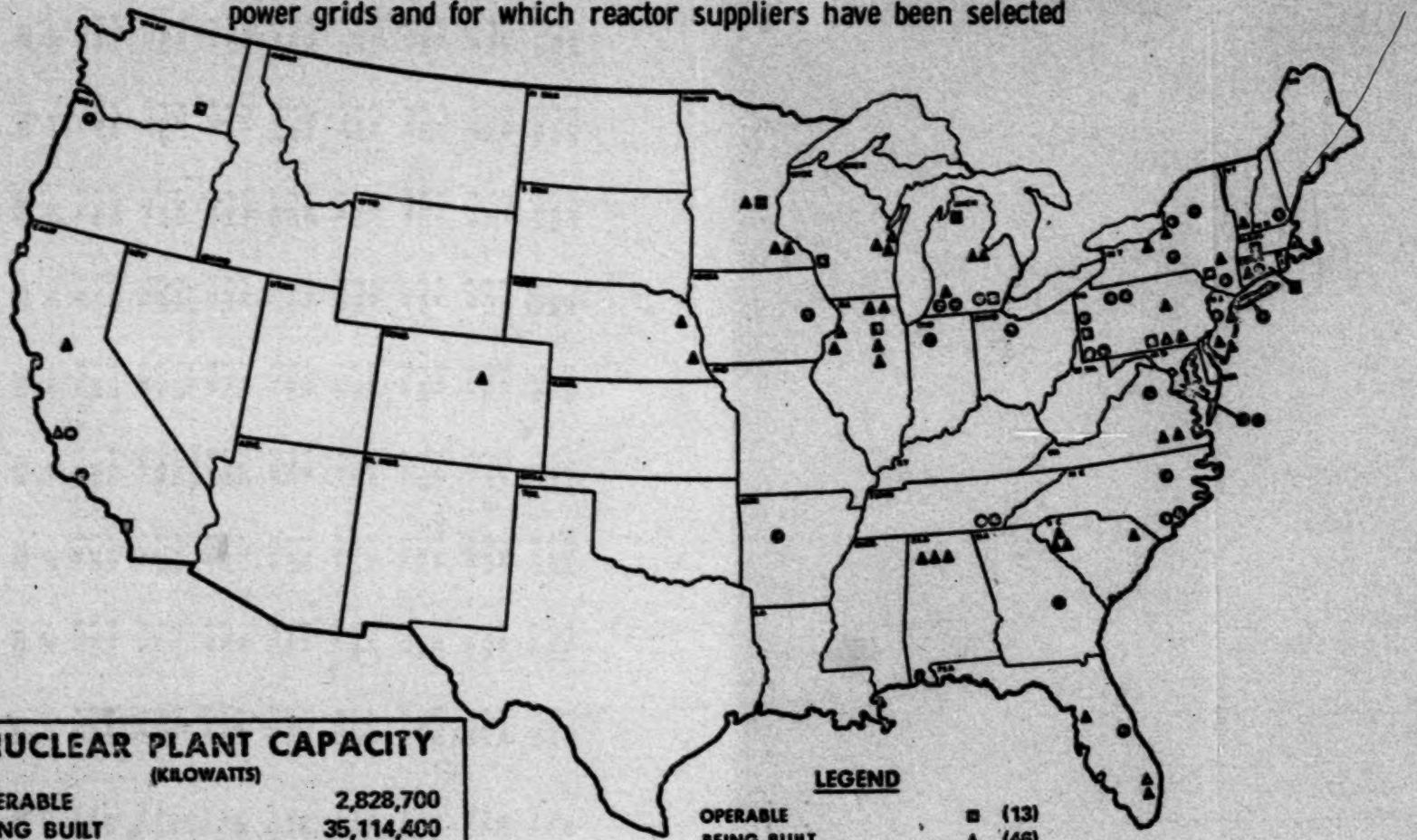
4/10/69

SITE	PLANT NAME	CAPACITY (Kilowatts)	UTILITY	STARTUP
ALABAMA				
Decatur	Browns Ferry Nuclear Power Plant: Unit 1	1,064,500	Tennessee Valley Authority	1970
Decatur	Browns Ferry Nuclear Power Plant: Unit 2	1,064,500	Tennessee Valley Authority	1971
Decatur	Browns Ferry Nuclear Power Plant: Unit 3	1,064,500	Tennessee Valley Authority	1972
ARKANSAS				
Lewisburg	Arkansas Nuclear One	850,000	Arkansas Power & Light Co.	1972
CALIFORNIA				
Humboldt Bay	Humboldt Bay Power Plant: Unit 3	68,500	Pacific Gas & Electric Co.	1963
San Clemente	San Onofre Nuclear Generating Station	430,000	Southern Calif. Edison and San Diego Gas & Electric Co.	1967
Canal Canyon	Malibu Nuclear Plant: Unit 1	462,000	L.A. Dept of Water & Power	1974
Diablo Canyon	Diablo Canyon Nuclear Power Plant: Unit 1	1,060,000	Pacific Gas & Electric Co.	1972
Diablo Canyon	Diablo Canyon Nuclear Power Plant: Unit 2	1,060,000	Pacific Gas & Electric Co.	1974
Clay Station	Rancho Seco Nuclear Generating Station	800,000	Sacramento Municipal District	1972
COLORADO				
Platteville	Ft. St. Vrain Nuclear Generating Station	330,000	Public Service Co. of Colorado	1972
CONNECTICUT				
Haddam Neck	Conn. Yankee Atomic Power Plant	567,000	Conn. Yankee Atomic Power Co.	1967
Waterford	Millstone Nuclear Power Station: Unit 1	652,100	Northeast Utilities	1969
Waterford	Millstone Nuclear Power Station: Unit 2	828,000	Northeast Utilities	1973
FLORIDA				
Turkey Point	Turkey Point Station: Unit 3	651,500	Florida Power & Light Co.	1970
Turkey Point	Turkey Point Station: Unit 4	651,500	Florida Power & Light Co.	1971
Red Level	Crystal River Plant: Unit 3	825,000	Florida Power Corp.	1972
Ft. Pierce	Hutchinson Island	825,000	Florida Power and Light Co.	1973
GEORGIA				
Baxley	Edwin I. Hatch Nuclear Plant	786,000	Georgia Power Co.	1973
ILLINOIS				
Morris	Dresden Nuclear Power Station: Unit 1	200,000	Commonwealth Edison Co.	1959
Morris	Dresden Nuclear Power Station: Unit 2	715,000	Commonwealth Edison Co.	1969
Morris	Dresden Nuclear Power Station: Unit 3	715,000	Commonwealth Edison Co.	1969
Zion	Zion Station: Unit 1	1,050,000	Commonwealth Edison Co.	1972
Zion	Zion Station: Unit 2	1,050,000	Commonwealth Edison Co.	1973
Cordova	Quad Cities Station: Unit 1	715,000	Comm. Ed. Co.--Io.--Ill. Gas & Elec. Co.	1970
Cordova	Quad Cities Station: Unit 2	715,000	Comm. Ed. Co. Io. Ill Gas & Elec. Co.	1971
INDIANA				
Dunes Acres	Bailly Generating Station	515,000	Northern Indiana Public Service Co.	1970's
IOWA				
Cedar Rapids	Duane Arnold Energy Center: Unit 1	545,000	Iowa Electric Light and Power Co.	1973
MAINE				
Wiscasset	Maine Yankee Atomic Power Plant	790,000	Maine Yankee Atomic Power Co.	1972
MARYLAND				
Lusby	Calvert Cliffs Nuclear Power Plant: Unit 1	800,000	Baltimore Gas and Electric Co.	1973
Lusby	Calvert Cliffs Nuclear Power Plant: Unit 2	800,000	Baltimore Gas and Electric Co.	1974
MASSACHUSETTS				
Rowe	Yankee Nuclear Power Station	175,000	Yankee Atomic Electric Co.	1960
Plymouth	Pilgrim Station	625,000	Boston Edison Co.	1971
MICHIGAN				
Big Rock Point	Big Rock Point Nuclear Plant	70,300	Consumers Power Co.	1962
South Haven	Palisades Nuclear Power Station	700,000	Consumers Power Co.	1965
Lagoona Beach	Enrico Fermi Atomic Power Plant: Unit 1	60,900	Detroit Edison Co.	1963
Lagoona Beach	Enrico Fermi Atomic Power Plant: Unit 2	1,128,000	Detroit Edison Co.	1974
Bridgman	Donald C. Cook Plant: Unit 1	1,054,000	Indiana & Michigan Electric Co.	1972
Bridgman	Donald C. Cook Plant: Unit 2	1,060,000	Indiana & Michigan Electric Co.	1973
Midland	Midland Nuclear Power Plant: Unit 1	533,000	Consumers Power Co.	1974
Midland	Midland Nuclear Power Plant: Unit 2	792,000	Consumers Power Co.	1975
MINNESOTA				
Elk River	Elk River Nuclear Plant	22,000	Rural Cooperative Power Assoc.	1962
Monticello	Monticello Nuclear Generating Plant	545,000	Northern States Power Co.	1970
Red Wing	Prairie Island Nuclear Generating Plant: Unit 1	530,000	Northern States Power Co.	1972
Red Wing	Prairie Island Nuclear Generating Plant: Unit 2	530,000	Northern States Power Co.	1974
NEBRASKA				
Fort Calhoun	Ft. Calhoun Station: Unit 1	457,400	Omaha Public Power District	1971
Brownville	Cooper Nuclear Station	778,000	Consumers Public Power District and Iowa Power and Light Co.	1972
NEW HAMPSHIRE				
Seabrook	Seabrook Nuclear Station	860,000	Public Service Co. of N.H.	1974
NEW JERSEY				
Toms River	Oyster Creek Nuclear Power Plant: Unit 1	515,000	Jersey Central Power & Light Co.	1969
Salem	Salem Nuclear Generating Station: Unit 1	1,050,000	Public Service Gas and Electric Co. of New Jersey	1971
Salem	Salem Nuclear Generating Station: Unit 2	1,050,000	Public Service Gas and Electric Co. of New Jersey	1973
NEW YORK				
Indian Point	Indian Point Station: Unit 1	265,000	Consolidated Edison Co.	1962
Indian Point	Indian Point Station: Unit 2	873,000	Consolidated Edison Co.	1970
Indian Point	Indian Point Station: Unit 3	965,300	Consolidated Edison Co.	1971
Scriba	Nine Mile Point Nuclear Station	500,000	Niagara Mohawk Power Co.	1969
Rochester	R.E. Ginna Nuclear Power Plant: Unit 1	420,000	Rochester Gas & Electric Co.	1969
Shoreham	Shoreham Nuclear Power Station	800,000	Long Island Lighting Co.	1975
Lansing	Ball Station	838,000	New York State Electric & Gas Co.	1973
*		1,115,000	Consolidated Edison Co.-Orange and Rockland Utilities, Inc.	1973
Scriba	Nine Mile Point Nuclear Station	815,000	Power Authority of State of N.Y.	1973
NORTH CAROLINA				
Southport	Brunswick Steam Electric Plant: Unit 1	821,000	Carolina Power and Light Co.	1973
Southport	Brunswick Steam Electric Plant: Unit 2	821,000	Carolina Power and Light Co.	1974
*		821,000	Carolina Power and Light Co.	1976
OHIO				
Oak Harbor	Davis-Besse Nuclear Power Station	872,000	Toledo Edison-Cleveland Electric Illuminating Co.	1974
OREGON				
Rainier	Trojan Station	1,114,000	Portland General Electric Co.	1974
PENNSYLVANIA				
Peach Bottom	Peach Bottom Atomic Power Station: Unit 1	40,000	Philadelphia Electric Co.	1966
Peach Bottom	Peach Bottom Atomic Power Station: Unit 2	1,065,000	Philadelphia Electric Co.	1971
Peach Bottom	Peach Bottom Atomic Power Station: Unit 3	1,065,000	Philadelphia Electric Co.	1973
*		1,065,000	Philadelphia Electric Co.	1975
*		1,065,000	Philadelphia Electric Co.	1977
Shippingport	Shippingport Atomic Power Station: Unit 1	90,000	Duquesne Light Co.	1957
Shippingport	Beaver Valley Power Station: Unit 1	847,000	Duquesne Light Co.-Ohio Edison Co.	1973
Goldsborough	Three Mile Island Nuclear Station: Unit 1	831,000	Metropolitan Edison Co.	1971
Goldsborough	Three Mile Island Nuclear Station: Unit 2	810,000	Metropolitan Edison Co.	1973
*		1,052,000	Pennsylvania Power and Light	1975
*		1,052,000	Pennsylvania Power and Light	1977
SOUTH CAROLINA				
Hartsville	H.B. Robinson S.E. Plant: Unit 2	683,000	Carolina Power & Light Co.	1970
Seneca	Oconee Nuclear Station: Unit 1	841,100	Duke Power Co.	1971
Seneca	Oconee Nuclear Station: Unit 2	841,100	Duke Power Co.	1972
Seneca	Oconee Nuclear Station: Unit 3	841,100	Duke Power Co.	1973
TENNESSEE				
Daisy	Sequoyah Nuclear Power Plant: Unit 1	1,124,000	Tennessee Valley Authority	1973
Daisy	Sequoyah Nuclear Power Plant: Unit 2	1,124,000	Tennessee Valley Authority	1973
VERMONT				
Vernon	Vermont Yankee Generating Station	513,900	Vermont Yankee Nuclear Power Corp.-Green Mt. Power Corp.	1970
VIRGINIA				
Gravel Neck	Surry Power Station: Unit 1	783,000	Virginia Electric & Power Co.	1971
Gravel Neck	Surry Power Station: Unit 2	783,000	Virginia Electric & Power Co.	1972
Louisa County	North Anna Power Station: Unit 1	845,000	Virginia Electric & Power Co.	1974
WASHINGTON				
Richland	N. Reactor/WPPSS Steam	790,000	Washington Public Power Supply System	1966
WISCONSIN				
Genoa	LaCrosse Boiling Water Reactor	50,000	Dairyland Power Cooperative	1967
Two Creeks	Point Beach Nuclear Plant: Unit 1	454,000	Wisconsin Michigan Power Co.	1970
Two Creeks	Point Beach Nuclear Plant: Unit 2	454,000	Wisconsin Michigan Power Co.	1971
Carlton	Kewaunee Nuclear Power Plant: Unit 1	527,000	Wisconsin Public Service Co.	1972

* Site not selected

NUCLEAR POWER PLANTS IN THE UNITED STATES

The nuclear power plants included in this map are ones whose power is being transmitted or is scheduled to be transmitted over utility electric power grids and for which reactor suppliers have been selected



NUCLEAR PLANT CAPACITY

(KILOWATTS)

OPERABLE		2,828,700
BEING BUILT		35,114,400
PLANNED	REACTORS ORDERED	27,902,300
	REACTORS NOT ORDERED	8,255,000
	TOTAL	74,100,400

ELECTRIC UTILITY CAPACITY BY CONVENTIONAL MEANS AS OF JANUARY 31, 1969: 291,163,554 KILOWATTS

LEGEND

OPERABLE	■	(13)
BEING BUILT	▲	(46)
*PLANNED (Reactors Ordered)	●	(32)

*9 more plants have been announced for which reactors have not yet been ordered.

U.S. Atomic Energy Commission
March 31, 1969

(over)

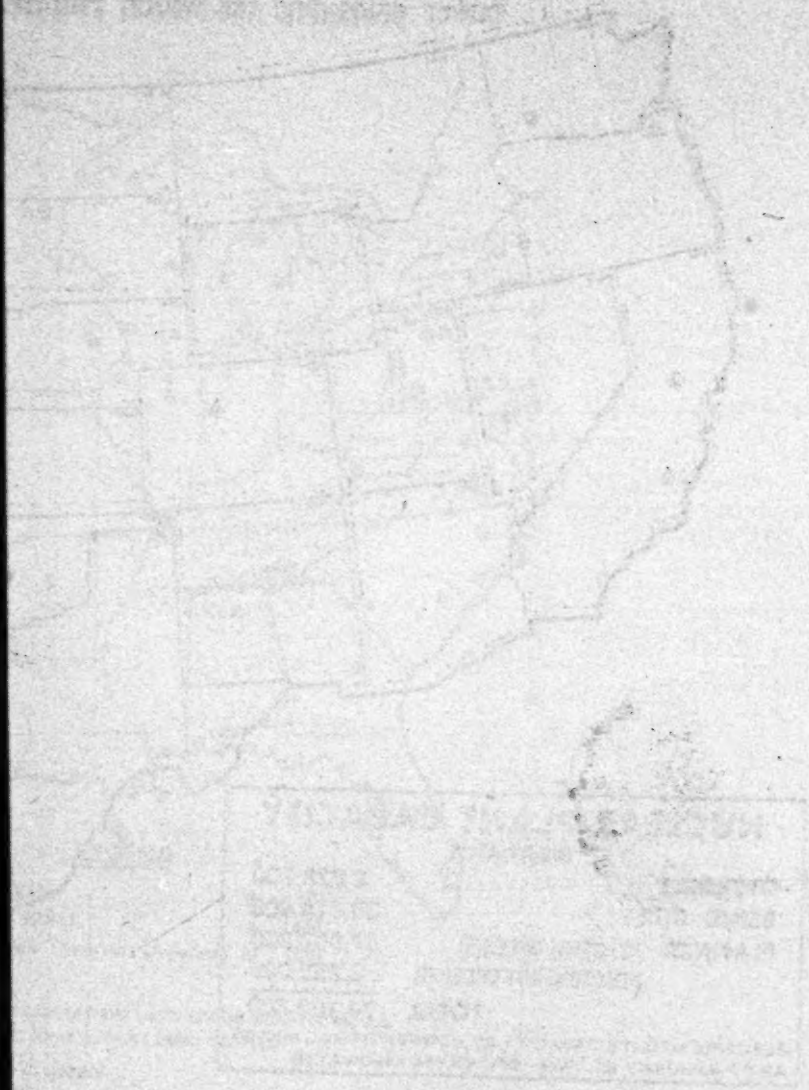


TABLE XI

NON-UTILITY CONSUMPTION* OF STEAM COAL, NATURAL GAS AND FUEL OIL IN THE MIDWEST STATES, 1957-1967, INDEX BASIS (1957 = 100)

State	Fuel	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Illinois	Coal	100.0	93.5	92.0	82.3	76.8	79.2	76.0	75.1	77.0	73.9	68.1
	Gas	100.0	110.0	122.8	133.7	146.3	156.5	165.5	184.3	200.6	220.6	249.2
	Oil	100.0	131.4	120.3	122.5	122.6	119.5	114.7	105.8	110.2	99.5	115.4
Indiana	Coal	100.0	97.2	96.7	90.3	88.8	88.9	84.7	84.0	83.9	90.8	89.8
	Gas	100.0	107.4	120.7	148.9	168.3	188.9	205.2	232.8	251.5	279.7	306.2
	Oil	100.0	111.2	115.6	124.5	116.1	114.6	114.9	118.6	120.6	113.0	111.4
Iowa	Coal	100.0	96.3	98.4	95.2	85.2	89.0	90.2	83.4	90.6	83.3	76.6
	Gas	100.0	105.7	122.0	124.7	132.8	142.4	149.4	167.5	176.8	160.5	192.1
	Oil	100.0	95.1	112.4	107.3	100.7	99.0	94.9	91.4	88.3	90.4	95.3
Kentucky	Coal	100.0	102.2	88.7	92.5	91.8	91.9	115.2	113.8	109.2	117.4	110.1
	Gas	100.0	104.6	114.3	124.6	126.6	131.7	138.2	146.1	145.1	126.9	162.0
	Oil	100.0	99.9	131.3	98.9	87.9	98.9	89.9	84.8	148.3	174.1	169.7
Minnesota	Coal	100.0	79.1	95.2	116.4	111.2	89.8	98.5	94.9	104.1	90.9	89.6
	Gas	100.0	102.0	112.8	123.9	136.6	156.6	154.1	173.5	187.3	202.3	215.9
	Oil	100.0	93.1	96.0	100.1	89.8	98.1	95.5	92.7	100.4	109.4	98.0
Missouri	Coal	100.0	91.7	91.7	87.9	77.9	75.0	65.1	65.4	63.8	59.3	56.4
	Gas	100.0	107.0	113.1	117.8	122.6	129.8	133.4	141.9	150.5	157.3	161.0
	Oil	100.0	101.0	90.9	88.2	84.5	73.0	74.3	72.4	73.3	74.8	76.5
Tennessee	Coal	100.0	62.4	55.9	56.8	55.8	54.8	59.2	57.4	62.2	64.5	65.1
	Gas	100.0	109.8	111.0	115.3	119.6	124.3	128.1	135.7	144.8	138.9	161.9
	Oil	100.0	95.0	88.7	87.4	90.0	92.2	89.5	80.5	103.9	139.2	190.4
Wisconsin	Coal	100.0	89.9	123.8	123.0	127.2	125.0	119.3	121.2	127.9	124.0	119.1
	Gas	100.0	113.4	138.1	148.9	173.2	208.9	235.3	270.4	314.6	353.2	385.5
	Oil	100.0	130.8	138.0	142.0	145.7	149.1	147.2	143.2	138.5	139.1	168.7

TABLE XI

NON-UTILITY CONSUMPTION * OF STEAM COAL, NATURAL GAS AND FUEL OIL IN THE MIDWEST STATES, 1957-1967, INDEX BASIS (1957 = 100) (CONTINUED)

* Coverage includes bituminous, sub-bituminous and lignite as in Bureau of Mines statistics.

* Shipments of coal and oil to consumers.

Source: Coal: U.S. Bureau of Mines, Minerals Yearbook, 1962 and 1967.
Gas: U.S. Bureau of Mines, Minerals Yearbook, 1957-1966.
U.S. Bureau of Mines, Mineral Industry Surveys, "Natural Gas Production and Consumption: 1967," September 17, 1968.
Oil: U.S. Bureau of Mines, Mineral Industry Surveys, "Shipments of Fuel Oil and Kerosine," 1957-1967 annual issues.

TABLE XII
TOTAL ENERGY INSTALLATIONS * IN THE MIDWEST STATES
AS OF JANUARY, 1969

	Company	Location	Year	Capacity (Kw)
	(1)	(2)	(3)	(4)
		ILLINOIS		
1.	O'Hareport Motor Hotel	Chicago	1969	2,000
2.	Caterpillar Tractor Co.	Joliet	1968	8,000
3.	Meadowmart Center	Rockford	1968	1,200
4.	Action Plating Co.	Des Plaines	1967	300
5.	American Oil Co.	Chicago	1965	525
6.	American Oil Co.	Lake Forest	1964	180
7.	Dominic Accorsi	Bartlett	1966	125
8.	Apple River Chemical	East Dubuque	1965	1,500
9.	J.H. Armbruster & Co.	Aurora	1967	120
10.	Bell & Gossett	Morton Grove	N.A.	50
11.	Bergan High School	Peoria	1964	675
12.	Blackberry Poultry Farms	Joliet	1967	200
13.	Cavanagh Foundry	Elgin	1967	300
14.	Celene, Inc.	St. Charles	1967	70
15.	Charles Equipment Co.	Elmhurst	1966	15
16.	Costa High School	Galesburg	1964	250
17.	Decatur Sewage Plant	Decatur	N.A.	325
18.	Deck's Plaza	Geneseo	1967	450
19.	Deco Porcelain	Sycamore	1965	150
20.	DeKalb Suburban Apartments	DeKalb	1965	880
21.	Dixie Square Shopping Center	Harvey	1965	975
22.	Driscoll High School	Addison	1967	500
23.	Edens Executive Center	Wilmette	1966	600
24.	Farmers Grain	Colfax	1965	375
25.	Fehrembacher Oil Co.	Olney	1966	150
26.	Grand Plating Co.	Chicago	1967	200
27.	Hintzsche Feed Mill	Troxel	1960	300
28.	Institute of Gas Technology	Chicago	1963	760
29.	Intercontinental Alloys, Inc.	Joliet	1967	190
30.	Lewis College	Lockport	1965	1,005
31.	Livingston of Chatsworth	Chatsworth	1967	125
32.	Lake Shore Plating	Wilmette	1966	115
33.	Marbon Chemical	Ottawa	1967	2,250
34.	Montini High School	Villa Park	1966	500
35.	Northern Illinois Gas Co.	Aurora	1963	1,240
36.	Northern Illinois Gas Co.	Aurora	1966	150
37.	Northern Illinois Gas Co.	Bellwood	1967	900
38.	Northern Illinois Gas Co.	Crystal Lake	1966	75
39.	Northern Illinois Gas Co.	Elgin	1964	50
40.	Northern Illinois Gas Co.	Elk Grove	1966	75
41.	Northern Illinois Gas Co.	Glen Ellyn	1962	450
42.	Northern Illinois Gas Co.	Glenwood	1965	200
43.	Northern Illinois Gas Co.	Joliet	1966	140
44.	Northern Illinois Gas Co.	LaGrange	1963	75
45.	Northern Illinois Gas Co.	LaGrange	1966	225
46.	Northern Illinois Gas Co.	Naperville	1963	75
47.	Northern Illinois Gas Co.	Palos Heights	1965	65
48.	Northern Illinois Gas Co.	Schaumberg	1964	65
49.	Northern Illinois Gas Co.	Troy Grove	1964	675
50.	Pheasant Run	St. Charles	1963	925

TABLE XII
TOTAL ENERGY INSTALLATIONS * IN THE MIDWEST STATES
AS OF JANUARY, 1969 (CONTINUED)

	Company	Location	Year	Capacity (Kw)
	(1)	(2)	(3)	(4)
		ILLINOIS (CONTINUED)		
51.	Watson Oldsmobile	Harvey	1966	25
52.	WTAS-FM	Beecher	1966	25
53.	Northern Illinois Gas Co.	Anacona	1964	150
54.	North Shore Gas Co.	Waukegan	1967	545
55.	Patten Tractor	Elmhurst	1966	900
56.	Gas Light & Coke Co.	Chicago	1966	4,300
57.	Peoples Gas Light & Coke Co.	Chicago	1965	1,000
58.	Precision Extrusion	Bensenville	1966	375
59.	Process Engineering	Crystal Lake	1967	100
60.	Pro Golf	Rosemont	1966	75
61.	Quali-Tech Machinery & Engineering	Elk Grove Village	1966	60
62.	Radiant Plating	Rosemont	1966	225
63.	Rechel Stone	Skokie	1964	225
64.	Robt. Frost Jr. High School	Markham	1966	275
65.	Sheraton O'Hare Inn	Rosemont	1966	1,400
66.	Shappert Engineering	Belvidere	1967	125
67.	Siebert & Sons	Chenoa	1962	225
68.	Siebert & Sons	Sheldon	1962	75
69.	Smith Gas Service Co.	Rockford	1965	50
70.	St. Joseph's Health Resort	Wedron	1967	240
71.	Tapecoat Mfg. Co.	Evanston	1967	210
72.	Tri-State Expressway	Auburn	1966	150
73.	Tollway North Office Center	Deerfield	1967	1,225
74.	Webtron Corp.	Chicago	1965	30
75.	Franciscan Hospital	Rock Island	1968	3,600
	TOTAL CAPACITY, ILLINOIS (KW)			46,355
		INDIANA		
1.	Union Hospital	Terre Haute	1969	2,880
2.	Cass County Jr.-Sr. High School	Walton	1967	750
3.	Culver School District	Culver	1967	650
4.	McAllister Machinery	Indianapolis	1966	350
5.	Indiana Oxygen	Indianapolis	1940	160
6.	Jefferson High School	Lafayette	1968	600
7.	Marion Brick & Tile	Brazil	1965	1,800
8.	Paoli Jr.-Sr. High School	Paoli	1967	575
9.	Union Hospital	Terre Haute	1968	1,500
10.	Whane Supply	Evansville	1966	200
11.	South Side Jr. High School	Columbus	1968	650
	TOTAL CAPACITY, INDIANA (KW)			10,115

TABLE XII
TOTAL ENERGY INSTALLATIONS * IN THE MIDWEST STATES
AS OF JANUARY, 1969 (CONTINUED)

Company	Location	Year	Capacity (Kw)
(1)	(2)	(3)	(4)
IOWA			
1. Green Products	Conrad	1965	625
2. Mercy Hospital	Council Bluffs	N.A.	1,650
3. Hansen's Market	Council Bluffs	1963	290
4. Knoxville Readymix	Knoxville	1966	300
5. Meiners Creamery	Fredericksburg	1963	350
6. Municipal Plant	Council Bluffs	N.A.	150
7. Municipal Plant	Ames	N.A.	150
8. Rockford Brick & Tile	Rockford	1963	175
9. Bourns Electric Mfg. Co.	Ames	1965	1,400
10. Champlin Truck Stop	New Hampton	1966	250
11. Farmers' Co-op	Cresco	1963	375
TOTAL CAPACITY, IOWA (KW)			5,715
KENTUCKY			
1. Jenkins Clinic Hospital	Jenkins	1964	700
2. Turfland Mall	Lexington	1967	4,200
3. Western Kentucky Gas Co.	Owensboro	1966	600
4. Sheffield's Corners	Beaver Dam	1965	150
TOTAL CAPACITY, KENTUCKY (KW)			5,650
MINNESOTA			
1. Superior Plating	Minneapolis	1966	200
2. Computer Time Sharing Corp.	Chaska	1968	250
3. Thunderbird Mall	Virginia	1968	1,700
4. Webb Publishing Co.	Minneapolis	1965	125
5. Anoka Feed & Grain Co.	Anoka	1963	150
6. Minneapolis Honeywell	Minneapolis	1966	200
7. Brady High School	St. Paul	1964	675
8. Minneapolis Gas Co.	Minneapolis	1963	100
9. Williams Hardware	Minneapolis	1965	625
10. Grace High School	Fridley	1965	650
11. Minneapolis Gas Co.	Minneapolis	1964	175
12. Minneapolis Gas Co.	Minneapolis	N.A.	125
13. Vocational High School	Detroit Lakes	1965	450
14. Municipal Plant	Richfield	N.A.	450
15. Todd County Co-op Creamery	Browerville	1962	350
16. Valley Ridge Center	Minneapolis	1963	600
17. Farmers Union Co-op	Inver Grove	1966	450
TOTAL CAPACITY, MINNESOTA (KW)			7,275

TABLE XII

TOTAL ENERGY INSTALLATIONS * IN THE MIDWEST STATES AS OF JANUARY, 1969 (CONTINUED)

Company	Location	Year	Capacity (Kw)
(1)	(2)	(3)	(4)
	MISSOURI		
1. Osteopathic Hospital	Kansas City	1969	2,300
2. Missouri State Sanitarium	Mount Vernon	1968	1,000
3. Siegel-Robert Plating Co.	St. Louis	1967	300
4. Pepsi-Cola Bottlers	New Haven	1965	250
5. Acme Plating Co.	St. Louis	1967	300
6. Downtown Ind. Park	Kansas City	1967	600
7. KFVS-TV	Cape Girardeau	1967	475
8. Mark Twain Shopping Center	St. Charles	1968	3,000
9. Laclede Gas Co.	St. Louis	1968	4,300
10. Laclede Gas Co.	St. Louis	1966	1,050
11. Council Plaza	St. Louis	1965	3,000
12. Midland Brick & Tile	Chillicothe	1964	375
13. Atlas Plastics Co.	Cape Girardeau	1965	1,350
14. Missouri Delta Hospital	Sikeston	1965	325
TOTAL CAPACITY, MISSOURI (KW)			18,625
	WISCONSIN		
1. Oscar Meyer, Inc.	Madison	1969	5,000
2. Wisconsin Southern Gas Co.	Lake Geneva	1968	200
3. Sun Village Apartments	Sun Prairie	1965	500
4. Wisconsin Gas Co.	Milwaukee	1963	2,550
5. Germantown High School	Germantown	1967	450
6. Spring Mall	Milwaukee	1967	2,400
TOTAL CAPACITY, WISCONSIN (KW)			11,100

N. A.: Not Available

* Excludes installations for which applications are listed as continuous duty/standby, municipal generating plants, or applications other than electrical generation.

Source: Total Energy, 1969 Directory and Data Book, Volume 6, No. 1, January, 1969 (San Antonio, Texas: Total Energy Publishing Co., 1969), pp. 41-51.

TABLE XIII

PUMPED STORAGE PROJECTS IN THE UNITED STATES, EXISTING AND PLANNED, AS OF EARLY 1969

System	Project	State	River	Reversible Capacity (Mw)	Year of Initial Operation
(1)	(2)	(3)	(4)	(5)	(6)
		EXISTING PROJECTS			
Appalachian Power Co.	Upper Smith Mtn.	Va.	Roanoke	132.0	1965
California Dept. of Water Resources	Oroville	Calif.	Feather	293.2	1968
California Dept. of Water Resources	Thermalito	Calif.	Feather	82.5	1968
Connecticut Light & Power Co.	Rocky River	Conn.	Rocky	7.0	1929
Grand River Dam Authority	Salina *	Okla.	Grand	520.0	1968
Jersey Central Power & Light Co. & Public Service Gas & Electric Co.	Yards Creek *	N.J.	Delaware	337.5	1964
Philadelphia Electric Co., et al.	Muddy Run *	Pa.	Susquehanna	600.0	1967
Power Authority of State of N.Y.	Niagara-Lewiston	N.Y.	Niagara	240.0	1961
Public Service Co. of Colorado	Cabin Creek *	Colo.	South Clear Creek	300.0	1967
Tennessee Valley Authority	Hiwassee	N.C.	Hiwassee	59.5	1956
Union Electric Co.	Taum Sauk *	Mo.	East Fork Black	408.0	1963
U.S. Bureau of Reclamation	Flatiron #3	Colo.	Colorado-Big Thompson	8.5	1954
U.S. Bureau of Reclamation	Senator Wash *	Calif.	Colorado	7.2	1966
U.S. Bureau of Reclamation	O'Neil *	Calif.	Delta Mendota Canal	25.2	1968
U.S. Bureau of Reclamation & California Dept. of Water Resources	San Luis *	Calif.	Cal Aqueduct	424.0	1968
		PROJECTS PLANNED, UNDER CONSTRUCTION, OR UNDER CONSIDERATION			
Appalachian Power Co.	Upper Blue Ridge	Va.	New	1,600.0	1975
Arizona Power Authority	Montezuma *	Ariz.	Gila	500.0	1972
Colorado River Water Conservation Dist.	Blair Mtn. *	Colo.	White	525.0	N.A.
Consolidated Edison Co. of N.Y.	Cornwall #1-8 *	N.Y.	Hudson	2,000.0	1975

TABLE XIII

PUMPED STORAGE PROJECTS IN THE UNITED STATES, EXISTING AND PLANNED, AS OF EARLY 1969 (CONTINUED)

System	Project	State	River	Reversible Capacity (Mw)	Year of Initial Operation
(1)	(2)	(3)	(4)	(5)	(6)
	PROJECTS PLANNED, UNDER CONSTRUCTION, OR UNDER CONSIDERATION (CONTINUED)				
Consumers Power Co.	Ludington *	Mich.	Lake Michigan	1,872.0	1973
Duke Power Co.	Jocassee	S.C.	Keowee	450.0	1974
Duke Power Co.	Jocassee #2	S.C.	Keowee	2,300.0	N.A.
Georgia Power Co.	Laurens Shoals	Ga.	Oconee	216.0	N.A.
Grand River Dam Authority	Salina #4, 5, & 6 *	Okla.	Grand	129.6	1971
Jersey Central Power & Light Co.	Longwood Valley #1, 2, & 3 *	N.J.	Rockaway	129.0	1971
Jersey Central Power & Light Co. & Public Service Electric & Gas Co.	Tocks Island *	N.J.	Delaware	950.0	N.A.
Los Angeles Dept. of Water & Power & California Dept. of Water Resources	Castaic	Calif.	Aqueduct-Castaic	1,200.0	1972
New England Power Co.	Bear Swamp	Mass.	Deerfield	600.0	1974
Northeast Utilities	Northfield #1, 2 & 3 *	Mass.	Connecticut	750.0	1971
Northeast Utilities	Northfield #4	Mass.	Connecticut	250.0	1972
Pennsylvania Electric Co. & Cleveland Electric Illuminating Co.	Kinzua **	Pa.	Allegheny	330.0	1969
Power Authority of State of N.Y.	Blenheim-Gilboa *	N.Y.	Hudson	1,000.0	1973
Public Utility Dist. #1 of Chelan Co.	Dirty Face Mnt. *	Wash.	Wenatchee	65.0	N.A.
Public Utility Dist #1 of Cowlitz Falls	Cowlitz Falls *	Wash.	Lewis	500.0	N.A.
Salt River Project	Horse Mesa	Ariz.	Salt	70.0	1971
Salt River Project	Mormon Flat	Ariz.	Salt	47.0	1971
Tennessee Valley Authority	Racoon Mnt.	Tenn.	Tennessee	1,400.0	1975
Virginia Electric & Power Co.	Marble Valley *	Va.	Calfpasture	1,000.0	1975
U.S. Army Corps of Engineers	Carters	Ga.	Coosawattee	250.0	1970

TABLE XIII

PUMPED STORAGE PROJECTS IN THE UNITED STATES, EXISTING AND PLANNED, AS OF EARLY 1969 (CONTINUED)

System	Project	State	River	Reversible Capacity (Mw)	Year of Initial Operation
(1)	(2)	(3)	(4)	(5)	(6)
PROJECTS PLANNED, UNDER CONSTRUCTION, OR UNDER CONSIDERATION (CONTINUED)					
U.S. Army Corps of Engineers	De Gray #2	Ark.	Caddo	28.0	1971
U.S. Army Corps of Engineers	Clarence Cannon	Mo.	Salt	27.0	1973
U.S. Army Corps of Engineers	Keysinger Bluff	Mo.	Osage	160.0	1973
U.S. Bureau of Reclamation	Grand Coulee PP *	Wash.	Columbia	97.0	1971

* "Pure" Pumped Storage Project: Plant which derives its energy from pumped water only.
** Also known as Seneca Project.
N.A.: Not Available.

Source: Federal Power Commission, Hydroelectric Power Resources of the United States, Developed and Undeveloped, January 1, 1968, Table 11, p. 109.

Federal Power Commission, private communication.

Edison Electric Institute, 45th Semi-Annual Electric Power Survey, April, 1969, Appendix I.

Engineering News Record, January 2, 1969, pp. 22-25.

TABLE XIV

U.S. INDUSTRIAL COAL* CONSUMPTION VERSUS PRODUCTION INDEXES -- CEMENT, STEEL AND ALL MANUFACTURING

(1957-1959 = 100)

Year	Index, Industrial Coal * Consumption 1/	Index, All Manufacturing 2/	Index, Steel Production 3/	Index, Cement Production 4/
	(1)	(2)	(3)	(4)
1947	136	66	87	58
1948	130	69	91	64
1949	112	65	80	65
1950	119	76	100	70
1951	128	82	108	76
1952	113	85	96	77
1953	122	93	115	82
1954	96	86	91	84
1955	116	97	120	95
1956	117	100	119	101
1957	115	101	116	94
1958	94	93	88	98
1959	91	106	96	107
1960	94	109	102	101
1961	90	110	101	102
1962	91	119	101	106
1963	96	125	112	111
1964	102	133	131	116
1965	107	145	135	117
1966	109	159	138	120
1967	104	160	131	116
1968	102			

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Total of consumption by "manufacturing and mining industries" as listed in source.

2/ Federal Reserve Board Index of Industrial Production, "Manufacturing, Total."

3/ Ingots and castings, all grades.

4/ All types.

TABLE XIV

U.S. INDUSTRIAL COAL CONSUMPTION VERSUS PRODUCTION INDEXES -- CEMENT, STEEL AND ALL MANUFACTURING (CONTINUED)
(1957-1959 = 100)

Source: (Cols. 1, 3, 4): Quantity data in U.S. Bureau of Mines, Minerals Yearbook, 1947-1967.

(Col. 2):

1947-1961: Board of Governors of the Federal Reserve System, Industrial Production, 1957-1959 Base, Table S-151.

1962-1965: Board of Governors of the Federal Reserve System, Division of Research and Statistics, Industrial Production Indexes, 1961-1965, November, 1966, pp. 17-21.

1966 and 1967: Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, December, 1967, p. 2129; December, 1968, p. A-57.

TABLE XV
U.S. ELECTRIC UTILITY COAL CONSUMPTION VERSUS
UTILITY POWER GENERATION, 1947-1967

Year	Utility Coal* Consumption	Utility Power Generation	Index, Coal Consumption	Index, Power Consumption
	(1,000 tons)	(Billion Kwh)	----------(1947 = 100)----------	
	(1)	(2)	(3)	(4)
1947	86,009	256	100	100
1948	95,620	283	111	111
1949	80,610	291	94	114
1950	88,262	329	103	129
1951	101,898	371	118	145
1952	103,309	399	120	156
1953	112,283	443	131	173
1954	115,235	472	134	184
1955	140,550	547	163	214
1956	154,983	601	180	235
1957	157,398	632	183	247
1958	152,928	645	178	252
1959	165,788	710	193	277
1960	173,882	753	202	294
1961	179,629	792	209	309
1962	190,833	852	222	333
1963	209,038	917	243	358
1964	223,032	984	259	384
1965	242,729	1,055	282	412
1966	264,202	1,144	307	447
1967	271,784	1,214	316	474
1968p	294,739	1,327	343	518

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
p - preliminary.

Source: (Col. 1): U.S. Bureau of Mines, Minerals Yearbook, 1947-1967.

(Col. 2): 1947-1957: U.S. Bureau of the Census, Historical Statistics of the United States, Series S-28, p. 507.

1958-1966: U.S. Bureau of the Census, Statistical Abstract of the United States, 1958-1967.

1967: Federal Power Commission, News Release, No. 16000, March 26, 1969, p. 5.

TABLE XVI
HOURLY EARNINGS IN COAL PRODUCTION, 1947-1967

Year	Hourly Earnings 1/
(1)	(2)
1947	$ 1.58
1948	1.84
1949	1.88
1950	1.94
1951	2.14
1952	2.22
1953	2.40
1954	2.40
1955	2.47
1956	2.72
1957	2.92
1958	2.93
1959	3.11
1960	3.14
1961	3.12
1962	3.12 2/
1963	3.15 2/
1964	3.30 2/
1965	3.49 2/
1966	3.66 2/
1967	3.75 2/

8 Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Production workers only.
2/ 11-month averages.

Source: U.S. Bureau of Labor Statistics, Employment and Earnings Statistics for the United States, 1909-1968, Bulletin No. 1312-6, 1968, p. 21.

TABLE XVII

U.S. UNDERGROUND COAL MINING: TOTAL PRODUCTION, MECHANICALLY LOADED AND MINED BY CONTINUOUS MINING MACHINES, 1947-1967 1/

Year	Total Underground Production	Mechanically Loaded 2/	Continuous Mining	Per Cent of Underground Coal: Mechanically Loaded 2/	Per Cent of Underground Coal: Mined by Continuous Mining Machines
	(1,000 tons)				
	(1)	(2)	(3)	(4)	(5)
1947	491,229	298,157	-	60.7%	- %
1948	460,012	295,806	450	64.3	0.1
1949	331,823	222,376	2,600	67.0	0.8
1950	392,844	272,725	4,850	69.4	1.2
1951	415,842	304,051	6,061	73.1	1.5
1952	356,425	268,994	8,215	75.6	2.3
1953	349,551	278,329	11,830	79.6	3.4
1954	289,112	242,970	16,336	84.0	5.7
1955	343,465	290,671	27,460	84.6	8.0
1956	365,774	307,402	39,907	84.0	10.9
1957	360,649	305,737	53,783	84.8	14.9
1958	286,884	243,573	56,373	84.9	19.7
1959	283,434	243,731	65,792	86.0	23.2
1960	284,888	245,786	77,928	86.3	27.4
1961	272,766	235,350	84,321	86.3	30.9
1962	281,266	240,920	90,174	85.7	32.1
1963	302,256	259,241	104,350 3/	85.8	34.5 3/
1964	321,808	281,101	124,677 3/	87.4	38.7 3/
1965	332,661	296,633	141,938 3/	89.2	42.7 3/
1966	338,524	310,281	155,053 3/	91.7	45.8 3/
1967	349,133	329,914	168,803 3/	94.5	48.3 3/
1968p	343,350	326,483	N.A.	95.0	N.A.

e Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
p - preliminary.

TABLE XVII

U.S. UNDERGROUND COAL MINING: TOTAL PRODUCTION, MECHANICALLY LOADED AND MINED BY CONTINUOUS MINING MACHINES, 1947-1967 1/
(CONTINUED)

N.A. - Not Available.

1/ Categories not mutually exclusive.
2/ Includes continuous mining.
3/ Includes longwall mining.

Source: (Col. 1, 2, 3): U.S. Bureau of Mines, Minerals Yearbook, 1948-1966, (e.g., Table 36, p. 661, 1966).
U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 38, p. 55.

TABLE XVIII

COAL* MINING PRODUCTIVITY
BY TYPE OF MINE
1947-1967

Year	Average Tons Per Man Per Day			
	Total	Underground Mines	Strip Mines	Auger Mines
	(1)	(2)	(3)	(4)
1947	6.42	5.49	15.93	1/
1948	6.26	5.31	15.28	1/
1949	6.43	5.42	15.33	1/
1950	6.77	5.75	15.66	1/
1951	7.04	6.08	16.02	1/
1952	7.47	6.37	16.77	20.07
1953	8.17	7.01	17.62	25.30
1954	9.47	7.99	19.64	24.12
1955	9.84	8.28	21.12	22.22
1956	10.28	8.62	21.18	24.85
1957	10.59	8.91	21.64	26.19
1958	11.33	9.38	21.54	28.15
1959	12.22	10.08	22.65	28.77
1960	12.83	10.64	22.93	31.36
1961	13.87	11.41	25.00	30.61
1962	14.72	11.97	26.76	34.61
1963	15.83	12.78	28.69	38.87
1964	16.84	13.74	29.29	42.63
1965	17.52	14.00	31.98	45.85
1966	18.52	14.64	33.57	44.43
1967	19.17	15.08	35.17	46.40

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Not reported separately.

Source: U.S. Bureau of Mines, Minerals Yearbook, 1965 and 1966 (e.g., Table 27, p. 648, 1966).

U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 29, p. 41.

TABLE XIX

TOTAL U.S. COAL* PRODUCTION, OUTPUT PER MAN-DAY, AND EMPLOYMENT IN COAL* PRODUCTION, 1947-1967

Year	Total Production	Index, Production	Output Per Man-Day	Index, Output	Employment 1/	Index, Employment
	(1,000 tons)	(1947 = 100)	(tons)	(1947 = 100)		(1947 = 100)
	(1)	(2)	(3)	(4)	(5)	(6)
1947	630,624	100.00	6.42	100.00	419,182	100.00
1948	599,518	95.07	6.26	97.51	441,631	105.36
1949	437,868	69.43	6.43	100.16	433,698	103.46
1950	516,311	81.87	6.77	105.45	415,582	99.14
1951	533,665	84.62	7.04	109.66	372,897	88.96
1952	466,841	74.03	7.47	116.36	335,217	79.97
1953	457,290	72.51	8.17	127.26	293,106	69.92
1954	391,706	62.11	9.47	147.51	227,397	54.25
1955	464,633	73.68	9.84	153.27	225,093	53.70
1956	500,874	79.43	10.28	160.12	228,163	54.43
1957	492,704	78.13	10.59	164.95	228,635	54.54
1958	410,446	65.09	11.33	176.48	197,402	47.09
1959	412,028	65.34	12.22	190.34	179,636	42.85
1960	415,512	65.89	12.83	199.84	169,400	40.41
1961	402,977	63.90	13.87	216.04	150,474	35.90
1962	422,149	66.94	14.72	229.28	143,822	34.31
1963	458,928	72.77	15.83	246.57	141,646	33.79
1964	486,998	77.22	16.84	262.31	128,698	30.70
1965	512,088	81.20	17.52	272.90	133,732	31.90
1966	533,881	84.66	18.52	288.47	131,752	31.43
1967	552,626	87.63	19.17	298.60	131,523	31.38
1968p	545,000	86.42	N.A.	N.A.	N.A.	N.A.

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

p - preliminary. N.A. - Not Available.

1/ Average number of men working daily.

Source: 1947-1959: U.S. Bureau of Mines, Minerals Yearbook, 1965, Volume II, Table 6, p. 51-52.

1960-1962: U.S. Bureau of Mines, Minerals Yearbook, 1966, Volume I-II, Table 2, p. 620.

1963-1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 2, p. 11.

TABLE XX

ANNUAL AVERAGE VALUE PER TON, F.O.B. MINE, OF COAL* PRODUCED IN THE U.S., AND WHOLESALE PRICE INDEX, 1947-1967

Year	Average Value Per Ton (f.o.b. Mine)	Index of Average Value	Wholesale Price Index, Industrial Commodities
		------(1957-1959 = 100)------	
	(1)	(2)	(3)
1947	$4.16	84.90	75.3
1948	4.99	101.84	81.7
1949	4.88	99.59	80.0
1950	4.84	98.78	82.9
1951	4.92	100.41	91.5
1952	4.90	100.00	89.4
1953	4.92	100.41	90.1
1954	4.52	92.24	90.4
1955	4.50	91.84	92.4
1956	4.82	98.37	96.5
1957	5.08	103.67	99.2
1958	4.86	99.18	99.5
1959	4.77	97.35	101.3
1960	4.69	95.71	101.3
1961	4.58	93.47	100.8
1962	4.48	91.43	100.8
1963	4.39	89.59	100.7
1964	4.45	90.82	101.2
1965	4.44	90.61	102.5
1966	4.54	92.65	104.7
1967	4.62	94.29	106.3
1968p	4.72	96.32	108.7

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
p - preliminary.

Source: (Col. 1): U.S. Bureau of Mines, Minerals Yearbook, 1965, Table 28, p. 82-83, and 1967, Table 1, p. 331.
U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," Feb. 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 68, p. 94.

(Col. 3): U.S. Bureau of Labor Statistics, Handbook of Labor Statistics, 1967, Table 113, p. 230.
U.S. Bureau of Labor Statistics, Monthly Labor Review, January, 1969, Table D-3, p. 130.

nerra

FIGURE VIII

INDEX OF

ANNUAL AVERAGE VALUE PER TON, F. O. B. MINES, OF COAL PRODUCED IN THE U. S., AND WHOLESALE PRICE INDEX, 1947-1967

(1957-1959 = 100)

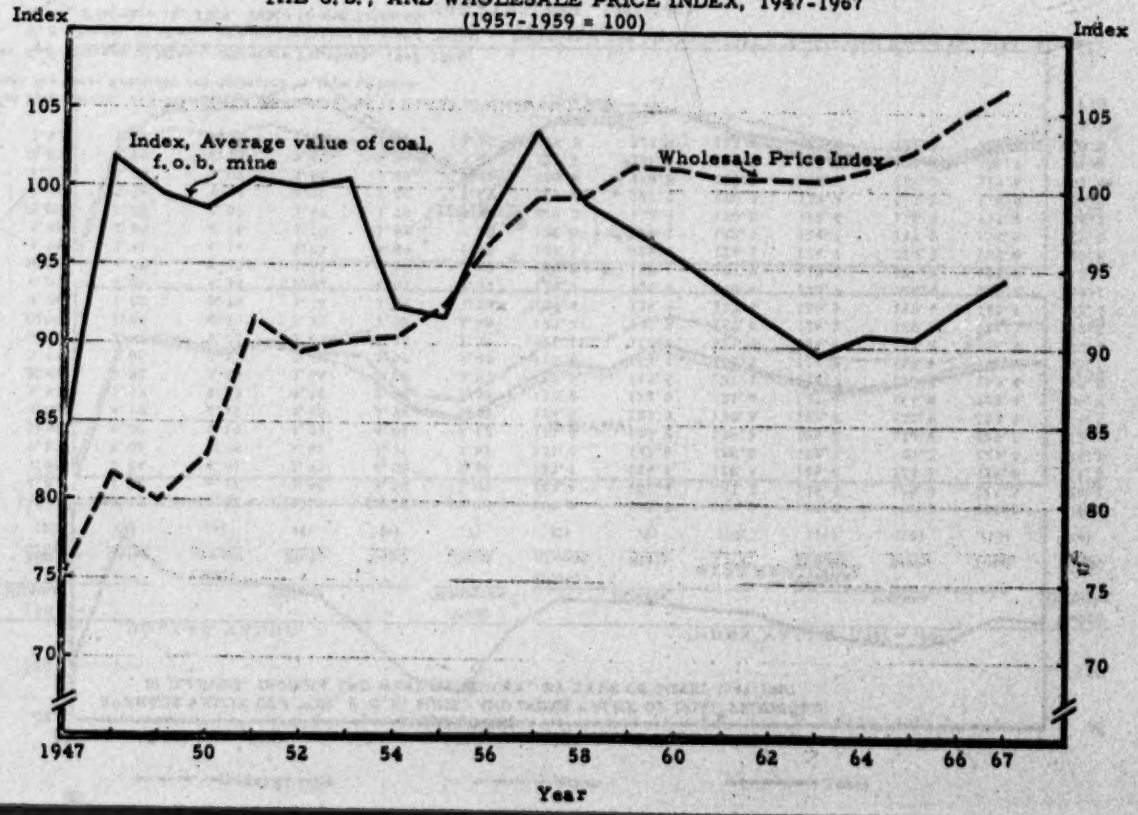


TABLE XXI

AVERAGE VALUE PER TON, F.O.B. MINE, AND INDEX VALUE OF COAL* PRODUCED IN ILLINOIS, INDIANA AND WEST KENTUCKY, BY TYPE OF MINE, 1947-1967

Year	DOLLAR VALUE							INDEX VALUE (1947 = 100)						
	Illinois			Indiana			West Kentucky*	Illinois			Indiana			West Kentucky*
	Underground	Strip	Total	Underground	Strip	Total	Total	Underground	Strip	Total	Underground	Strip	Total	Total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1947	$3.16	$3.13	$3.15	$3.32	$3.15	$3.22	$3.14	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1948	3.90	3.83	3.88	4.16	3.95	4.04	3.90	123.4	122.4	123.2	125.3	125.4	125.5	124.2
1949	4.10	3.90	4.04	4.21	3.93	4.05	3.66	129.7	124.6	128.3	126.8	124.8	125.8	116.6
1950	4.14	3.87	4.05	4.08	3.88	3.97	3.65	131.0	123.6	128.6	122.9	123.2	123.3	116.2
1951	4.15	3.92	4.07	4.19	3.93	4.04	3.62	131.3	125.2	129.2	126.2	124.8	125.5	115.3
1952	4.24	3.86	4.10	4.15	3.86	3.97	3.55	134.2	123.3	130.2	125.0	122.5	123.3	113.1
1953	4.02	3.82	3.95	4.23	3.76	3.94	3.35	127.2	122.0	125.4	127.4	119.4	122.4	106.7
1954	3.87	3.74	3.82	3.84	3.54	3.65	3.07	122.5	119.5	121.3	119.7	112.4	113.4	97.8
1955	3.71	3.57	3.66	3.81	3.49	3.59	3.00	117.4	114.1	116.2	114.8	110.8	111.5	95.5
1956	3.84	3.84	3.84	4.02	3.63	3.75	3.37	121.5	122.7	121.9	121.1	115.2	116.5	107.3
1957	4.02	3.97	4.00	4.19	3.79	3.92	3.54	127.2	126.8	127.0	126.2	120.3	121.7	112.7
1958	4.09	3.94	4.02	4.20	3.76	3.89	3.53	129.4	125.9	127.6	126.5	119.4	120.8	112.4
1959	4.10	4.01	4.06	4.34	3.92	4.05	3.52	129.7	128.1	128.9	130.7	124.4	125.8	112.1
1960	4.00	4.01	4.00	4.29	3.82	3.96	3.49	126.6	128.1	127.0	129.2	121.3	123.0	111.1
1961	3.87	3.96	3.91	4.14	3.79	3.89	3.48	122.5	126.5	124.1	124.7	120.3	120.8	110.8
1962	3.81	3.90	3.86	4.14	3.70	3.82	3.38	120.6	124.6	122.5	124.7	117.5	118.6	107.6
1963	3.77	3.83	3.80	4.07	3.67	3.78	3.32	119.3	122.4	120.6	122.6	116.5	117.4	105.7
1964	3.76	3.81	3.79	4.09	3.71	3.80	3.29	119.0	121.7	120.3	123.2	117.8	118.0	104.8
1965	3.78	3.72	3.74	4.07	3.81	3.85	3.31	119.6	118.8	118.7	122.6	121.0	119.6	105.4
1966	3.90	3.81	3.85	4.30	3.87	3.92	3.45	123.4	121.7	122.2	129.5	122.9	121.7	109.9
1967	3.96	3.83	3.88	4.31	3.87	3.91	3.42	125.3	122.4	123.2	129.8	122.9	121.4	108.9

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
* Average value data for West Kentucky not collected by type of mine.

Source: 1947-1966: U.S. Bureau of Mines, Minerals Yearbook, 1948-1966.
1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," Weekly Coal Report No. 2683, Supplement, February 14, 1969, Table 56 and Table 68.

FIGURE IX
INDEX OF AVERAGE VALUE PER TON, F.O.B. MINE, OF UNDERGROUND, STRIP AND TOTAL COAL PRODUCED IN ILLINOIS, INDIANA AND KENTUCKY, 1947-1967
(1947 = 100)

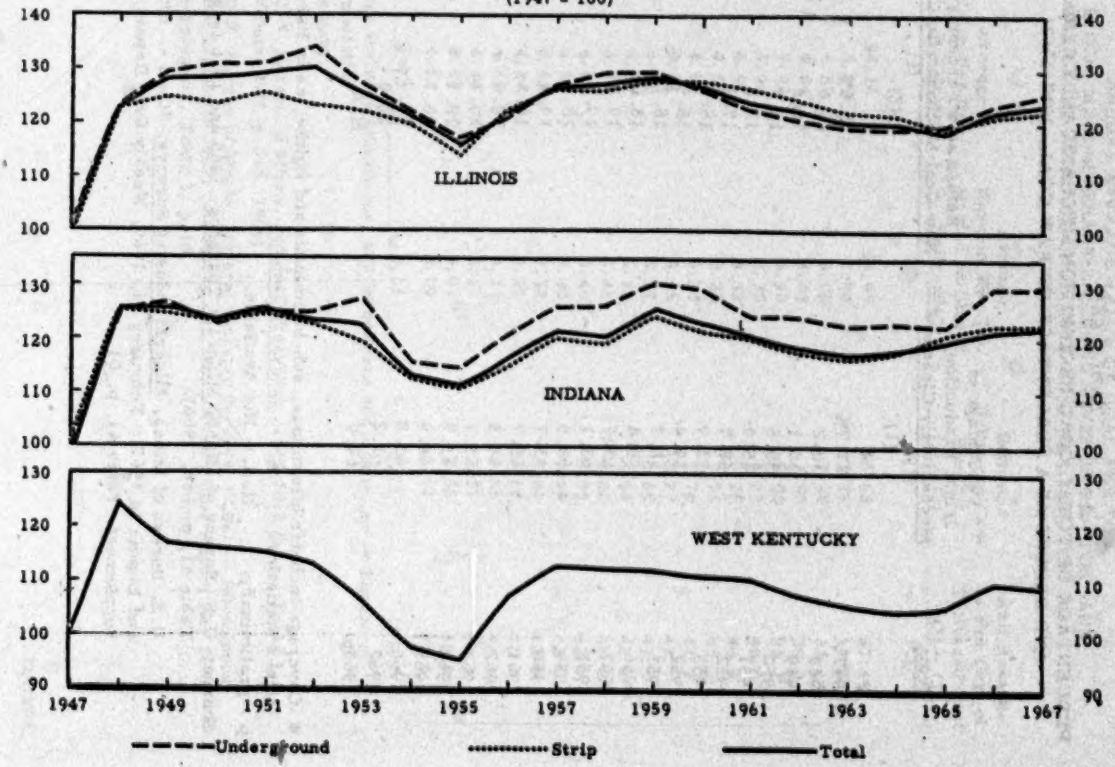


TABLE XXII

PERCENTAGE OF TOTAL COAL* PRODUCTION MECHANICALLY CLEANED, AND REFUSE AS A PERCENTAGE OF RAW COAL, 1947-1967

Year	Percentage of Total Production Mechanically Cleaned	Refuse as a Percentage of Raw Coal Mechanically Cleaned
	(1)	(2)
1947	27.7%	15.6%
1948	30.2	16.0
1949	35.1	16.8
1950	38.5	16.7
1951	45.0	17.2
1952	48.7	17.1
1953	52.9	18.2
1954	59.4	18.9
1955	58.7	18.7
1956	58.4	18.6
1957	61.7	19.3
1958	63.1	19.3
1959	65.5	20.0
1960	65.7	19.3
1961	65.7	19.3
1962	64.3	20.0
1963	63.1	20.1
1964	63.7	20.1
1965	64.9	20.7
1966	63.8	21.7
1967	63.2	22.0
1968p	64.0	N.A.

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

p - preliminary. N.A. - Not Available.

Source: U.S. Bureau of Mines, Minerals Yearbook, 1965 and 1966 (e.g., Table 41, p. 666, 1966).

U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 44, p. 61.

TABLE XXIII

ANNUAL AVERAGE VALUE OF COAL PER TON, F.O.B. MINE, AVERAGE RAILROAD REVENUE PER TON, AND INDICATED AVERAGE DELIVERED COST PER TON, 1947-1967

Year	Average Value Per Ton, f.o.b. Mine	Average Revenue Per Ton Hauled on Class I Railroads	Indicated Delivered Cost Per Ton (1) + (2)	Rail Revenue as Per Cent of Delivered Cost (2) ÷ (3)
	(1)	(2)	(3)	(4)
1947	$4.16	$2.49	$6.65	37.4%
1948	4.99	2.74	7.73	35.4
1949	4.88	3.00	7.88	38.1%
1950	4.84	3.09	7.93	39.0
1951	4.92	3.16	8.08	39.1
1952	4.90	3.35	8.25	40.6
1953	4.92	3.33	8.25	40.4
1954	4.52	3.23	7.75	41.7
1955	4.50	3.24	7.74	41.9
1956	4.82	3.45	8.27	41.7
1957	5.08	3.57	8.65	41.3
1958	4.86	3.58	8.44	42.4
1959	4.77	3.45	8.22	42.0
1960	4.69	3.40	8.09	42.0
1961	4.58	3.40	7.98	42.6
1962	4.48	3.32	7.80	42.6
1963	4.39	3.21	7.60	42.2
1964	4.45	3.11	7.56	41.1
1965	4.44	3.13	7.57	41.3
1966	4.54	3.01	7.55	39.9
1967	4.62	3.00	7.62	39.4
1968p	4.72	3.01	7.73	38.9

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

p - preliminary.

Source: U.S Bureau of Mines, Minerals Yearbook, 1948-1966 (e.g., Table 1, Volume I-II, p. 619, 1966).

U.S Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 1, p. 10.

TABLE XXIV
DELIVERED COST 1/ OF COAL* TO ELECTRIC UTILITIES IN THE EAST NORTH CENTRAL, WEST NORTH CENTRAL AND EAST SOUTH CENTRAL CENSUS REGIONS, 1951-1967

	Cents Per Million Btu		
Year	East North Central	West North Central	East South Central
	(1)	(2)	(3)
1951	25.9 2/	28.4 2/	N.A.
1952	26.0	29.0	20.1
1953	26.1	28.8	20.4
1954	24.9	27.2	19.2
1955	23.9	26.5	18.3
1956	24.6	26.9	18.7
1957	25.8	28.2	19.4
1958	25.8	28.1	19.4
1959	25.6	27.5	19.1
1960	25.3	27.0	19.6
1961	25.0	26.2	19.7
1962	24.3	25.8	19.3
1963	24.2	25.4	19.3
1964	24.0	25.3	18.6
1965	23.7	25.6	18.4
1966	24.0	25.7	18.9
1967	24.3	24.7	19.4

N.A.: Not Available

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ 1951-1961 - "As consumed."
1962-1967 - "F.O.B. plant."

2/ Regional averages computed by National Coal Association from state totals, not from individual plant data.

Source: 1951-1958: National Coal Association, Trends in Electric Utility Industry Experience, 1946-1958, Table 5.

1959-1967: National Coal Association, Steam-Electric Plant Factors, 1959-1968 Editions, Table 2.

nera

TABLE XXV
AVERAGE RAILROAD REVENUE PER TON OF COAL* HAULED, AND OPERATING REVENUE PER TON, ALL FREIGHT, CLASS I RAILROADS, 1947-1967

Year	Average Revenue Per Ton of Coal* Hauled	Revenue Per Ton (All Freight)	Index (1947 = 100) Average Revenue Per Ton of Coal* Hauled	Index (1947 = 100) Revenue Per Ton (All Freight)
	(1)	(2)	(3)	(4)
1947	$2.49	$4.82	100.0	100.0
1948	2.74	5.54	110.0	114.9
1949	3.00	6.02	120.5	124.9
1950	3.09	6.02	124.1	124.9
1951	3.16	6.11	126.9	126.8
1952	3.35	6.64	134.5	137.8
1953	3.33	6.76	133.7	140.2
1954	3.23	6.67	129.7	138.4
1955	3.24	6.40	130.1	132.8
1956	3.45	6.48	138.6	134.4
1957	3.57	6.79	143.4	140.9
1958	3.58	7.12	143.8	147.7
1959	3.45	7.06	138.6	146.5
1960	3.40	6.77	136.5	140.5
1961	3.40	6.80	136.5	141.1
1962	3.32	6.80	133.3	141.1
1963	3.21	6.66	128.9	138.2
1964	3.11	6.58	124.9	136.5
1965	3.13	6.69	125.7	138.8
1966	3.01	6.71	120.9	139.2
1967	3.00	6.77	120.5	140.5
1968p	3.01	7.11	120.9	147.5

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.
p - preliminary.

Source: (Col. 1): U.S. Bureau of Mines, Minerals Yearbook, 1948-1967.

(Col. 2): 1947-1957: Association of American Railroads, Statistics of Railroads of Class I in the United States, Calendar Years 1946-1957, p. 4.

1958-1967: Association of American Railroads, Statistics of Railroads of Class I in the United States, Years 1957-1967, p. 5.

nera

TABLE XXVI

AVERAGE ANNUAL PRODUCTION PER MINE, U.S. COAL* MINES, 1947-1967

Year	Thousand Tons			Index Value (1950 = 100)		
	Average Production, All Mines	Average Production, Mines Producing 500,000 Tons or More	Average Production, 50 Largest Mines	All Mines	Mines Producing 500,000 Tons or More	50 Largest Mines
	(1)	(2)	(3)	(4)	(5)	(6)
1947	72.5	865	N.A.	132.4	101.9	N.A.
1948	66.0	860	N.A.	120.6	101.3	N.A.
1949	51.2	780	N.A.	93.4	91.9	N.A.
1950	54.8	849	1,376	100.0	100.0	100.0
1951	66.6	856	1,503	131.7	100.8	109.3
1952	64.2	818	1,396	117.2	96.3	101.5
1953	68.5	898	1,606	125.2	105.8	116.7
1954	63.9	911	1,469	116.7	107.3	106.8
1955	59.1	969	1,779	108.0	114.1	129.3
1956	58.8	988	1,815	107.4	116.4	132.0
1957	57.7	976	1,913	105.4	115.0	139.1
1958	49.7	940	1,659	90.7	110.7	120.6
1959	53.4	967	1,766	97.5	113.9	128.4
1960	52.8	1,015	1,882	96.4	119.6	136.8
1961	52.7	1,041	1,908	96.2	122.6	138.7
1962	54.5	1,049	1,964	99.6	123.6	142.8
1963	57.8	1,085	2,111	105.6	127.8	153.5
1964	63.8	1,122	2,242	116.6	132.2	162.9
1965	70.8	1,131	2,397	129.4	133.2	174.3
1966	79.1	1,128	2,495	144.5	132.9	181.4
1967	94.1	1,164	2,718	171.8	137.1	197.6
1968p	94.0	N.A.	2,729	171.5	N.A.	198.3

N.A.: Not Available.

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

p - preliminary.

TABLE XXVI

AVERAGE ANNUAL PRODUCTION PER MINE, U.S. COAL MINES, 1947-1967 (CONTINUED)

Source: (Col. 1): 1947-1966: U.S. Bureau of Mines, Minerals Yearbook, 1947-1966.

1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 1, p. 10.

(Col. 2): 1947-1966: U.S. Bureau of Mines, Minerals Yearbook, 1947-1966.

1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 14, p. 23.

(Col. 3): Coal Mine Directory - Keystone Coal Buyers Manual, Coal Production in the United States for the Year of 1967, Table 4, p. 4.

TABLE XXVII
U.S. COAL* MINES PRODUCING 500,000 TONS OR MORE PER YEAR: NUMBER OF MINES, PRODUCTION AND PER CENT OF TOTAL COAL* PRODUCTION, 1947-1967

Year	Number of Mines	Production (Million tons)	Per Cent of Total Production
	(1)	(2)	(3)
1947	303	262	41.5%
1948	265	228	38.0
1949	164	128	29.3
1950	218	185	35.9
1951	264	226	42.4
1952	231	189	40.5
1953	226	203	44.4
1954	190	173	44.1
1955	227	220	47.4
1956	246	243	48.6
1952	245	239	48.5
1958	200	188	45.8
1959	212	205	49.9
1960	202	205	49.3
1961	195	203	50.4
1962	204	214	50.6
1963	224	243	52.9
1964	238	267	54.9
1965	259	293	57.2
1966	274	309	57.9
1967	281	327	59.1

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

Source: 1947-1966: U.S. Bureau of Mines, Minerals Yearbook, 1948-1966 (e.g., Table 12, p. 630, Vol. I-II, 1966).

1967: U.S. Bureau of Mines, Mineral Industry Surveys, "Coal -- Bituminous and Lignite in 1967," February 14, 1969, Weekly Coal Report No. 2683, Supplement, Table 14, p. 23.

TABLE XXVIII
OIL COMPANIES WITH COAL INTERESTS

PART A: OIL COMPANIES WITH COAL SUBSIDIARIES

Oil Company	Coal Subsidiary	Year of Acquisition of Entry	1968 Coal Production (tons)	Per Cent of Total U.S. Coal Production in 1968
(1)	(2)	(3)	(4)	(5)
Gulf Oil Co.	Pittsburg and Midway Coal Mining Co.	1964	9,249,500	1.70%
Continental Oil Co.	Consolidation Coal Co.	1966	59,884,621	10.99
Occidental Petroleum Corp.	Island Creek Coal Co.	1968	32,926,752 1/	6.04
Standard Oil Co. of New Jersey	Monterey Coal Co.	1968	2/	-
Standard Oil Co. of Ohio	Old Ben Coal Co.	1968	9,923,107	1.82
Kerr-McGee Corp.	Kerr-McGee Corp.	1969	3/	-
North American Resources Corp.	Thompson Creek Coal & Coke Corp.	1969	4/	-

PART B: ADDITIONAL OIL COMPANIES WITH COAL HOLDINGS NOT SHOWN IN PART A

Oil Company	Location of Holdings
(1)	(2)
Atlantic Richfield Co.	Colorado
Sinclair Oil Corp.	West of the Mississippi River
Shell Oil Co.	Montana
Sun Oil Co.	Wyoming

TABLE XXVIII
OIL COMPANIES WITH COAL INTERESTS (CONTINUED)

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Includes 7,011,000 tons of Maust Coal Corp., acquired by Island Creek in 1969.
2/ Initial production announced for the fall of 1970.
3/ Initial production undertaken in early 1969.
4/ No production since 1966, but company is reported to be investigating potential markets for subsidiary's reserves.

Source: Part A: (Col. 1, 2 & 3): Moody's Investors Service, Moody's Industrial Manual, 1968 (New York: Moody's Investor's Service, 1968).

Federal Trade Commission, Statistical Report No. 4, "Large Mergers in Manufacturing and Mining, 1948-1968," April 1969.

Company Annual Reports for 1968.

The Wall Street Journal, June 18, 1969, p. 6.

(Col. 4): Coal Age, April, 1969, p. 38.

(Col. 5): Preliminary 1968 production figure (545,000,000 tons) from U.S. Bureau of Mines, Mineral Industry Surveys, Weekly Coal Report No. 2700, June 13, 1969, p. 4.

Part B: Sinclair Oil Corp., Proxy Statement for Special Meeting of Stockholders dated November 29, 1969, p. 19.

Price Waterhouse & Co., Selected Information Requested in Subpoena Duces Tecum Issued by Federal Trade Commission under Date of December 31, 1968 on Behalf of Kennecott Copper Corporation, March 6, 1969.

Coal Mining & Processing, February, 1969, p. 10.

Sun Oil Co., 1968 Annual Report, p. 11.

TABLE XXIX

UTILITY MERGERS AND ACQUISITIONS AFFECTING COMPANIES OPERATING IN THE MIDWEST STATES, 1955-1969 -- EFFECTED OR CURRENTLY PENDING

A. MERGERS & ACQUISITIONS INVOLVING PRIVATELY-OWNED COMPANIES ONLY

		MIDWEST COMPANY INVOLVED					OTHER COMPANY INVOLVED					
Year Merger	Data	Name	Total Assets	Gross Operating Revenues	Sales	Coal* Consumption	Name	Total Assets	Gross Operating Revenues	Sales	Coal* Consumption	Also in Midwest
			----($ Million)----		(Million kwh)	(1,000 tons)		----($Million)----		(Million kwh)	(1,000 tons)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1955	1954	American Electric Power (through Ohio Power)	$1,035	$230	16,562	8,642 1/	Central Ohio Light & Power	$ 15	$ 5	246	N.A.	
1955	1954	St. Joseph Light & Power	21	7	276	36 2/	Missouri Service 1/	1 3/	1 4/	13	N.A.	X
1955	1954	Union Electric (through Missouri Power & Light)	448	114	7,036	2,548 1/	Segelhorst Electric	N.A.	N.A.	N.A.	N.A.	X
1956	1955	Interstate Power	63	19	639	230 5/	A.O. Fisher Electric	N.A.	N.A.	N.A.	N.A.	X
1956	1955	Interstate Power	63	19	639	230 5/	Northwestern Illinois Gas & Electric	3	1	55	N.A.	X
1956	1955	Iowa Public Service	92	30	735	93	Sac County Electric 1/	1 3/	**	12	N.A.	X
1956	1955	American Electric Power (through Ohio Power)	1,071	258	20,414	13,050 6/	Seneca Light & Power	N.A.	N.A.	N.A.	N.A.	
1957	1956	American Electric Power (through Ohio Power)	1,159	268	20,721	16,183 6/	Celeryville Mutual Light & Power	N.A.	N.A.	N.A.	N.A.	
1957	1956	Northern States Power	577	139 7/	5,002	1,457	Wisconsin Hydro-Electric	9	2	78	--	X
1958	1957	Union Electric	525	129	7,601	2,674	R.W. Foss Electric	N.A.	N.A.	N.A.	N.A.	X
1960	1959	Iowa Southern Utilities	51	17	496	291	Burlington Power & Light	N.A.	N.A.	N.A.	N.A.	X
1960	1959	Northern States Power (through Northern States Power, Wisc.)	554	170 7/	6,113	1,576	Mississippi Valley Public Service	11	3	N.A.	56	X
1962	1961	Central Illinois Public Service	237	66	3,025	1,486	Illinois Electric & Gas	N.A.	N.A.	N.A.	N.A	X
1963	1962	Wisconsin Power & Light	209	56	2,134	824	Pleasant Springs Light & Power	N.A.	N.A.	N.A.	N.A.	X
1964	1963	Wisconsin Power & Light	211	59	2,290	987	Roxbury Light & Power	N.A.	N.A.	N.A.	N.A.	X
							Stoughton Light & Fuel	N.A.	N.A.	N.A.	N.A.	X
1964	1963	Northern States Power	685	216 7/	8,247	2,364	Deichen Power (Minn.)	N.A.	N.A.	N.A.	N.A.	X
1966	1965	Commonwealth Edison	1,997	593	31,637	14,936 11/	Central Illinois Electric & Gas	99	41	1,079	197	X
1967	1966	American Electric Power	1,988	488 8/	44,625	25,249 6/ 9/	Michigan Gas & Electric	25	12 10/	265	--	
* 1968	1967	American Electric Power	2,156 12/	524 8/ 12/	50,119	26,367 6/ 9/	Columbus & So. Ohio Electric	319	84	4,356	2,066	
* 1968	1967	Illinois Power	578	177	6,414	3,185	Central Illinois Public Service	345	99	4,354	2,903	X
* 1968	1967	Commonwealth Edison	2,403	711	37,685	17,465 11/	Central Illinois Light	238	69	2,182	1,205 13/	X
* 1968	1967	Iowa Power & Light	208	68	2,069	484	Iowa-Illinois Gas & Electric	211	80	2,093	395	X
* 1969	1967	Cincinnati Gas & Electric	741	209 15/	7,447	3,159	Cleveland Electric Illuminating	529	189 14/	11,254	4,726 11/	
							Duquesne Light	550	133	8,629	4,059	
							Dayton Power & Light	362	143	5,262	1,779 11/	
							Ohio Edison	812	232	14,210	5,106	
							Toledo Edison	335	70	4,158	1,415	
* 1969	1967	Arkansas-Missouri Power	42	16	586	--	Middle South Utilities	1,365	331	21,520	--	

UTILITY MERGERS AND ACQUISITIONS AFFECTING COMPANIES OPERATING IN THE MIDWEST STATES, 1955-1969 -- EFFECTED OR CURRENTLY PENDING

A. MERGERS & ACQUISITIONS INVOLVING PRIVATELY-OWNED COMPANIES ONLY (CONTINUED)

@ Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

* Pending.

** Less than $500,000.

N.A.: Not available.
--: No consumption.

1/ Data from Federal Power Commission, Statistics of Privately Owned Electric Utilities in the United States (Column 9, 10 and 11) or Steam-Electric Plant Construction Cost and Annual Production Expenses (Column 7).

2/ 1955 coal consumption. 1954 figure not available.

3/ Listed in source as "Total Assets and Other Debits."

4/ Listed in source as "Total Electric Operating Revenue."

5/ Consumption of Interstate Power Co. (Iowa) only.

6/ Includes 1/2 of coal consumption of Beech Bottom Power Co., owned 50% by Ohio Power Co. and 50% by a non-affiliated utility company. Also includes coal consumed by Ohio Valley Electric Corp., owned 37.8% by American Electric Power and OVEC's wholly-owned subsidiary Indiana & Kentucky Electric Corp. (All coal purchasing for OVEC is handled by AEP.)

7/ Listed in source as "Total Gross Earnings."

8/ Listed in source as "Operating Revenues (Electric)."

9/ 1966 consumption includes 1/3 of coal consumed at Kammer Plant, owned 1/3 by Ohio Power Co. of American Electric Power. 1967 consumption includes all coal consumed at Kammer Plant, reflecting Ohio Power's total ownership of plant as of January 1, 1967.

10/ Listed in source as "Gross Revenues."

11/ Includes equivalent for relatively small quantities of other fuels.

12/ Excludes Michigan Gas & Electric Co. Accounts not consolidated pending sale of gas properties of Michigan Gas & Electric.

13/ Includes 49,538 tons consumed for production of process steam.

14/ Includes revenue billed as of December 31, 1967, only.

15/ Listed in source as "Total Revenue."

Source: (Col. 1, 3-6, 8-11): Moody's Investors Service, Moody's Public Utility Manual, 1955-1968 (New York: Moody's Investors Service, 1955-1968), unless otherwise noted.

UTILITY MERGERS AND ACQUISITIONS AFFECTING COMPANIES OPERATING IN THE MIDWEST STATES, 1955-1969 -- EFFECTED OR CURRENTLY PENDING

A. MERGERS & ACQUISITIONS INVOLVING PRIVATELY-OWNED COMPANIES ONLY (CONTINUED)

Source: (Col. 7 and 12): 1954-1957: Carl J. Coash (Publisher), Keystone Coal Buyers Manual, 1957-1960 (New York: McGraw-Hill Publishing Co., 1957-1960), unless otherwise noted.

1959-1967: National Coal Association, Steam-Electric Plant Factors, 1959-1968 Editions (Washington, D. C.: National Coal Association, 1960-1968).

nern

UTILITY MERGERS AND ACQUISITIONS AFFECTING COMPANIES OPERATING IN THE MIDWEST STATES, 1955-1969 -- EFFECTED OR CURRENTLY PENDING

B. ACQUISITIONS OF MUNICIPAL ELECTRIC SYSTEMS

ACQUIRING UTILITY							MUNICIPAL SYSTEM				
Year Acquisition	Data	Name	Total Assets	Gross Operating Revenues	Sales	Coal * Consumption	Name	Total Assets	Gross Operating Revenues	Sales	Coal * Consumption
			----($ Million)----		(Million kwh)	(1,000 tons)		---($ Thousand)---		(Thousand kwh)	(1,000 tons)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1955	1954	Commonwealth Edison	$ 1,188	$ 310	15,597	8,013	Hinsdale, Illinois	N.A.	N.A.	N.A.	N.A.
1956	1955	Illinois Power	360	78	3,100	1,533	Salem, Illinois	N.A.	N.A.	N.A.	--
1957	1956	Cincinnati Gas & Electric	358	114	4,124	2,042	St. Bernard, Ohio	N.A.	N.A.	N.A.	N.A.
1957	1956	Northern States Power	577	139 1/	4,379	1,457	Delhi, Minnesota	N.A.	N.A.	N.A.	--
							North Redwood, Minnesota	N.A.	N.A.	N.A.	--
1957	1956	American Electric Power (through Ind. & Mich. Elec.)	1,159	268	20,721	16,138 2/	Kendallville, Indiana	N.A.	N.A.	N.A.	N.A.
1958	1957	Missouri Public Service	57	13	374	80	Burgess, Missouri	N.A.	N.A.	N.A.	--
1958	1957	American Electric Power (through Ind. & Mich. Elec.)	1,283	284	21,428	17,428 2/	Monroe, Indiana	N.A.	N.A.	N.A.	--
1959	1958	Northern Ind. Public Service	353	92 3/	2,763	702	Pierceton, Indiana	N.A.	N.A.	N.A.	--
1960	1959	American Electric Power (through Ind. & Mich. Elec.)	1,458	324	25,866	18,972 2/	Decatur, Indiana	N.A.	N.A.	N.A.	19
1960	1959	American Electric Power (through Ohio Power)	1,458	324	25,866	18,972 2/	Minerva, Ohio	N.A.	N.A.	N.A.	N.A.
1961	1960	Northern Ind. Public Service	422	124 3/	3,728	1,135	Goshen, Indiana	N.A.	N.A.	N.A.	N.A.
1961	1960	Public Service of Indiana	471	92 4/	5,134	2,776	Tipton, Indiana	N.A.	N.A.	N.A.	--
1962	1961	Illinois Power	422	116	3,987	2,063	Bloomington, Illinois	N.A.	300	N.A.	--
1962	1961	American Electric Power (through Ind. & Mich. Elec.)	1,561 5/	352 3/ 5/	28,522	20,018 2/	Portland, Indiana	N.A.	N.A.	N.A.	N.A.
1962	1961	Otter Tail Power	74	21	609	588	Wilton, Minnesota	N.A.	N.A.	N.A.	--
1962	1961	Commonwealth Edison	1,840	492	23,338	10,821	Woodstock, Illinois	N.A.	N.A.	N.A.	28
1964	1963	Public Service of Indiana	503	113 4/	6,295	3,227	Crothersville, Indiana	N.A.	N.A.	N.A.	--
1964	1963	American Electric Power (through Ohio Power)	1,724	394 6/	33,244	21,988 2/	Paulding, Ohio	N.A.	N.A.	N.A.	N.A.
1964	1963	Iowa Power & Light	172	57	1,624	323	Grimes, Iowa	N.A.	N.A.	N.A.	N.A.
1965	1964	Public Service of Indiana	514	120 4/	6,848	3,451	Connersville, Indiana	N.A.	N.A.	N.A.	--
1965	1964	American Electric Power (through Ohio Power)	1,753	419 6/	36,218	22,634 2/	Willard, Ohio	N.A.	283	11,100 7/	N.A.
1966	1965	Northern Ind. Public Service	636	191 3/	5,430	1,850	Nappanee, Indiana	N.A.	455	20,200 7/	18
1966	1965	Illinois Power	517	151	5,443	3,028	Fithian, Illinois	N.A.	N.A.	N.A.	--
							Sawyerville, Illinois	N.A.	N.A.	N.A.	--
1967	1966	Public Service of Indiana	540	136 4/	8,249	3,881	Rushville, Indiana	N.A.	N.A.	N.A.	23
1967	1966	Northern States Power	820	254 1/	10,554	3,092	Bayport, Minnesota	N.A.	N.A.	8/	--
1967	1966	Wisconsin Public Service	194	68	2,831	1,023	Kewanee, Wisconsin	N.A.	179	N.A.	--
1967	1966	Michigan Gas & Electric	25	12 9/	265	--	Constantine, Michigan	N.A.	N.A.	N.A.	N.A.
1968	1967	Northern States Power	926	271 1/	11,564	2,691	Mazeppa, Minnesota	N.A.	53	50 7/	N.A.
1968	1967	Public Service of Indiana	551	144 4/	8,821	3,892	Vevay, Indiana	N.A.	N.A.	N.A.	--
1968	1967	Illinois Power	578	177	6,414	3,185	Ogden, Illinois	N.A.	N.A.	N.A.	--

UTILITY MERGERS AND ACQUISITIONS AFFECTING COMPANIES OPERATING IN THE MIDWEST STATES, 1955-1969 -- EFFECTED OR CURRENTLY PENDING

B. ACQUISITIONS OF MUNICIPAL ELECTRIC SYSTEMS (CONTINUED)

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

N. A. : Not available.
-- No consumption.

1/ Listed in source as "Total Gross Earnings."
2/ Includes 1/2 of coal consumption of Beech Bottom Power Co., owned 50% by Ohio Power Co. and 50% by a non-affiliated utility company. Also includes coal consumption of Ohio Valley Electric Corp. and OVEC's wholly-owned subsidiary, Indiana & Kentucky Electric Corp. (all coal purchasing for OVEC is handled by AEP). From 1959 on, includes 1/3 of coal consumed at the Kammer Plant, owned 1/3 by Ohio Power Co. and 2/3 by a non-affiliated utility company.
3/ Listed in source as "Operating Revenues."
4/ Listed in source as "Total Operating Revenue (All Electric)."
5/ Based on "Uniform System of Accounts" effective January 1, 1961. Data for 1960 and earlier years not strictly comparable.
6/ Listed in source as "Operating Revenues (Electric)."
7/ Total annual generation. Kwh sales figure not available.
8/ No generation.
9/ Listed in source as "Gross Revenues."

Source: (Cols. 1-6 and 8): Moody's Investors Service, Moody's Public Utility Manual, 1955-1968 (New York: Moody's Investors Service, 1955-1968).

(Col. 7) 1954: Federal Power Commission, Steam-Electric Plant Construction Cost and Annual Production Expenses, 1954 Supplement.

1955-1958: Carl J. Coash (Publisher), Keystone Coal Buyers Manual (New York: McGraw-Hill Publishing Co., 1957-1960).

(Cols. 7 and 12): National Coal Association, Steam-Electric Plant Factors, 1959-1968 Editions (Washington, D. C.: National Coal Association, 1960-1968).

(Cols. 9-11): American Public Power Association, Public Power, January issues, 1962-1968.

TABLE XXX

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS IN THE MIDWEST STATES, 1967

(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity	Total Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)
					(Mw)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Tennessee Valley Authority 2/					15,973		6,844	19,930
		Paradise	Drakesboro, Ky.	1963	1,408.0		3,807		
		Shawnee	Paducah, Ky.	1953	1,725.0		4,230		
		Gallatin	Gallatin, Tenn.	1956	1,255.2		2,477		
		Johnsonville A & B	Johnsonville, Tenn.	1951/1958	1,485.2		2,615		
		Kingston	Kingston, Tenn.	1954	1,700.0		3,088		
		John Sevier	Rogersville, Tenn.	1955	823.3		1,368		
		T.H. Allen	Memphis, Tenn.	1958	990.0		956		
		Bull Run	Oak Ridge, Tenn.	1967	950.0		1,389		
2	Commonwealth Edison Co.					9,153			17,465
		Calumet	Chicago, Ill.	1921	234.5		241		
		Crawford	Chicago, Ill.	1924/1928	701.5		1,539		
		Dixon	Dixon, Ill.	1918	119.0		169		
		Fisk	Chicago, Ill.	1903/1914	601.6		1,175		
		Joliet	Joliet, Ill.	1917	1,862.4		4,243		
		Northwest	Chicago, Ill.	1912	223.8		170		
		Powerton	Pekin, Ill.	1928	320.0		554		
		Ridgeland	Stickney, Ill.	1950	690.0		1,208		
		Waukegan	Waukegan, Ill.	1923	1,042.8		1,945		
		Will County	Lockport Twp., Ill.	1955	1,268.9		2,918		
		Fordam	Rockford, Ill.	1896	75.3		55		
		Sabrooke	Rockford, Ill.	1949	146.4		178		
		Kincaid	Kincaid, Ill.	1967	659.7		1,093		

Total Company Capacity (Mw)	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)	Total Company Consumption (9) + (10)	Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
(7)	(8)	(9)	(10)	(11)	(12)
15,973		6,844	19,930	26,774 3/	21.22%
	3,807				
	4,230				
	2,477				
	2,615				
	3,088				
	1,368				
	956				
	1,389				
9,153			17,465	17,465 3/	18.59
	241				
	1,539				
	169				
	1,175				
	4,243				
	170				
	554				
	1,208				
	1,945				
	2,918				
	55				
	178				
	1,093				

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity (Mw)	Total Company Capacity (Mw)	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Commonwealth Edison Co. of Indiana, Inc.	State Line	Hammond, Ind.	1929	972.0		1,977		
3	American Electric Power Co.					9,307		17,828 4/	8,539
	Indiana & Michigan Electric Co.	Breed	Sullivan, Ind.	1960	450.0		1,079		
		Tanners Creek	Lawrenceburg, Ind.	1951	1,098.0		2,280		
		Twin Branch	Mishawaka, Ind.	1925	394.0		649		
	Kentucky Power Co.	Big Sandy	Louisa, Ky.	1963	265.0		778		
	Ohio Valley Electric Corp. 5/					2,390		2,728 6/	3,753 6/
	Indiana-Kentucky Electric Corp.	Clifty Creek	Madison, Ind.	1955	1,303.6		3,753		
4	Union Electric Co.					3,118		-	4,303
		Cahokia	Monsanto, Ill.	1923	300.0		233		
		Venice #2	Venice, Ill.	1942	500.0		1,028		
		Ashley	St. Louis, Mo.	1904	70.0		71		
		Meramec	St. Louis, Mo.	1953	923.0		2,411		
		Sioux	W. Alton, Mo.	1967	549.8		466		
	Missouri Power & Light Co.	Kirksville 7/	Kirksville, Mo.	-/1943 8/	5.0		18		
		Mexico 7/	Mexico, Mo.	-/1950 8/	19.0		76		

otal Company Capacity	1967 Coal[8] Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)	Total Company Consumption (9) + (10)	Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
)----------					
(7)	(8)	(9)	(10)	(11)	(12)
	1,977				
9,307		17,828 4/	8,539	26,367	9.09%
	1,079				
	2,280				
	649				
	778	2,728 6/	3,753 6/	6,481 6/	4.00 6/
2,390					
	3,753				
			4,303	4,303	4.58
3,118					
	233				
	1,028				
	71				
	2,411				
	466				
	18				
	76				

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS
IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity	Total Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States
					(Mw)				(Total of Col. 8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
5	Wisconsin Electric Power Co.					2,567		-	4,207
		Commerce St.	Milwaukee, Wisc.	1903	67.5		6		
		East Wells St. 7/	Milwaukee, Wisc.	N.A.	13.7		33		
		Lakeside	St. Francis, Wisc.	1920	310.8		327		
		N. Oak Creek	Oak Creek, Wisc.	1953	500.0		1,226		
		Port Washington	Port Washington, Wisc.	1935	400.0		782		
		S. Oak Creek	Oak Creek, Wisc.	1959	1,170.0		1,831		
	Wisconsin Michigan Power Co.	Appleton 7/	Appleton, Wisc.	N.A.	15.0		2		
6	Public Service Co. of Indiana					1,664		-	3,892
		Dresser	Terre Haute, Ind.	1924	221.0		240		
		Edwardsport	Edwardsport, Ind.	1918/1944	133.0		341		
		Gallagher	New Albany, Ind.	1958	600.0		1,748		
		Noblesville	Noblesville, Ind.	1950	100.0		65		
		Wabash River	Terre Haute, Ind.	1953	521.0		1,498		
7	Electric Energy, Inc.					1,100		-	3,548
		Joppa	Joppa, Ill.	1953	1,100.3		3,548		
8	Illinois Power Co.					1,394		-	3,185
		Havana	Havana, Ill.	1947	230.0		366		
		Hennepin	Hennepin, Ill.	1953	306.3		654		
		Vermilion	Oakwood, Ill.	1955	182.3		483		
		Wood River	Wood River, Ill.	1949	650.1		1,682		

Total Company Capacity	1967 Coal* Consumption (1,000 tons)				Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
	In Midwest States	In Other States	Total Consumption of Company in Midwest States	Total Company Consumption	
w)----------			(Total of Col. 8)	(9) + (10)	
(7)	(8)	(9)	(10)	(11)	(12)
2,567		-	4,207	4,207	4.48%
	6				
	33				
	327				
	1,226				
	782				
	1,831				
	2				
1,664		-	3,892	3,892	4.14
	240				
	341				
	1,748				
	65				
	1,498				
1,100		-	3,548	3,548 3/	3.78
	3,548				
1,394		-	3,185	3,185	3.39
	366				
	654				
	483				
	1,682				

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS
IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity	Total Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)
					(Mw)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
9	Central Illinois Public Service Co.					1,072		-	2,903
		Coffeen	Montgomery Co., Ill.	1965	330.0		1,066		
		Grand Tower	Grand Tower, Ill.	1922	216.0		499		
		Hutsonville	Hutsonville, Ill.	1940	200.0		513		
		Meredosia	Meredosia, Ill.	1948	325.0		825		
10	Northern States Power Co. (Minn.)					2,217		254	2,437
		Black Dog	Minneapolis, Minn.	1952	486.7		754		
		High Bridge	St. Paul, Minn.	1924	463.8		642		
		Minnesota Valley	Granite Falls, Minn.	1930	66.0		59		
		Red Wing 7/	Red Wing, Minn.	N.A.	23.0		28		
		Riverside	Minneapolis, Minn.	1911/1916	518.4		795		
		Southeast	Minneapolis, Minn.	N.A.	30.0		18		
		Island 7/	St. Paul, Minn.	N.A.	20.0		15		
		Whitney 7/	St. Cloud, Minn.	1940	20.0		12		
		Wilmarth	Mankato, Minn.	1948	25.0		23		
		Winona	Winona, Minn.	1917	26.0		34		
	Northern States Power Co. (Wisc.)	Edison 7/	La Crosse, Wisc.	N.A.	6.5		1		
		French Island	La Crosse, Wisc.	1940	25.0		56		

otal Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States	Total Company Consumption	Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
)----------			(Total of Col. 8)	(9) + (10)	
(7)	(8)	(9)	(10)	(11)	(12)
1,072		-	2,903	2,903	3.09%
	1,066				
	499				
	513				
	825				
2,217		254	2,437	2,691	2.59
	754				
	642				
	59				
	28				
	795				
	18				
	15				
	12				
	23				
	34				
	1				
	56				

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS
IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity	Total Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)
					(Mw)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
11	Indianapolis Power & Light Co.					1,101		-	2,159
		E. W. Stout	Indianapolis, Ind.	1931	383.8		821		
		Perry K & W	Indianapolis, Ind.	N.A.	59.1		51		
		H. T. Prichard	Centerton, Ind.	1949	396.4		869		
		Petersburg	Petersburg, Ind.	1967	261.7		418		
12	Kansas City Power & Light Co.					1,209		-	1,989
		Grand Ave.	Kansas City, Mo.	1903	126.8		38		
		Hawthorn	Kansas City, Mo.	1951	363.0		160		
		Montrose	Montrose, Mo.	1958	563.1		1,791		
13	Northern Indiana Public Service Co.					871		-	1,969
		Bailly	Dune Acres, Ind.	1962	194.0		446		
		Michigan City	Michigan City, Ind.	1930	215.0		289		
		D. H. Mitchell	Gary, Ind.	1956	414.3		1,213		
		Nappanee 7/	Nappanee, Ind.	N.A.	12.3		21		
14	Louisville Gas & Electric Co.					1,253		-	1,929
		Cane Run	Louisville, Ky.	1954	744.7		1,686		
		Paddy's Run	Louisville, Ky.	1942	337.5		243		

Total Company Capacity (MW)	1967 Coal Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)	Total Company Consumption (9) + (10)	Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
(7)	(8)	(9)	(10)	(11)	(12)
1,101		-	2,159	2,159	2.30%
	821				
	51				
	869				
	418				
1,209		-	1,989	1,989	2.12
	38				
	160				
	1,791				
		-	1,969	1,969	2.10
871	446				
	289				
	1,213				
	21				
		-	1,929	1,929	2.05
1,253	1,686				
	243				

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS
IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity	Total Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)
					(Mw)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
15	Wisconsin Power & Light Co.					643		-	1,340
		Blackhawk	Beloit, Wisc.	1917/1949	57.5		50		
		Edgewater	Sheboygan, Wisc.	1931	129.0		250		
		Nelson Dewey	Cassville, Wisc.	1959	227.3		626		
		Rock River	Beloit, Wisc.	1954	159.4		414		
16	Central Illinois Light Co.					523		-	1,205
		E. D. Edwards	Bartonville, Ill.	1960	125.0		418		
		Liberty St.	Peoria, Ill.	1917	25.0		59 9/		
		R. S. Wallace	E. Peoria, Ill.	1925	301.4		728		
17	Kentucky Utilities Co.					762		-	1,108
		E. W. Brown	Bergin, Ky.	1957	293.2		498		
		Green River	Carrollton, Ky.	1950	263.6		530		
		Pineville	Pineville, Ky.	1923	37.5		30		
		Tyrone	Tyrone, Ky.	1947	137.5		50		
18	Wisconsin Public Service Corp.					607		-	1,058
		Weston	Green Bay, Wisc.	1954	135.0		130		
		Pulliam	Rothchild, Wisc.	1927	392.5		928		
19	Minnesota Power & Light Co.					520		-	949
		Aurora	Aurora, Minn.	1953	116.1		319		
		Clay Boswell	Cohasset, Minn.	1958	150.0		427		
		M. L. Hibbard	Duluth, Minn.	1931	122.5		178		

Total Company Capacity w)	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)	Total Company Consumption (9) + (10)	Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
(7)	(8)	(9)	(10)	(11)	(12)
643	50 250 626 414	-	1,340	1,340	1.43%
523	418 59 9/ 728	-	1,205	1,205	1.28
762	498 530 30 50	-	1,108	1,108	1.18
607	130 928	-	1,058	1,058	1.13
520	319 427 178	-	949	949	1.01

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS
IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

Rank	Company and Subsidiary	Plant	Location	Initial Year of Operation	Plant Capacity	Total Company Capacity	1967 Coal* Consumption (1,000 tons) In Midwest States	In Other States	Total Consumption of Company in Midwest States
					(Mw)				(Total of Col. 8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
19	Minnesota Power & Light Co. (Continued)								
	Superior Water, Light & Power Co.	Winslow	Superior, Wisc.	1894/1942	25.2		25		
20	Dairyland Power Coop.					263		-	746
		Alma	Alma, Wisc.	1947	187.8		610		
		Genoa 7/	Genoa, Wisc.	N.A.	14.0		4		
		Stoneman	Cassville, Wisc.	1950	51.8		132		
TOTAL					41,457.4	55,317		24,926	84,861

* Coverage includes bituminous, sub-bituminous, and lignite, as in Bureau of Mines statistics.
N.A.: Not Available.

1/ 93,929,000 tons (includes 49,538 tons consumed for production of process steam).
2/ Data for fiscal year ended June 30, 1967.
3/ Includes equivalent for relatively small quantities of other fuels.
4/ Includes 1/2 of total coal consumed (648,000 tons) by Beach Bottom Power Co., owned 50% by Ohio Power Co. of American Electric Power and 50% by a non-affiliated utility company.
5/ Owned 37.8% by American Electric Power. All coal purchasing for OVEC is handled by AEP.

Total Company Capacity (Mw)	1967 Coal[a] Consumption (1,000 tons)				Consumption (Col. 10) as % of Total Utility Consumption in Midwest States 1/
	In Midwest States	In Other States	Total Consumption of Company in Midwest States (Total of Col. 8)	Total Company Consumption (9) + (10)	
(7)	(8)	(9)	(10)	(11)	(12)
	25				
263	610	-	746	746	0.79
	4				
	132				
55,317		24,926	84,861	109,787	90.34%

ectric Power and

RANKING TWENTY COAL* PURCHASING UTILITIES WITH GENERATING STATIONS IN THE MIDWEST STATES, 1967
(RANKED BY COAL* CONSUMPTION IN THE MIDWEST STATES) (CONTINUED)

6/ Included in total for American Electric Power.
7/ Classified by Federal Power Commission as a "small plant" (less than 25,000 kw of installed capacity. Consumption data were estimated by source on the basis of available generating statistics.
8/ Year shown refers to year of completion of last unit added. Initial year of plant operation not available.
9/ Includes 49,538 tons consumed for production of process steam.

Source: (Col. 1-4, 6 and 8-10): National Coal Association, Steam-Electric Plant Factors, 1968 Edition (Washington, D. C.: National Coal Association, 1968), Table 1 and Table 2.

(Col. 2): Moody's Investors Service, Moody's Public Utility Manual, 1968 (New York: Moody's Investors Service, 1968).

(Col. 5): Federal Power Commission, Steam-Electric Plant Construction Cost and Annual Production Expenses, 1967 Supplement.

Moody's Investors Service, Moody's Public Utility Manual, 1968 (New York: Moody's Investors Service, 1968).

(Col. 7): Federal Power Commission, Statistics of Privately Owned Electric Utilities in the United States, 1967, Section VII.

Federal Power Commission, Statistics of Publicly Owned Electric Utilities in the United States, 1967.

Rural Electrification Administration, 1967 Annual Statistical Report, p. 257.

TABLE XXXI

SELECTED STATISTICS[1/] ON THE TWENTY LARGEST UTILITY COMPANIES IN THE MIDWEST STATES (RANKED BY 1967 COAL CONSUMPTION)

Rank	Company	Coal Consumption in the Midwest States	Total Generating Capacity	Total Assets	Gross Operating Revenues
		(1,000 tons)	(Mw)	------($ Million)------	
(1)	(2)	(3)	(4)	(5)	(6)
1	Tennessee Valley Authority [2/]	19,930	15,973	$ 2,917	$ 351
2	Commonwealth Edison Co.	17,465	9,153	2,403	711
3	American Electric Power Co.	8,539 [3/]	9,307	2,156 [4/]	524 [4/ 5/]
4	Union Electric Co.	4,303	3,118	1,022	240
5	Wisconsin Electric Power Co.	4,207	2,567	705	213
6	Public Service Co. of Indiana	3,892	1,664	551	144 [6/]
7	Electric Energy, Inc.	3,548	1,100	117	32
8	Illinois Power Co.	3,185	1,394	578	177
9	Central Illinois Public Service Co.	2,903	1,072	345	99
10	Northern States Power Co.	2,437	2,217	926	271 [7/]
11	Indianapolis Power & Light Co.	2,159	1,101	288	81
12	Kansas City Power & Light Co.	1,989	1,209	366	95
13	Northern Indiana Public Service Co.	1,969	871	760	226
14	Louisville Gas & Electric Co.	1,929	1,253	279	98
15	Wisconsin Power & Light Co.	1,340	643	232	77
16	Central Illinois Light Co.	1,205 [8/]	523	238	69
17	Kentucky Utilities Co.	1,108	762	218	65
18	Wisconsin Public Service Corp.	1,058	607	211	74
19	Minnesota Power & Light Co.	949	520	147	44
20	Dairyland Power Cooperative	746	263	116	15
TOTAL		84,861	55,317	$14,575	$3,606

SELECTED STATISTICS[1/] ON THE TWENTY LARGEST UTILITY COMPANIES IN THE MIDWEST STATES (RANKED BY 1967 COAL[*] CONSUMPTION) (CONTINUED)

[*] Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Data includes all subsidiaries on a consolidated basis, except where otherwise noted.
2/ Data for fiscal year ended June 30, 1967.
3/ Includes 3,753,000 tons consumed by Indiana-Kentucky Electric Corp., a subsidiary of Ohio Valley Electric Corp. (owned 37.8% by AEP). All coal purchasing for OVEC is handled by AEP.
4/ Excludes Michigan Gas and Electric Co. Accounts for 1967 not consolidated pending sale of gas properties of Michigan Gas & Electric.
5/ Listed in source as "Operating Revenues (Electric)."
6/ Listed in source as "Total Operating Revenues (All Electric)."
7/ Listed in source as "Total Gross Earnings."
8/ Includes 49,538 tons consumed for production of process steam.

Source: (Cols.1 & 3): National Coal Association, Steam-Electric Plant Factors, 1968 Edition (Washington, D.C.: National Coal Association, 1968), Table 1.

(Cols. 2, 5, & 6): Moody's Investors Service, Moody's Public Utility Manual, 1968 (New York: Moody's Investors Service, 1968).

(Col. 4): Federal Power Commission, Statistics of Privately Owned Electric Utilities in the United States, 1967, Section VII.

Federal Power Commission, Statistics of Publicly Owned Electric Utilities in the United States, 1967, p. 73a.

Rural Electrification Administration, 1967 Annual Statistical Report, p. 257.

TABLE XXXII

ELECTRIC UTILITY COAL* CONSUMPTION IN THE MIDWEST STATES, 1967

State	1967 Utility Coal* Consumption (1,000 tons)
(1)	(2)
Illinois	28,295 1/
Iowa	3,025 2/
Indiana	19,120
Kentucky	12,990
Minnesota	4,244
Missouri	6,463
Tennessee	11,893
Wisconsin	7,899
TOTAL	93,929

* Coverage includes bituminous, sub-bituminous and lignite, as in Bureau of Mines statistics.

1/ Includes 49,538 tons consumed for production of process steam.

2/ Includes 75,700 tons consumed for purposes other than electrical generation.

Source: National Coal Association, Steam-Electric Plant Factors, 1968 Edition (Washington, D. C.: National Coal Association, 1968), Table 1.

VITA AND BIBLIOGRAPHY

Bruce C. Netschert
Director, Washington Office
National Economic Research Associates, Inc.

Education

B. A. (Geology), Cornell University, 1941
Ph. D. (Economics), Cornell University, 1949

Experience

1949-50 - Asst. Prof., University of Minnesota at Duluth

1951 - Commodity-Industry Analyst, U. S. Bureau of Mines

1951-52 - Staff member, President's Materials Policy Commission (prepared supply forecasts to 1975 for copper, lead, zinc, tin and rubber)

1953-54 - Consultant, Materials Area, National Security Resources Board and successor agency, Office of Defense Mobilization (assisted in formulation of stockpile and mineral industry mobilization policy)

1954-55 - Central Intelligence Agency (Branch Chief, nonferrous metals and nonmetallic minerals)

1955-61 - Senior Research Associate, Resources for the Future, Inc. (conducted research on the future supply of fuels and energy sources, including nuclear energy and solar energy, and the future supply of the major metals)

1961- - Director, Washington Office, National Economic Research Associates, Inc. (conduct and supervise research on a wide variety of subjects, with emphasis on national, regional and local supply-demand position of fuels and energy resources for various future periods; testify as expert witness on these subjects before state and federal courts, regulatory agencies and Congressional and Departmental hearings)

Professional Associations

Member, American Economic Association and American Institute of Mining, Metallurgical and Petroleum Engineers (former Chairman, Council of Mineral Economics in latter organization); Fellow, Geological Society of America; Fellow, Institute of Petroleum

Honorary Associations and Awards

Phi Beta Kappa; Phi Kappa Phi; 1961 Recognition Award, Texas Independent Producers and Royalty Owners' Association, for contribution to Energy in the American Economy (see bibliography)

Other Professional Activities

Frequent speaker and lecturer at professional and trade association meetings and at seminars and symposia at various universities and colleges.

Bibliography

Books:

Atomic Energy Applications with Reference to Underdeveloped Countries (with S.H. Schurr), 1957

General Geography for Colleges (with O.D. von Engeln), 1957

The Future Supply of Oil and Gas, 1958

Energy in the American Economy, 1850-1975 (with S.H. Schurr), 1960

The Future Supply of the Major Metals (with H. Landsberg), 1961

Articles and Book Chapters:

"Point Four and Mineral Raw Materials," Annals of the Association of American Geographers (June, 1951).

"Outlook in Lead," Mining Congress Journal (March, 1953)

"Economic Outlook on Coal, Oil and Natural Gas," Independent Petroleum Association of America Monthly (November, 1959)

"The Future of Hydropower Through 1975," Electric Power in Relation to the Nation's Water Resources, Committee Print No. 10, Select Committee on National Water Resources, U.S. Senate, 86th Congress, 2nd Session, (January, 1960)

"The Strategic Stockpile: A Materials Hoard -- For What?" Challenge, (May, 1960)

"World Resources for the Future," Pennsylvania Business Review (November, 1960)

"Technology Will Cope with Resources Deterioration," The Commerical and Financial Chronicle, (April 13, 1961)

"Energy Resource Evaluation," Latin American Electric Power Seminar of the Economic Commission for Latin America, Mexico City, July 31-August 12, 1961.

"New Sources of Energy in the World Energy Economy," Proceedings of the United Nations Conference on New Sources of Energy, (1961) (with G.O.G. Löf)

"Price and Supply Trends for Gas, Oil and Coal," The Commercial and Financial Chronicle, (December 28, 1961)

"Natural Gas Price Outlook," The Commerical and Financial Chronicle, (July 12, 1962)

"Economic Aspects of Natural Gas Supply," Economics of the Gas Industry, (1962)

nera

"The Strategic Stockpile - Hindsight and Foresight," Colorado School of Mines Quarterly, Volume 58, No. 1, Part II, (January, 1963)

"Growth and Changes Confronting the Gas Industry in the Long Run," The Commercial and Financial Chronicle, (March 21, 1963)

"Fuels and Power," Encyclopedia Britannica Book of the Year (1963)

"Interfuel Competition and Emerging Energy Markets," The Commercial and Financial Chronicle, (September 24, 1964)

"Energy Developments in the Next Decade and the Future of Appalachia," Extension Reader Series No. 80, West Virginia Center for Appalachian Studies and Development, (October, 1964)

"Natural Gas Price Regulation: The Consumer Viewpoint," Public Utilities Fortnightly, (October 8, 1964)

"Fuels and Power," Encyclopedia Britannica Book of the Year, (1964)

"World Energy Resources and Problems," Publication No. L66-53, Industrial College of the Armed Forces, 1965-1966

"The Area Pricing Concept as a Means of Regulating Natural Gas Field Prices," Proceedings, Council of Economics, American Institute of Mining, Metallurgical and Petroleum Engineers, (1966)

"Fuels and Power," Encyclopedia Britannica Book of the Year, (1966)

"Fossil Fuels and U. S. Strength," Publication No. L67-32, Industrial College of the Armed Forces, 1966-1967

"Developing the Energy Inheritance," Technology in Western Civilization, Volume II, (1967)

"Electric Power and Economic Development," The Economic Impact of TVA, (1967)

"Current Developments in the Energy Industries," Commercial and Financial Chronicle, (October 26, 1967) (with A. Gerber)

"Hot War in the Energy Industry," Harvard Business Review, (November-December, 1967) (with I. M. Stelzer)

"Fuels and Power," Encyclopedia Britannica Book of the Year, (1967)

"Myths About Shale Oil Industry and a Realistic View of its Prospects," Commercial and Financial Chronicle, (March 28, 1968)

nverra

"The Energy Outlook for the United States," 1968 World Power Conference (with A. Gerber)

"Fuels and Power," Encyclopedia Britannica Book of the Year (1968) (in press)

"The Technology of Energy Use in the Year 2000," Public Utilities Fortnightly, (April 10, 1969)

"Anti Pollution Technology: The Electric Car," Bulletin of the Atomic Scientists, (April, 1969, p. 37)

"Energy and Economics," Proceedings of a Conference sponsored by the Committee on Environment, Edison Electric Institute, (1969)

"Economic Trade-offs in Air Pollution Abatement," Bulletin, American Physical Society (in press)

"Competition in the Nuclear Supply Industry: A Review" Antitrust Bulletin (in press)

DEFENDANT'S
EXHIBIT
86

Report

STRUCTURE AND GEOGRAPHY OF THE ELECTRIC UTILITY MARKET FOR COAL

by: Abraham Gerber

STRUCTURE AND GEOGRAPHY OF THE ELECTRIC UTILITY MARKET FOR COAL

A. Coal is often mistakenly thought of by the layman as a homogeneous fungible product. In fact, coal is a product with a wide range of diversity in its chemical and physical properties which must be thoroughly understood and carefully evaluated by those who buy and use coal.

Coals vary widely in their sulfur content, ash content, volatility, fusion temperature, grindability and Btu content, all of which are significant in determining whether a given coal is technically and/or economically usable in modern sophisticated electric utility boilers.

Although coal with any given set of physical and chemical characteristics can be burned in a boiler designed to do so, once a boiler is constructed, it is limited within a fairly narrow range to the use of the coal with those properties for which it has been designed. Apart from the physical limitation on the ability to burn coals that differ in their chemical and physical characteristics from the coal for which the boiler was originally designed, substantial departures from those characteristics can also have significant economic effects. For example, a lower BTU content could require the transportation of larger tonnages than was originally anticipated and a higher ash content could materially increase the cost of ash handling and/or boiler maintenance.

By far the largest market for coal both present and future in the states of the Midwest and nationally is the electric power generation market. This market also represents the only significant growth market for coal. It also exemplifies most clearly the factors that must be considered in arranging for coal supply.

B. Because of the need to assure a supply of coal that satisfies the physical and chemical requirements of the equipment designed, the complexities of administering multiple coal contracts and the development of large-scale transportation arrangements with their attendant economies, coal supply for large power plants is likely to be developed with few (two or three) producers. Indeed, many plants are supplied by only a single producer from a single mine opened specifically to serve that single facility.

In considering whether a particular coal mine can compete for the business of a power plant, several factors must be weighed. These include the cost of coal at the mine (this could vary widely for a number of reasons most important of which is the difference between deep and strip mining costs), the location of the mine relative to the consumer and the transportation costs involved, the Btu content of the coal and the suitability of the physical and chemical properties of the coal produced by a given mine for the power plant facility.

1. The Trend Toward Long-Term Contracts

In recent years, there has been a growing trend toward long-term contractual commitments to meet the coal requirements of a particular electric power generating plant. The increasing size of electric power generating units and plants has been accompanied by an increase in the quantity of coal required. A modern large coal-fired generating unit of a thousand Megawatts capacity may cost as much as 150 to 200 million dollars. This major investment can be jeopardized by a disruption in the supply of coal. Utilities are, therefore, concerned with assuring the supply of coal to such a plant over its life. A unit of this size would require approximately 2-1/2 million tons of coal annually or about 75 million tons of coal over its 30-year life. A plant containing three such units (a size likely to become increasingly commonplace) would, therefore require a total of committed minable reserves of well over 200 million tons. Furthermore prior to determining the type of fuel and the plant location, the utility makes every effort to arrive at a reasonably firm estimate of fuel costs for the life of the plant. Once the plant decision is made as to fuel and location, the utility will firm up the fuel cost estimates with long-term contractual commitments.

Prior to construction of the power plant, therefore, the utility will typically arrange long-term contracts for all or at least a major portion of the total fuel requirements of the plant. In doing so, it will not only seek the lowest possible price per Btu of delivered coal, it

will also seek assurance of the coal supplier's capability of providing the required quantities of coal over a long period of time. Utilities are, therefore, concerned about the reliability of the coal supplier and his past record of performance in satisfying contractual commitments. It will weigh heavily its previous experience with potential suppliers and will carefully investigate the availability of adequate reserves within the supplier's control to satisfy the contractual commitments. The utility will seek independent geological verification of the existence and size of the coal reserve and the physical and chemical properties of the coal. These are given careful review since the coal-burning equipment will be designed to handle the type of coal that is to be made available. The coal supply is arranged for prior to the construction of a plant and the location and design of a plant are frequently determined by the coal supply arrangements that can be made.

The long-term contractual commitments are not only desirable from the consumer's standpoint, but are also necessary from the viewpoint of the coal supplier. Such commitments generally require the development of new mining capacity. As a rule of thumb, a mine capable of producing a million tons of coal requires an investment of between six to ten million dollars. Coal producers have been reluctant to invest in new mining capacity in the absence of long-term contractual commitments for the major portion of the mine's capacity. Furthermore, obtaining

financial resources to develop new capacity often requires long-term contractual commitments.

In the electric utility market competition is not continuous in the sense that competitors may seek to serve this business on a daily, monthly or even annual basis. Rather, competition tends to be a one time thing. While competition may exist initially to supply the coal requirements of a particular electric generating plant, once the initial coal purchase is made, competition to satisfy the coal requirements of the plant is precluded for an extended period of time amounting to as much as 15 years or even the full 30-year life of the plant. Prior to the awarding of the coal supply contracts, several producers could be in competition to supply the coal requirements but once the coal contracts are awarded, competition is foreclosed.

2. Mine-Mouth Plants

When the electric generating plant is located in close proximity to the coal supply (such plants are often referred to as mine-mouth plants), assurance of the availability of an adequate coal reserve in the adjacent mining property to meet the lifetime requirements of the plant becomes even more critical. In the case of mine-mouth plants, it is often extremely difficult to arrange for an economically satisfactory alternative supply of coal should the original supplier be unable to meet the plant's requirements. In the case of a plant located so close to the mine, coal may be delivered directly from the mine to the power plant

on a conveyor belt, and the plant itself is likely to be built with no alternative coal receiving facilities. A new source of coal supply, therefore, would result in a substantial increase in cost.

3. Transportation

Where an electric generating plant is more remotely located from the source of coal, transportation costs impose limitations on competition. The cost of transportation is, in such cases a major component of the delivered cost of fuel so that differences in freight rates significantly affect the competitive position of any mine vis-a-vis a particular consuming facility. Furthermore, coal handling facilities at the consuming plant are often limited to serve only one form of transportation. For example, facilities may be provided for only barge delivery so that mines with no economic access to river transportation would be competitively foreclosed. Truck transportation is of little relevance in the case of the large modern generating units since it is only useful for relatively short distances and small tonnages. At the same time the more remote the plant from sources of coal the wider the choice among alternative suppliers under given cost conditions. Nevertheless, the availability of economic transportation and especially possibilities for single-line haul under volume or unit train arrangements, will have a major impact on the competitive alternatives. In such cases, the coal transportation costs may be affected more by rail movement patterns than by mere distance, and these differences in

transportation costs can readily outweigh the differences in mine prices. In other words, a mine may be foreclosed from competition by transportation elements beyond the coal producer's control.

While prior to the construction of electric power generating facilities, competition is broader than after plant construction and several potential suppliers may compete for the location of the power plant in an area that would make their own coal supply most advantageous, even this competition is limited by the needs of the electric power system and the power plant itself. The power plant requires large quantities of water for cooling purposes and a sufficiently large site not only for the plant itself, but also for coal storage and ash storage. In addition, the cost of transmission and system requirements with respect to voltage control and reliability must also be considered.

Thus, competition among mines for the location of a given power plant is limited by the combined effect of all these factors. Any determination of which mines can compete for the coal requirements of a particular facility must be based on the specific facts pertinent to that plant and the mines involved.

4. The Limited Spot Market for Coal

The trend toward long-term contractual commitments to meet the total requirements of a particular electric power generating plant has tended to eliminate, even though it has not eliminated altogether, the spot market for coal. From time to time, a utility consumer may

purchase small quantities of coal on the spot market and long-term contracts are often written to permit some flexibility for these and other purposes. However, because utilities are increasingly arranging for bulk transportation of coal supply on a long-term basis, the opportunities for spot purchases are declining except in those few cases in which small mines may be located in such proximity to make them capable of providing some relatively small deliveries at low cost.

The cost advantages of train-load deliveries compared with rail rates for car-load deliveries are such as to limit the desirability of such spot purchases. Furthermore, the growing practice of the coal producers of expanding mine capacity only to meet the long-term contractual commitments, and the gradual disappearance of the very small truck mines has tended to limit the production capacity available for spot sales.

C. Current production figures do not provide an adequate measure of a coal producer's market power. Because a major market for coal is the electric power generating market and long-term supply assurance is required, the critical determinant of whether a coal company is capable of offering effective competition as a coal supplier is the level of uncommitted coal reserves under its control. Current production reflects past commitments of coal reserves and these cannot be sold a second time. Additional sales for substantial quantities cannot be made without the existence of a verifiable uncommitted reserve within the coal producer's control.

In view of the factors noted above, as well as the respective reserve positions of United Electric and Freeman, the degree of potential competition that did or could have existed in the past between the two companies was within narrowly circumscribed limits. As to the future, United Electric's ability to compete with Freeman, or indeed, any other Midwestern coal producer, is severely impaired, if not totally vitiated, by its lack of uncommitted reserves.

The resources of United Electric Coal Company that are presently uncommitted to long-term contracts are smaller than the quantities necessary to satisfy the requirements of a major new electric generating unit. Unless continuity of supply can in some way be assured by the reserves available to Freeman Coal, the small uncommitted reserves of United Electric Coal Company would not be considered as a significant source of supply for a large electric generating unit.

AVERAGE SIZE OF STEAM-ELECTRIC GENERATING PLANTS AND NEW UNITS 1/ UNITED STATES 1938, 1947 AND 1951-1966

Year	Average Size	
	New Units	Plants in Use
	--------(Megawatts)--------	
	(1)	(2)
1938	33	102
1947	39	118
1951	60	131
1952	66	139
1953	68	144
1954	86	154
1955	105	167
1956	119	176
1957	98	185
1958	110	197
1959	153	213
1960	158	230
1961	190	252
1962	201	281
1963	221	291
1964	220	311
1965	283	331
1966 2/	325	355

1/ As selected by the Federal Power Commission for inclusion in the annual statistical summaries (which did not include Rural Electric Cooperatives prior to 1966). In 1965, the number of plants (501) included in the summary accounted for 88 per cent of the contiguous U.S. electric utility industry's installed conventional steam-electric generating capacity of 188,213 Megawatts and for 93 per cent of the total net generation; figures for 1966 cannot be similarly compared because the effect of inclusion of the Cooperatives cannot be accurately measured in previous years.

2/ Excluding Rural Electric Cooperatives reported for the first time in 1966, when they accounted for 25 plants of 83-Megawatt average size and ten new units of 106-Megawatt average size.

AVERAGE SIZE OF STEAM-ELECTRIC
GENERATING PLANTS AND NEW UNITS 1/
UNITED STATES
1938, 1947 AND 1951-1966
(CONTINUED)

Source: Federal Power Commission, Steam-Electric Plant Construction Cost and Annual Production Expenses, various years.

REFERENCES

Babcock & Wilcox Co., "Steam, Its Generation and Use," 1963, Chapters 2, 4, 17, 18.

Blauvelt, H. W., "The Future of Coal as a Major Source of Energy," Speech before Houston Chapter of American Petroleum Institute, Houston, Texas, November 7, 1967.

Bouton, G. W., "1300 Mw Units at TVA Leads the Way for Tomorrow's 2000 Mw Units," Proceedings of the American Power Conference, Vol. 30, 1968, p. 383.

Coal Age, February, 1966, p. 50; March, 1966, p. 47; May, 1966, p. 45; October, 1966, p. 70, November, 1966, pp. 46 and 106, December, 1966, p. 50; February, 1967, pp. 46-48; April, 1967, p. 56; May, 1967, p. 55; July, 1967, pp. 50 and 56; August, 1967, p. 36; November, 1967, pp. 4 and 48; January, 1968, pp. 56 and 76-80; October, 1968, p. ; November, 1968, p. 52; December, 1968, pp. 43-44.

Duzy, A. F., "Lignite for Station Fuel Needs Mine to Boiler Care," Electrical World, July 24, 1967, pp. 45-49.

"Energy R&D and National Progress," U.S. Government Printing Office, 1964, p. 226.

Federal Power Commission, National Power Survey, 2 Volumes, USGPO, Washington, 1962.

Forsythe, J. R., "Over Half U.S. Generation to Burn Coal Through 1980," Electrical World, June 24, 1968, pp. 29-31.

Gerber, A. "Air Pollution and the Use of Low Sulfur Coal," New York: National Economic Research Associates, Inc., July 28, 1968.

Gerber, A. and Netschert, B., "The Energy Outlook for the U.S.," IEEE Spectrum, June, 1969, pp. 38-45.

Gorzegno, W. P. and Donahue, R. F., "800 Mw Expansion at Big Sandy Plant on the AEP System - Steam Generator Design, Fabrication, and Construction," Proceedings of the American Power Conference, Vol. 30, 1968, p. 499.

Griffin, E. M. and Profita, G. D., "Design and Construction of the Steam Generator and Related Equipment," Proceedings of the American Power Conference, Vol. 27, 1965, p. 571.

Hamilton, T. B., Knust, R. B., and Hensel, R. P., "Large Steam Generator Design as Influenced by Low Rank Coals," Proceedings of the American Power Conference, Vol. 30, 1968, p. 394.

Higgins, R. E., and Wynot, W. A., "An Application of the Revised Power Test Code for Steam Generating Units," Proceedings of the American Power Conference, Vol. 30, 1968, p. 425.

Journal of Commerce, "Coal Producers Planning to Expand," December 3, 1968.

Miller, C. A. and Kilflat, T., "Coffeen Station - A Mine-Mouth Plant on a Manmade Lake; General Description of Coffeen Station," Proceedings of the American Power Conference, Vol. 27, 1965, p. 540.

Moore, J. C., "The Future Role of Fossil Fuels in Electric Power Generation," Proceedings of the American Power Conference, Vol. 30, 1968, p. 38.

National Fuels and Energy Study Group, Report to the Committee on Interior and Insular Affairs, U.S. Senate, September 21, 1962, USGPO, Washington, 1962.

Olmstead, L. M., Ed., "9th Steam Station Design Survey," Electrical World, October 17, 1966, pp. 97-101.

Olmstead, L. M., Ed., "10th Steam Station Design Survey," Electrical World, October 21, 1968, pp. 83-87.

Pirsh, E. A., Rusanowski, N. P., and Young, W. W., "An Appraisal of Air Pollution in the Power Industry," Proceedings of the American Power Conference, Vol. 30, 1968, p. 106.

Ramsdell, R. G., Jr., "Design Criteria for Precipitators for Modern Central Station Power Plants," Proceedings of the American Power Conference, Vol. 30, 1968, p. 444.

South Central Regional Advisory Committee, "Electric Power in the South Central Region, 1970-1980-1990," Report to the Federal Power Commission, February, 1969, pp. 19-20.

Sporn, P., Vistas in Electric Power, Vol. 1, Fuel Supply, p. 209, Vol. 2, Superposition and Hydrogen Cooling for Logan, p. 346, Windsor Modernization, p. 350, Cardinal - A Supercritical Supersized Steam Plant Jointly Owned with Cooperative, p. 445, Pergamon Press.

Tillinghast, J., Pechstein, R., and Morgan, W., "Third Generation Supercritical Plant - Startup and Operating Experience at Farmer's Creek Unit No. 4," Proceedings of the American Power Conference, Vol. 25, 1968, p. 591.

West Central Regional Advisory Committee, "West Central Region Power Survey, 1970-1990," Report to the Federal Power Commission, pp. II-3, II-4, II-9, III-7.

ABRAHAM GERBER

Abraham Gerber was born in New York in 1925. He received his bachelor of arts degree from Columbia College in 1948 and a master's degree from Columbia University in 1950, after which he attended the New School for Social Research for a year on a graduate scholarship.

In 1951 Mr. Gerber joined the Department of Commerce Office of Business Economics in the Input-Output Section. Shortly thereafter he joined the Bureau of Mines of the Department of the Interior, where he headed the Energy Section in the Input-Output Group of the Office of the Chief Economist.

In 1953 Mr. Gerber joined the American Electric Power Service Corporation and was appointed Administrative Assistant to the President of American Electric Power Company.

In 1961 he was appointed Secretary of the newly established System Development Committee, a committee of the Board of Directors charged with the responsibility for exploring new areas in the technical and economic development of the AEP System in all phases of its activities including such technical developments as magnetohydrodynamics research programs, nuclear power, extra-high-voltage transmission, fuel resource development, and electric transportation. He continued to do research in fuel and energy with particular emphasis on the economics

of nuclear power and the competitive relationship between nuclear power and fossil fuels as sources of electric energy generation. He also continued to provide economic projections and load forecasts for planning electric power facilities on the American Electric Power System and to provide the President of American Electric Power Company with data and analytical material on economic matters.

Mr. Gerber served as consultant to President Eisenhower's Cabinet Committee on Energy in 1953, as Secretary of the Subcommittee on Energy and Raw Materials Resources of the Engineers Joint Council Engineering Research Committee in 1961-1962, as a member of the Technical Advisory Committee of the Office of Coal Research from 1961 to the present, as a member of the Fuels Special Technical Advisory Committee of the Federal Power Commission National Power Survey in 1962-1964, and has worked closely with the Appalachian Regional Commission. He authored a technical paper and served as a reviewer of technical papers for the recent Interdepartmental Energy Study of the Federal Government.

Mr. Gerber has written numerous articles and research papers including: "The Outlook for Uranium," with John Hogerton and Leonard Geller; "The Impact of Air Pollution Control on the Economics of Energy Supply," presented at the American Power Conference in April 1965; and "Soviets Find Capital Costs Make Hydro Less Economical," with Philip Sporn for Electrical World. He recently co-authored a paper

entitled "The Social-Economic Evaluation of Water Resource Projects," presented before the International Conference on Water for Peace last May.

Mr. Gerber also has lectured before a graduate seminar on nuclear power at Massachusetts Institute of Technology.

DX 87

COAL RESERVES AND DEEP MINING

REPORT BY PAUL WEIR COMPANY

GENERAL DYNAMICS, ET AL.

vs.

UNITED STATES

Paul Weir Company
Chicago, Illinois

Job No. 1583
July, 1969

Table of Contents

	Page
Analysis of Strip-Mining Potential of Specific Coal Fields	
Industry Field	1.
South of the Industry Field, Toward the Town of Rushville, Illinois	2.
Augusta Field, Located Approximately Ten Miles West of the Industry Field	5.
Meredosia-Mount Sterling Area, Located in Brown County, Illinois	6.
Ripley-Mount Sterling Area, Located in Brown County, Illinois	9.
Meredosia Area, in Morgan and Scott Counties, Illinois	9.
Spring Lake Township Area, Tazewell County	11.
Salt Fork Field, Located Near Catlin, Illinois	12.
Fidelity Mine Deep Coal	14.
Economics and Reserve Position Bituminous Coal Mining Illinois, Indiana and West Kentucky	16.
Ability of United Electric to Undertake Successful Deep Coal Mining	19.
	28.

Tables

1. Coal Mine Production.
2. New Coal Mines Placed in Operation or Announced Tri-State Area Illinois, Indiana, West Kentucky DEEP.
3. New Coal Mines Placed in Operation or Announced Tri-State Area Illinois, Indiana, West Kentucky STRIP.
4. SUMMARY New Coal Mines Illinois, Indiana, West Kentucky.

5a)
5b) Economic Study of Midwestern Strip Mining Mines
5c) Producing 2,000,000 Tons Annually.

Appendix

Letter by Mr. Paul Weir dated July 12, 1967.

Source Material Employed in Preparation of Report by Paul Weir Company.

PAUL WEIR COMPANY

COAL RESERVES AND DEEP MINING
REPORT BY PAUL WEIR COMPANY
GENERAL DYNAMICS, ET AL.
vs.
UNITED STATES

Analysis of Strip-Mining Potential of Specific Coal Fields

Based on engineering data made available to us by United Electric Coal Companies, a subsidiary of General Dynamics, and on our own specialized and general knowledge of coal characteristics on the Midwestern coal fields, we have made the studies deemed necessary by us to analyze the strip-mining potential of the following coal fields, as specified by the Government in their answer to Interrogatory 44 (although not in the same order):

1. Industry Field.

2. South of the Industry Field, toward the town of Rushville, Illinois.

3. Augusta Field, located approximately ten miles west of the Industry Field.

4. Meredosia-Mount Sterling area, located in Brown County, Illinois.

5. Spring Lake Township area, Tazewell County, located directly south of the Banner Mine across the Illinois River.

6. Salt Fork Field, located near Catlin, Illinois.

7. Fidelity Mine deep coal.

Industry Field

Coal Bed Location and Occurrence

The Industry Field is located largely in the southeastern portion of Township 4 North, Range 3 West (McDonough County), with short extensions into Township 4 North, Range 2 West (McDonough County) and Township 3 North, Range 3 West (Schuyler County). At these locations the Illinois No. 2 coal bed underlies portions of a comparatively flat upland known as Gin Ridge, outcropping on both sides of Grindstone Creek, on the northern side of the ridge, and on both sides of Willow Creek, on the southern side of the ridge. The actual coal outcrop is seldom exposed, but numerous local mines have been operated near the approximate lines of outcrop, with their individual areas of depletion being unknown. A number of drill holes put down by United Electric in their exploratory program encountered "old works".

Where not partially eroded or missing, the No. 2 bed generally ranges from 24 to 30 inches in thickness. It seldom occurs in its normal thickness under less than 25 feet of cover, usually being thinned or too soft to mine where the overburden is less than 25 feet in thickness. The coal bed undulates to some extent, being either higher or lower than its expected level of occurrence within fairly broad areas of irregular shape. It has been either eroded or was never deposited in a narrow, channel-shaped strip across the center of the property, although the horizon where the coal bed should occur is well below a cover thickness of 25 feet.

Estimated Reserves

There are approximately 3,686 coal acres within the surface properties controlled by United Electric, and approximately 1,587 additional coal acres in adjoining lands not controlled by the Company, but presumably obtainable should mining operations be contemplated. With a weighted average thickness of 28.26 inches within the United Electric properties and of 27.68 inches within the adjoining properties, the total reserves of raw coal in place before mining would be 15,625,000 tons and 6,589,200 tons, respectively. At an assumed overall recovery of 68 percent after mining and conventional cleaning, the recoverable merchantable reserves would be 10,625,000 tons from the properties controlled by United Electric, and 4,480,700 tons from the adjacent properties, a total of 15,105,700 tons.

Overburden Characteristics

The soft, unconsolidated surface material underlying Gin Ridge and the slopes of Grindstone and Willow Creeks usually ranges from 15 to 25 feet in thickness. The interval from the base of this soft material down to the coal bed commonly consists of a hard gray shale, frequently sandy, and occasionally containing a bed of hard sandstone. This sedimentary, consolidated material would have to be broken by blasting before removal by stripping equipment.

Overburden Ratios

With a weighted average thickness of overburden of 53.44 feet within the United Electric properties and of 58.83 feet within the adjoining properties, the ratios of cubic yards of overburden to ton of merchantable coal would be 29.91 and 33.62, respectively.

Quality

The available analyses of the coal bed within the United Electric properties indicate that Coal No. 2 in the Industry Field is approximately similar in quality to the No. 2 coal elsewhere in this area except that it is notably higher in sulfur content.

Conclusions

The Industry Field has been well drilled, so that the available information concerning its stripping characteristics and other attributes is specific and comprehensive. With reserves of somewhat irregular coal continuity and occurrence, and with high overburden ratios, together with no better than average quality, at best, we consider the strip-mining potential of this area as distinctly marginal. These reserves, in our opinion, would not be competitive in the foreseeable future with reserves now being mined or held for future operation elsewhere in Illinois, Indiana and West Kentucky.

South of the Industry Field, Toward the Town of Rushville, Illinois

Coal Bed Location and Occurrence

The specific areas of interest that pertain to the above heading of a coal field "South of the Industry Field Toward the Town of Rushville, Illinois", consist of two isolated tracts in Schuyler County in which United Electric obtained a few land properties which were drilled for exploratory purposes and then relinquished. One such tract is situated in Sections 15 and 14, Township 3 North, Range 3 West, one mile south of the southern margin of the Industry Field proper. The second such tract is contained within Sections 4, 8 and 9, Township 2 North, Range 2 West, approximately seven miles southeast of the first tract and five miles northwest of the town of Rushville.

There were 15 drill holes put down in and near the properties in Sections 15 and 14. Only two of these holes encountered the Illinois No. 2 coal bed at its proper horizon and normal thickness. The other drill holes were negative, and were either started below the horizon of the No. 2 coal or encountered No. 2 coal in less than full thickness.

There were 14 drill holes put down within and near the properties in Sections 4, 8 and 9, all of which were negative with the maximum coal thickness in any such holes being 19 inches. Most of these holes were sufficiently deep to indicate that the No. 2 coal horizon was definitely missing.

Conclusions

The region extending south and southeast of the Industry Field toward Rushville, Illinois, as indicated by the exploration work done by United Electric, is obviously unsuitable for further consideration for mining.

Augusta Field, Located Approximately Ten Miles West of the Industry Field

Coal Bed Location and Occurrence

The Augusta Field is located in Hancock and Schuyler Counties immediately south of the town of Augusta, approximately ten miles southwest of the Industry Field. While this field lacks specific delineation it occupies southern portions of Ranges 6 West, 5 West and 4 West, all in Township 3 North, and major portions of Ranges 6 West, 5 West and 4 West, all in Township 2 North. Within this area the Illinois No. 2 coal bed intermittently underlies a broad upland area between westward-flowing headwaters of drainage systems flowing ultimately into the Mississippi River near Quincy and southeastward-flowing streams draining into the Illinois River. The eastern portion of the upland area is irregularly dissected by Williams and Cedar Creeks. While there has been local stripping in stream bottoms just south of the Augusta area, the actual coal outcrop is seldom exposed. Indications of local mine operations along the outcrop lines are relatively infrequent, suggesting difficulties in access or operation.

While ranging where present from 24 to as much as 34 inches in thickness, the general average thickness appears to be about 28 inches. The information available from drilling suggests that the coal bed is not uniformly present along the horizon where it should be encountered. It abruptly disappears under level uplands for irregular distances. It sometimes occurs on one side of a tributary stream but not on the other.

The No. 2 coal bed is occasionally underlain at a vertical interval of about 20 feet by a very irregular lower bed which appears to range from 14 to 24 inches in thickness. Analyses of this lower bed indicate abnormally high contents of ash and sulfur and this bed is not considered as any portion of the potentially strippable Augusta Field.

Estimated Reserves

Although the overall area is large, the amount of drilling is too insufficient, and the presence of areas of missing coal too strongly suggested, to permit any estimates of reserves. The apparent outcrop of the bed across the broad western portions of the field is very deep, with a cover thickness of approximately 50 feet where stripping would have to begin. In such areas the thickness of overburden increases rapidly to 75 and 100 feet.

Overburden Characteristics

The soft, unconsolidated material at the surface of the Augusta area is generally quite thin, ranging up to 20 feet in thickness but

generally averaging about 10 feet. The sedimentary strata between the base of this soft material down to the coal bed generally consist of a hard sandy shale, frequently containing one or more beds of hard sandstone ranging up to 15 feet in thickness. The stratified portion of the overburden above the coal would require relatively heavy blasting before removal by stripping equipment.

Overburden Ratios

While specific overburden ratios within the Augusta Field as a whole cannot be determined because of the lack of information on coalbed occurrence within the field, it is probable that it would be prevailingly high.

Quality

The available analyses of the coal bed within the Augusta Field indicate that the coal is generally similar in quality to that of No. 2 coal elsewhere in this area.

Conclusions

The Augusta Field has been but sparsely drilled, so that there is not sufficient information for determining its operating characteristics. With difficult overburden characteristics and high overburden ratios, together with no better than average quality, we consider the strip-mining potential of this area as inferior. The reserves, in our

opinion, would not be competitive in the foreseeable future with reserves now being mined or held for future operation elsewhere in Illinois, Indiana and West Kentucky.

Meredosia-Mount Sterling Area,
Located in Brown County, Illinois

The combination of place names in the above title is misleading in that the Mount Sterling (Ripley) area in Brown County is on the west side of the Illinois River while the Meredosia area is separately located a substantial distance south of Mount Sterling on the eastern side of the Illinois River in Morgan and Scott Counties.

Ripley-Mount Sterling Area,
Located in Brown County, Illinois

Coal Bed Location and Occurrence

The Ripley Field (Ripley being approximately six miles northeast of Mount Sterling) consists of scattered properties in the southern portion of Township 1 North, Range 2 West, north of Crooked Creek, and of a relatively small, compact area south of Crooked Creek in the southwestern corner of the same township. Both of these two separate areas are dissected by tributary channels flowing into Crooked Creek. There has been but little local mining in this field.

Where present, the No. 2 coal bed hovers around 24 inches in thickness. This coal is either quite erratic in occurrence or too deep to be considered as strippable in the properties north of Crooked Creek. While apparently uniform in occurrence south of the Creek the available area is small, with the coal bed not only being thin but going rapidly under deep cover south and west of the prospective area.

Estimated Reserves

The area north of Crooked Creek is too erratic in coal occurrence to permit any estimate of reserves. The small area south of the Creek contains approximately 2 million tons of recoverable coal but would have a high overburden ratio because of its relative thinness.

Overburden Characteristics

The soft surface material in the area south of Crooked Creek is generally thin so that the normal interval of sandy shale down to the top of the coal bed would have to be blasted prior to stripping.

Quality

The analysis of one drill core indicates that the No. 2 coal at Ripley is approximately similar in quality to No. 2 coal elsewhere in this field.

Conclusions

The area adjacent to the town of Ripley south of Crooked Creek has been well drilled, but with the thinness of the coal and high overburden ratio, and with its limited extent, we consider the strip-mining potential of this area as inferior. The reserves, in our opinion, would not be competitive in the foreseeable future with reserves now being mined or held for future operations elsewhere in Illinois, Indiana and West Kentucky.

Meredosia Area,
in Morgan and Scott Counties, Illinois

Coal Bed Location and Occurrence

The Meredosia field was explored over a considerable geographic area by conducting drilling operations in small, scattered properties located in Range 12 West, Township 16 North, Ranges 13 and 12 West, Township 15 North, and Ranges 13 and 12 West, Township 14 North. This overall area is approximately 16 miles north-south, and seven miles east-west in extent. The town of Meredosia is on the Illinois River, about five miles west of the northern portion of the explored area. The coal-bearing area occupies the upland facing the broad Illinois River valley which is heavily dissected by westward-flowing creeks and tributaries. Local mining operations are few and scattered, being located mainly in the deeper drainage valleys near small towns.

While probably present throughout the area, the No. 2 coal is prevailingly deep, ranging from 50 to 100 feet or more over broad areas. The coal bed ranges from 24 to 31 inches in normal thickness. The overburden generally consists of up to 75 feet of soil and glacial deposits, and the sedimentary strata between the bottom of the glacial deposits and the top of the coal bed commonly contain varying thicknesses of sandstone.

Conclusions

While the work done by United Electric in the Meredosia area was primarily of an exploratory nature, the results are sufficient to indicate that the area is not potentially strippable because of the prevailingly excessive depth of overburden.

Spring Lake Township Area, Tazewell County

Coal Bed Location and Occurrence

The portion of Spring Lake Township (Ranges 7 and 6 West, Township 24 North) designated as the Spring Lake Township Area is located in the essentially flat bottom lands comprising the Illinois River valley south of the channel of the Illinois River. The coal bed does not outcrop nor has it been mined in the vicinity of this area. It is being mined, however, north of the river in Townships 6 and 7 North, Ranges 5 and 6 East, by the United Electric Coal Companies at their Banner Mine.

The No. 2 coal bed south of the river in Spring Lake Township appears to be very limited in areal extent. The thickness of coal encountered in six drill holes ranged from 17 to 29 inches, with an average of 22 inches. Where it was found to be present, the bed underlies a veneer of water-bearing valley sediments approximately 20 feet in thickness, below which there is a hard gray shale, sometimes sandy, to the top of the coal bed. Elsewhere within the area explored, drilling encountered up to 48 feet of unconsolidated strata, suggesting that the coal bed does not uniformly underlie the valley floor but was either eroded or never deposited in irregular areas.

The amount of drilling is too insufficient, and the presence of areas of missing coal too strongly suggested, to permit any estimates of reserves.

Quality

The available analyses indicate that this coal is approximately similar in quality to No. 2 coal elsewhere in this field except that it is notably higher in sulfur content.

Conclusions

The Spring Lake Township area is too limited in extent, without any indications of potential expansion in total area, to suggest any possibilities of commercial operation.

Salt Fork Field,
Located Near Catlin, Illinois

Coal Bed Location and Occurrence

The Catlin Field is located largely in the south-central portion of Township 19 North, Range 12 West (Vermilion County), just northwest of the town of Catlin, which is approximately six miles southwest of the city of Danville, Illinois. At this location the Illinois No. 7 coal bed underlies a comparatively flat upland just south of Salt Fork at its confluence with the Vermilion River. Some of the earliest commercial strip mining in Illinois took place in the flat bottom lands of Salt Fork and Vermilion River. There is an active stripping operation on the north side of the Vermilion River approximately three miles west of Danville.

During and shortly after its exploration of the Catlin Field, United Electric also prospected the valley of Vermilion River approximately two miles north of the then northernmost limit of the old stripped-out area. A few drill holes were also put down in upland terrain approximately four miles west of Catlin.

The No. 7 coal bed under these three scattered areas ranges from 68 to 76 inches in thickness, with a general average of 6'0". It is persistent within the explored areas but lies under relatively high cover in all of the three areas thus tested.

Estimated Reserves

The drilling programs were too limited in extent to determine specific estimates of reserves, although the Catlin area is obviously large. The original United Electric Catlin Field, in fact, plus extensive areas east and west of this field, are now in the hands of another company, representing inactive reserves.

Overburden Characteristics and Ratios

The overburden strata, both in the river bottoms to the north, and in the upland areas south of Vermilion River, generally consist of relatively thin surface material underlain by shales, sandy shales and sandstones. Such overburden would have to be blasted before removal by stripping equipment. The thickness of overburden in the areas drilled was generally over 80 feet, ranging up to 110 feet in the Vermilion River flats, up to 120 feet in the Catlin area proper, and up to 165 feet in the area four miles west of Catlin. Overburden ratios would approximate 25:1 or more.

Quality

The No. 7 coal in the general Danville Area is slightly higher in ash and slightly lower in sulfur as compared with most other Illinois coals.

Conclusions

The Catlin Field is no longer available, but with its high overburden ratios, would be considered as distinctly marginal when compared with most coal reserves now being mined or held for future operations elsewhere in Illinois, Indiana and West Kentucky.

Fidelity Mine Deep Coal

Coal Bed Location and Occurrence

The Fidelity "Deep" area is located in the southeastern part of Section 27 and the eastern part of Section 28, Township 6 South, Range 2 West (Perry County), and in the northwestern corner of Section 2 and the northeastern corner of Section 3, Township 7 South, Range 2 West (Jackson County). Lying between what will eventually become the final limit of stripping of the Fidelity Mine at the approximate 85-foot cover line as its western boundary and the large Kathleen underground mine as its eastern boundary, the area is approximately 1.75 miles north-south and 0.625 miles east-west in extent.

The Illinois No. 6 coal in the Fidelity "Deep" area is persistent ranging from 66 to 110 inches in thickness.

Estimated Reserves

There are approximately 794 coal acres within the Fidelity "Deep" tract. With a weighted average thickness of 83.67 inches, the reserves of raw coal in place before mining would be 9,965,000 tons. At an

assumed overall recovery of 72 percent after mining and conventional cleaning, the recoverable merchantable reserves would be 7,175,000 tons.

Overburden Characteristics

The overburden commonly consists of up to 58 feet of unconsolidated surface and glacial material, below which the sedimentary strata consist of shales, sandy shales and occasionally sandstone. A persistent massive limestone bed, ranging from one to 14 feet in thickness and lying from 3 feet to 25 feet above the coal bed, is also included in the overburden. Such strata are difficult to handle and would require selective and heavy blasting before removal by stripping equipment.

Overburden Ratios

With a weighted average overburden thickness of 89.48 feet, the ratio of cubic yards of overburden to ton of merchantable coal would be 15.98:1.

Quality

While not specifically tested, the quality of the No. 6 coal in this area is considered to be essentially the same as that of the No. 6 coal being mined at the Fidelity Mine.

Conclusions

The Fidelity "Deep" field has been well drilled, so that the available information concerning its stripping characteristics is specific and comprehensive. With its difficult overburden characteristics and high overburden ratio, we consider that there is virtually no strip-mining potential for this area. It would be impossible to strip mine these coal reserves at a cost comparable to the coal production costs of the other stripping operations and reserves yet to be mined in the Belleville District.

Economics and Reserve Position
Bituminous Coal Mining
Illinois, Indiana and West Kentucky

For some time, strip mining has been providing an increasing share of coal output in the Tri-State Area. Table 1 shows annual production for the years 1949 through 1967 for strip mines, underground mines and all mines. The proportion mined by stripping has increased from 39.90 percent in 1949 to 64.94 percent in 1967. Production from underground mines declined from 60,461,000 tons in 1950 to 38,596,000 tons in 1961. Since that time, underground production has gradually increased to a level of 45,666,000 tons in 1967.

Bulletin 1252-C of the U. S. Geological Survey entitled "Stripping-Coal Resources of the United States" (1968), contained this summary of recent work by the Illinois Geological Survey:

". . . in 1955 the Illinois Geological Survey began a new program of study of stripping coal that has yielded five reports to date (Smith, 1957, 1958, 1961; Smith and Berggren, 1963; Reinertsen, 1964). On the basis of work completed and in progress, J. A. Simon (written commun., Sept. 28, 1966) has concluded that the remaining stripping-coal resources of Illinois as of January 1, 1966, in beds 18 inches or more thick and at a maximum depth of 150 feet, total 21,223 million tons. Simon also concluded that the original resources within the same parameters totaled about 23,000 million tons."

With a record of past growth and what might seem to be an assured resource base on which to build, it would appear that strip mining would continue its record of growth. Actually, estimates of strippable coal reserves of Illinois are misleading. Strippable coal as defined by the Illinois Geological Survey includes coal seams that are 18 inches or more thick with an overburden not more than 150-feet thick. A substantial proportion of the strippable reserves as thus defined are not economically recoverable as of the present time and may never be economically recoverable. In a paper entitled "An Evaluation of Illinois Coal Reserves Estimates," presented at the 76th Annual Meeting of the Illinois Mining Institute in Springfield, Illinois, October 25, 1968, by J. A. Simon and W. H. Smith of the Illinois Geological Survey, these comments were made:

> "Use of the words minable and strippable as applied to Illinois reserve studies, although defined in the studies, has been too often literally interpreted . . .. Some misuse of these data has been made."

The concluding remarks of the paper include this statement:

> "Although total remaining coal reserves of Illinois are considered to be conservative as defined (emphasis added) in studies to date, minable or strippable reserves based on these data will be much smaller (emphasis added) if defined by greater minimum thickness or modified by definitions of economic minability."

In a paper entitled "Coal Strip Mining - Is It Reaching A Peak?", by Hubert E. Risser, Assistant Chief and Principal Mineral Economist, Illinois Geological Survey, presented at the Fall Meeting of the Society of Mining Engineers in Minneapolis, Minnesota, September 18, 1968, the following summary was presented:

"For half a century the percentage of coal production provided through strip mining has steadily increased. Recent trends indicate that a peak in percentage, if not in tonnage, is being approached. Important among the reasons for this is the decline in economic advantage enjoyed by strip mining compared to underground mining. Among the factors contributing to this decline are the following:

"1. Decrease in the margin of advantage in manpower requirements held by strip mining.

"2. Increase in depth and volume of overburden necessitating larger equipment and investment of more capital.

"3. Increasing scarcity of reserve blocks of land big enough to support extensive mining operations.

"4. Increasingly stringent legislation for reclamation of stripped land and the resulting higher cost of reclamation.

"5. Increasing cost of land surface rights.

"In the eastern part of the United States there has already been a peaking and decline in the relative importance of strip mining in some major coal producing states. Although it is not clear at what point the pressures discussed above will cause a peaking for the region as a whole, the trends indicate that this definitely is on the way."

In order to give a perspective on trends in the Tri-State Area Tables 2, 3 and 4 present information on new coal mines which were placed in operation or announced during the period from 1959 to date. As shown in Table 2, which presents data on deep coal mines, the Orient No. 5 Mine of Freeman Coal Mining Corporation and Mine No. 21 of Old Ben Coal Corporation were placed in operation in 1959. After 1959, no new deep mines were developed until 1964. Since that time, 18 deep mines have been placed in operation or announced. As shown in Table 4, the total number of mines announced or placed in operation for the period was 20 mines having an approximate annual capacity of 44.5 million tons.

Table 3 presents similar information on strip coal mines. Since 1959, 16 new mines having an approximate annual capacity of 34.3 million tons have been placed in operation or announced. The most recent mine to be announced was the Leahy Mine of Ayrshire Collieries Corporation. This mine is in Perry County, Illinois, and will strip the reserves in the Denmark Field. These reserves are known in the industry as the last undeveloped major reserve of strippable coal in the Tri-

State Area and we doubt that any new comparable strip operations can be developed in the Tri-State Area.

We specifically point out the strip mines listed on Table 3 are based on coal reserves which had been in the hands of the operating company or precedessor companies for many years before development commenced. For example, the Denmark lands, on which the Ayrshire Collieries Corporation Leahy Mine will be developed, were assembled into a block in about 1927 by a predecessor company.

The summary shown on Table 4 does indicate the way in which underground coal production is increasingly supporting the growth in production in the Midwest. This trend must continue. In addition to the deep mines listed, we know of several underground operations which will definitely be developed but have not been announced. In contrast we know of no major strip mine which will be developed but has not been announced.

Counsel for defendants in United States v. General Dynamics, et al. have provided us with the following schedule of midwestern coal reserves controlled by producing companies (and excluding reserves controlled by Standard Oil Company (New Jersey) or affiliates):

Midwestern Coal Reserves Controlled by Producers
(Million Tons)

	Dedicated to Existing Mines	Other Reserves	Total
Strip	1,148	646	1,794
Deep	1,133	6,412	7,545
	2,281	7,058	9,339

In comparing these resource bases with the production of strip and deep coal in the Tri-State Area (84.6 million tons strip and 45.7 million tons deep, according to the most recent U. S. Bureau of Mines statistics), the index of remaining life for strip coal would be 21 years and for deep coal 165 years. Actually, of course, the production of any natural resource does not continue at a level rate and then cease. Over a period of time the plot of production will assume a bell-shaped curve with production increasing, gradually reaching a peak, and then declining. It is evident that reserves of strippable coal are limited in relation to the present level of production. For this reason we believe that peak production of strip coal will be reached within a very short time and a gradual decline will ensue thereafter. Meanwhile, there will be substantial growth in underground production. In 1980, we project that 75 percent of production in the Tri-State Area will come from deep mines.

An obvious question is whether additional strippable coal reserves can be found in the Tri-State Area to add to the relatively limited strip reserves shown in the above table.

The most important factor in determining whether coal reserves are economically recoverable by stripping is the overburden ratio; that is the cubic yards of overburden which must be removed to uncover a ton

of coal. Obviously, the reserves lying under shallower cover are the most attractive and are mined first. Overburden ratios for remaining reserves are increasing.

Tables 5a, 5b and 5c are presented to show the effect of overburden ratios and other factors affecting the economics of strip mining in the Midwest. The annual production assumed is 2,000,000 tons and four hypothetical mines are presented having overburden ratios of 12.6, 14.7, 19.6 and 25.2 cubic yards per ton. The life of each mine is assumed to be 20 years. It is assumed that for all four mines stripping equipment capable of digging to a maximum height of 100 feet is employed. The greater overburden ratio is assumed to be due to lesser coal thickness. As shown, the coal acres required vary from 5,128 acres for the 12.6 ratio to 10,417 acres for the 25.2 ratio. These are substantial areas in any case, and acquisition of blocks of such size is extremely difficult if not impossible. Even if lands of such size were available, land costs are steadily rising. For our studies we have assumed an average cost of $500 per acre. In many areas costs are as much as $800 to $1,000 per acre.

We assume that a single stripping shovel would uncover all of the overburden. The capacity of the stripping shovel varies from 90-cubic yards for the 12.6 ratio to 180-cubic yards for the 25.2 ratio. This is the largest stripping shovel which has yet been built. As can be seen from Table 5a, the cost of the stripping shovel is the major element of capital cost for a strip mine. The total initial investment for all plant and equipment and coal lands for the strip mines increases

from $6.39 per annual ton for the 12.6 ratio to $11.75 per annual ton for the 25.2 ratio.

Table 5b shows the estimated costs of production for the four hypothetical mines. The direct operating cost per yard of material moved is estimated to be 5.5 cents per cubic yard for the 90-cubic yard shovel and 5.0 cents per cubic yard for the 105-cubic yard shovel. The cost per yard for the 140- and 180-cubic yard shovels is assumed to also be 5.0 cents per cubic yard. The increased size of the shovels does not result in reduced costs per yard.

The total cost of production including depreciation and depletion increases from $2.836 for the 12.6 ratio to $4.128 for the 25.2 ratio. In order to place these costs in further perspective, we have calculated the sales realization which would be required to make the hypothetical mines attractive coal mine investments. We have assumed a rate of return of 12 percent on investment. The realization necessary on this basis varies from $3.635 for a 12.6 ratio to $5.721 for a 25.2 ratio. The detail on these calculations is shown on Table 5c. In 1967 the average values per ton for mines in Illinois, Indiana and West Kentucky were $3.88, $3.99 and $3.42, respectively.1/ From these data it can be seen that the prevailing level of sales realizations would not permit economically viable mining of coal at high overburden ratios. Under average conditions we would estimate a maximum economic ratio in the Tri-State Area as of the present time of about 18-cubic yards per ton.

1/ U. S. Bureau of Mines Minerals Yearbook, 1967.

There are, of course, instances where coal under somewhat heavier ratio can be mined economically because of overburden which does not require shooting and/or because of high sales realization due to favorable transportation arrangements.

The relationship shown between overburden ratio and sales realization necessary for an adequate return on investment is essentially linear. For each one point increase in ratio an additional 16.5 cents per ton in realization is necessary for an adequate return.

The investment required for underground mining is substantially less than for strip mining under heavy overburden. As of the present time, the investment per annual ton for an underground mine in the Tri-State Area approximates $5.00 to $6.00. This compares with investments per annual ton for the hypothetical strip mines of from $6.39 to $11.75. As overburden ratios increase, a point is reached where underground mining is cheaper than strip mining.

Commercial coal producers in Illinois, Indiana and West Kentucky have been faced for some time with a deteriorating strip reserve position. Reserves held by operating companies are inadequate to support a sufficient number of new mines which could produce at competitive costs. Such existing unassigned reserves are generally characterized by higher overburden ratios and smaller blocks of land often insufficient to support economic operations. Despite diligent search, operators have been unable to find economically strippable reserves not now controlled

by others.2/ It is clear that operators will not be able to replace strip mines being worked out, let alone attempt to supply any growth in coal demand. For the industry as a whole, and for specific companies, underground coal production must not only supply the growth in coal demand, but also replace strip production as strip mines are depleted.

Ability of United Electric to Undertake Successful Deep Coal Mining

The primary deterrent to initiating deep mining for any coal or non-coal company not already having a deep-mining organization is the crucial and critical shortage of miners, supervisors and technically-trained people. During the period subsequent to World War II, the coal industry suffered from declining markets and production. Not until 1960 did the growth in the primary market, electric utilities, offset loss of other markets. The image of the industry in the 1950's was sick. Mining schools were closed because of lack of students. Ohio State, Pittsburgh, Lehigh and the University of Illinois all closed their mining departments. It is almost inconceivable that Illinois, with the largest reserves of bituminous coal in the nation, does not offer a degree in mining engineering at the University. Because of the decline in the 1950's, few miners entered the industry. Presently, there are too many employees in the upper age brackets, ex-experienced but old, and too many in the lower age brackets, young and

2/ See our letter of July 12, 1967, attached hereto, the accuracy of which we reconfirm.

inexperienced. There are too few in between. Presently, many companies are resorting to training schools to get miners and supervisors.

Coal mining by deep methods is very specialized in comparison to surface mining. Surface mining is in many ways analagous to earth moving. Deep mining requires more expertise and expertise quite different and distinct from that required for strip mining. Deep mining also involves more risk. Generally, coal companies have relied on either strip mining or deep mining, not both. The exceptions to this have been companies of one primary type of mining which acquired or were merged with companies of the other primary type. For example, Consolidation Coal Company became both a strip-mining and deep-mining company through the merger of Pittsburgh Coal Company (deep), Christopher Coal Company (deep), Hanna Coal Company (deep and strip), Pocahontas Fuel Company (deep) and Truax-Traer Coal Company (strip). Peabody Coal Company became both strip and deep when the Sinclair Coal Company (strip) was merged into Peabody (deep). There has been a great reluctance on the part of the management of strip-mining companies to try deep mining.

In order to undertake deep mining United Electric would have had to acquire a deep-mining organization in spite of extreme shortage of competent personnel. Management would have had to accept responsibility not only for economically viable deep-mining projects, but for the safety of personnel. This latter requirement has particularly troubled managements oriented toward strip mining alone. While it is, of course,

impossible to state for certain whether or not United Electric would even have attempted to undertake deep mining, it is improbable that they could have done so successfully, and, therefore, highly unlikely that they would have tried. This would have been true even if United Electric had had the best deep-mining reserves to work with. We believe that the integration of control of United Electric and Freeman was a logical and desirable step for United Electric as a company with very limited strippable reserves and no deep-mining team.

Respectfully submitted,

PAUL WEIR COMPANY

By: J. P. Weir

J. P. Weir

TABLE 1 COAL MINE PRODUCTION
(Thousand Short Tons)

TABLE 1

	STRIP MINES				UNDERGROUND MINES				TOTAL MINES				PERCENT STRIP			
Year	Illinois	Indiana	West Kentucky	Total	Illinois	Indiana	West Kentucky	Total	Illinois	Indiana	West Kentucky	Total	Illinois	Indiana	West Kentucky	Total
1949	13,893	9,592	9,149	32,634	33,315	6,957	8,880	49,152	47,208	16,549	18,029	81,786	29.43	57.96	56.74	39.90
1950	17,612	10,740	11,467	39,819	38,678	9,217	12,566	60,461	56,290	19,957	24,033	100,280	31.29	53.82	47.71	39.71
1951	18,297	10,997	9,096	38,390	35,903	8,453	12,795	57,151	54,200	19,450	21,891	95,541	33.76	56.54	41.55	40.18
1952	16,705	9,773	8,845	35,323	29,085	6,577	12,336	47,998	45,790	17,350	21,181	84,321	36.48	56.33	41.76	41.89
1953	16,681	9,630	8,312	34,623	29,329	6,182	13,001	48,512	46,010	15,812	21,313	83,135	36.26	60.90	39.00	41.65
1954	16,454	8,513	9,606	34,573	25,517	4,887	12,844	43,248	41,971	13,400	22,450	77,821	39.74	63.53	42.79	44.43
1955	18,676	11,182	11,741	41,599	27,256	4,967	14,569	46,792	45,932	16,149	26,310	88,391	40.66	69.24	44.63	47.06
1956	19,675	11,914	14,400	45,989	28,427	5,175	15,142	48,744	48,102	17,089	29,542	94,733	40.90	69.72	48.74	48.44
1957	19,999	10,891	15,228	46,118	26,994	4,950	13,744	45,688	46,993	15,841	28,972	91,806	42.56	68.75	52.56	50.23
1958	20,522	10,319	16,236	47,077	23,373	4,703	11,792	39,868	43,895	15,022	28,028	86,945	46.75	69.53	57.93	54.14
1959	21,912	10,159	17,380	49,451	23,526	4,644	12,205	40,375	45,438	14,803	29,585	89,826	48.22	72.15	58.75	55.05
1960	22,671	10,785	17,689	51,145	23,307	4,753	12,869	40,929	45,978	15,538	30,558	92,074	49.31	65.38	57.89	55.55
1961	22,786	10,497	18,899	52,182	22,418	4,609	11,569	38,596	45,204	15,106	30,468	90,778	50.62	69.49	62.03	57.48
1962	24,585	11,309	20,232	56,126	23,902	4,400	11,646	39,948	48,487	15,709	31,878	96,074	50.40	71.94	63.47	58.42
1963	27,287	10,939	22,905	61,131	24,449	4,160	12,666	41,275	51,736	15,099	35,571	102,406	52.74	72.45	64.39	59.69
1964	29,988	11,622	25,175	66,785	25,034	3,453	12,600	41,087	55,022	15,075	37,775	107,872	54.50	77.44	66.64	61.91
1965	32,670	13,210	25,733	71,613	25,814	2,355	13,409	41,578	58,484	15,565	39,142	113,191	55.86	84.87	65.74	63.27
1966	36,113	15,465	27,219	78,797	27,458	1,861	14,903	44,222	63,571	17,326	42,122	123,019	56.80	89.26	64.62	64.05
1967	37,185	17,131	30,282	84,598	27,948	1,641	16,077	45,666	65,133	18,772	46,390	130,264	57.09	91.26	65.28	64.94

Source: U. S. Bureau of Mines, Minerals Yearbooks.

TABLE 2

NEW COAL MINES
PLACED IN OPERATION OR ANNOUNCED
TRI-STATE AREA
ILLINOIS, INDIANA, WEST KENTUCKY

DEEP

Year	Location	Company	Mine Name	Approximate Annual Tons	Status
1959	Illinois	Freeman Coal Mining Corp.	Orient No. 5	1,600,000	Active
1959	Illinois	Old Ben Coal Corp.	Mine No. 21	3,000,000	Active
1964	Illinois	Truax-Traer Coal Co.	Coffeen	1,200,000	Active
1965	Illinois	Old Ben Coal Corp.	Mine No. 24	3,000,000	Active
1966	Illinois	Inland Steel Co.	Sesser	3,000,000	Active
1966	Illinois	Old Ben Coal Corp.	Mine No. 26	3,000,000	Active
1966	West Kentucky	Bell & Zoller Coal Co.	Zeigler No. 9	1,500,000	Active
1966	West Kentucky	Island Creek Coal Co.	Hamilton	5,200,000	Active
1967	West Kentucky	Webster County Coal Corp.	Dotiki	600,000	Active
1967	Illinois	Freeman Coal Mining Corp.	Orient No. 6	3,300,000	Active
1967	Illinois	Peabody Coal Co.	Eagle No. 1	2,000,000	Active
1967	West Kentucky	Peabody Coal Co.	River Queen	1,250,000	Active
1967	Illinois	Peabody Coal Co.	Midwest	500,000	Active
1968	West Kentucky	Pittsburg & Midway Coal Mining Co.	Drake No. 1 & No. 2	1,500,000	Active
1968	West Kentucky	Black Tam Mining Co.	Tam No. 2	800,000	Under Construction
1969	West Kentucky	Island Creek Coal Co. (TVA)	Providence	1,500,000	Under Construction
1970	Illinois	Peabody Coal Co.	Eagle No. 2	3,000,000	Under Construction
1971	Illinois	Monterey Coal Co. (Humble)	Macoupin Co.	2,500,000	Under Construction
1971	West Kentucky	Peabody Coal Co. (TVA)	Camp No. 1	3,000,000	Projected
1971	West Kentucky	Peabody Coal Co. (TVA)	Camp No. 2	3,000,000	Projected
	Total			44,450,000	

Source: Keystone News Bulletins, McGraw-Hill, Inc.

TABLE 3

NEW COAL MINES
PLACED IN OPERATION OR ANNOUNCED
TRI-STATE AREA
ILLINOIS, INDIANA, WEST KENTUCKY

STRIP

Year	Location	Company	Mine Name	Approximate Annual Tons	Status
1960	Illinois	Stonefort Coal Mining Co.	Allendale	600,000	Active
1960	Illinois	United Electric Coal Companies	Banner	600,000	Active
1962	West Kentucky	Peabody Coal Co.	Sinclair	4,000,000	Active
1962	Illinois	Ayrshire Collieries Corp.	Sunspot	800,000	Active
1963	West Kentucky	Peabody Coal Co.	Homestead	2,000,000	Active
1964	Illinois	Southwestern Illinois Coal Corp.	Captain	5,000,000	Active
1965	Indiana	Peabody Coal Co.	Hawthorne	1,500,000	Active
1966	Illinois	Truax-Traer Coal Co.	Burning Star No. 3	1,800,000	Active
1967	Indiana	Ayrshire Collieries Corp.	Ayrcoe	700,000	Active
1967	Illinois	Peabody Coal Co.	Eagle	1,000,000	Active
1968	Illinois	Truax-Traer Coal Co.	Norris No. 1	2,800,000	Active
1968	Illinois	Peabody Coal Co.	Elm	3,000,000	Active
1968	Indiana	Peabody Coal Co.	Dugger	2,500,000	Active
1970	West Kentucky	Ayrshire Collieries Corp. (TVA)	Ayrgem	2,500,000	Under Construction
1971	Indiana	Peabody Coal Co.	Universal	3,000,000	Under Construction
1971	Illinois	Ayrshire Collieries Corp. (Denmark)	Leahy	2,500,000	Under Construction
	Total			34,300,000	

Source: Keystone News Bulletins, McGraw-Hill, Inc.

TABLE 4

SUMMARY
NEW COAL MINES
ILLINOIS, INDIANA, WEST KENTUCKY

	1959		1960		1961		1962		1963		1964		1965		1966		1967		1968		1969	
	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons
DEEP - Illinois	2	4,600	-	-	-	-	-	-	-	-	1	1,200	1	3,000	2	6,000	3	5,800	-	-	-	-
Indiana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Kentucky	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	6,700	2	1,850	2	2,300	1	1,500
Total	2	4,600	-	-	-	-	-	-	-	-	1	1,200	1	3,000	4	12,700	5	7,650	2	2,300	1	1,500
STRIP - Illinois	-	-	2	1,200	-	-	1	800	-	-	1	5,000	-	-	1	1,800	1	1,000	3	8,300	-	-
Indiana	-	-	-	-	-	-	-	-	-	-	-	-	1	1,500	-	-	1	700	-	-	-	-
West Kentucky	-	-	-	-	-	-	1	4,000	1	2,000	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	2	1,200	-	-	2	4,800	1	2,000	1	5,000	1	1,500	1	1,800	2	1,700	3	8,300	-	-
GRAND TOTAL	2	4,600	2	1,200	-	-	2	4,800	1	2,000	2	6,200	2	4,500	5	14,500	7	9,350	5	10,600	1	1,500

Source: Keystone News Bulletins, McGraw-Hill, Inc.

TABLE 4

1965		1966		1967		1968		1969		1970		1971		Total	
s	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons	No. of Mines	Capacity Thousand Tons
	3,000	2	6,000	3	5,800	-	-	-	-	1	3,000	1	2,500	11	26,100
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	2	6,700	2	1,850	2	2,300	1	1,500	-	-	2	6,000	9	18,350
	3,000	4	12,700	5	7,650	2	2,300	1	1,500	1	3,000	3	8,500	20	44,450
	-	1	1,800	1	1,000	3	8,300	-	-	-	-	1	2,500	10	20,600
	1,500	-	-	1	700	-	-	-	-	-	-	1	3,000	3	5,200
	-	-	-	-	-	-	-	-	-	1	2,500	-	-	3	8,500
	1,500	1	1,800	2	1,700	3	8,300	-	-	1	2,500	2	5,500	16	34,300
	4,500	5	14,500	7	9,350	5	10,600	1	1,500	2	5,500	5	14,000	36	78,750

TABLE 5a

ECONOMIC STUDY
OF MIDWESTERN STRIP MINING
MINES PRODUCING 2,000,000 TONS ANNUALLY

Overburden Ratio		12.6	14.7	19.6	25.2
Recoverable Coal Reserves	(Thousand Tons)	40,000	40,000	40,000	40,000
Life of Mine	(Years)	20	20	20	20
Annual Production	(Thousand Tons)	2,000	2,000	2,000	2,000
Coal Thickness	(Inches)	69	59	44	34
Recovery	(Tons Per Acre)	7,800	6,600	4,940	3,840
Coal Acres Required		5,128	6,061	8,097	10,417
Initial Investment in Coal Lands, assuming average cost of $500 per acre and that 50 percent of lands would be acquired initially	(Thousands)	$ 1,282	$ 1,515	$ 2,024	$ 2,604
Annual Investment Required to purchase remaining 50 percent of lands	(Thousands)	$ 64	$ 76	$ 101	$ 130
Data on Stripping Equipment					
Maximum Digging Height	(Feet)	100	100	100	100
Average Digging Height	(Feet)	60	60	60	60
Annual Cubic Yards Required	(Thousands)	25,600	29,400	39,200	50,400
Size of Bucket on Stripping Shovel	(Cubic Yards)	90	105	140	180
Capital Costs					
Plant and Equipment					
Stripping Shovel	(Thousands)	$ 6,500	$ 9,000	$12,000	$15,000
All Other Equipment-Haulage Trucks, Coal Loaders, Bulldozers, Overburden Drills, Preparation Plant	(Thousands)	5,000	5,300	5,600	5,900
Total Initial Investment	(Thousands)	$11,500	$14,300	$17,600	$20,900
Replacement of Short-Life Equipment Over Life of Mine	(Thousands)	4,500	5,100	5,700	6,300
Total Depreciable Equipment	(Thousands)	$16,000	$19,400	$23,300	$27,200
Unit Depreciation	(Per Ton)	$0.400	$0.485	$0.583	$0.680
Total Initial Investment					
Plant and Equipment	(Thousands)	$11,500	$14,300	$17,600	$20,900
Coal Lands	(Thousands)	1,282	1,515	2,024	2,604
Total	(Thousands)	$12,782	$15,815	$19,624	$23,504
Initial Investment Per Annual Ton		$6.39	$7.91	$9.81	$11.75

TABLE 5b

ECONOMIC STUDY
OF MIDWESTERN STRIP MINING
MINES PRODUCING 2,000,000 TONS ANNUALLY

Overburden Ratio		12.6	14.7	19.6	25.2
Cost Per Yard					
Stripping (Labor and Supplies)	(Per Yard)	$0.055	$0.050	$0.050	$0.050
Bankshooting (Labor and Supplies)	(Per Yard)	0.015	0.015	0.015	0.015
Total Operating Cost	(Per Yard)	$0.070	$0.065	$0.065	$0.065
Cost of Production					
Stripping and Bankshooting	(Per Ton)	$0.882	$0.956	$1.274	$1.638
Coal Loading	(Per Ton)	0.120	0.130	0.140	0.160
Coal Haulage	(Per Ton)	0.250	0.260	0.300	0.350
Coal Preparation	(Per Ton)	0.220	0.220	0.220	0.220
Other Operating Costs	(Per Ton)	0.350	0.360	0.380	0.400
Welfare Fund	(Per Ton)	0.400	0.400	0.400	0.400
Sales and Administration	(Per Ton)	0.150	0.150	0.150	0.150
Total Cash Costs	(Per Ton)	$2.372	$2.476	$2.864	$3.318
Depreciation	(Per Ton)	0.400	0.485	0.583	0.680
Depletion	(Per Ton)	0.064	0.076	0.101	0.130
Total Cost of Production	(Per Ton)	$2.836	$3.037	$3.548	$4.128
Annual Net Cash Flow Required for 12 Percent DCF Return on Investment	(Thousands)	$1,711	$2,117	$2,627	$3,147
Add Average Annual Expenditures for Plant and Equipment	(Thousands)	225	255	285	315
Coal Lands	(Thousands)	64	76	101	130
Annual Gross Cash Flow Required	(Thousands)	$2,000	$2,448	$3,013	$3,592
	(Per Ton)	$1.000	$1.224	$1.506	$1.796
Sales Realization Required for 12 Percent Return on Investment (see TABLE 5c)	(Per Ton)	$3.635	$4.070	$4.860	$5.721

TABLE 5c

ECONOMIC STUDY
OF MIDWESTERN STRIP MINING
MINES PRODUCING 2,000,000 TONS ANNUALLY

Overburden Ratio		12.6	14.7	19.6	25.2
Sales Realization	(Per Ton)	$3.635	$4.070	$4.860	$5.721
Cost of Production	(Per Ton)	2.772	2.961	3.447	3.998
Net Profit	(Per Ton)	$0.863	$1.109	$1.413	$1.723
10 Percent of Sales Realization	(Per Ton)	$0.364	$0.407	$0.486	$0.572
50 Percent of Net Profit	(Per Ton)	0.431	0.554	0.706	0.862
Taxable Income	(Per Ton)	$0.499	$0.702	$0.927	$1.151
Income Tax @ 52.8 Percent	(Per Ton)	0.263	0.370	0.490	0.607
Income After Tax	(Per Ton)	$0.600	$0.739	$0.923	$1.116
Add Back Depreciation	(Per Ton)	0.400	0.485	0.583	0.680
Gross Cash Flow	(Per Ton)	$1.000	$1.224	$1.506	$1.796

APPENDIX

CABLE ADDRESS "WEIRCO"

PAUL WEIR COMPANY
INCORPORATED
MINING ENGINEERS AND GEOLOGISTS
(312) FINANCIAL 6-0275
20 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

PAUL WEIR, CHAIRMAN OF THE BOARD
CLAYTON G. BALL, PRESIDENT
JOHN P. WEIR, EXECUTIVE VICE PRESIDENT
JOHN S. SNYDER, COMPTROLLER

VICE PRESIDENTS
JOHN E. GOOD
RAYMOND K. ZIMMERMAN
EDWIN GAMMETER
DONALD H. DOWLIN
DAVID J. KACHNIK

July 12, 1967

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
307 North Michigan Avenue
Chicago, Illinois 60601

Dear Mr. Nugent:

For the past forty-seven years I have been a resident of Illinois and have been in the coal industry continuously during these years. For the first sixteen years I was engaged in engineering and production for a major Illinois coal operator. For the past thirty-one years I have had my own firm of independent mining engineers serving as consultants to entities interested in coal reserves and mining.

In the tri-state area of Illinois, Indiana and West Kentucky my firm has rendered services to all of the major coal producers, to the United States Army Corps of Engineers, to the major utilities operating in this area, to the railroads, to financial institutions, to major oil companies and others. In this work we have had the opportunity to study and become familiar with the coal reserves in the hands of our clients as well as the estimates of the Illinois State Geological Survey.

For the purposes of demonstrating the ultimate availability of strippable coal reserves, you have asked our opinion as to the availability of areas in the State of Illinois of strippable coal reserves containing as much as 10 to 20 millions of recoverable tons and not now owned or under option to coal operators, with emphasis on the Fulton-Peoria-Stark-Knox Counties fields. The only reserves in Illinois that can be considered for strip mining are found in Seams No. 5, No. 2 and No. 6, and our discussion is limited to those seams.

In the Fulton-Peoria area, the No. 5 Seam has been the one most widely mined. Remaining strippable reserves of any consequence in this seam are owned and/or controlled by two operating companies, United Electric and a competitor.

Some production has come from the No. 6 Seam, principally in the northern part of the county (Fulton). The strippable coal reserves extend north into Knox County. Mining in the No. 6 Seam is substantially different from that in the No. 5 Seam. The seam (No. 6) is thinner, the quality of the coal as mined is substantially inferior, and there is a lack of uniformity of coal occurrence. The stripping ratio (cubic yards of overburden to one ton of marchantable coal) is much greater than in the case of No. 5 Seam.

Presently there are two strip mines working in the No. 2 Seam in Fulton County. One was developed in 1958 and the other in 1962. The one mine is located on the Illinois River and utilizes barge transport exclusively. The other is located sufficiently close to the River to take advantage of barge transport. This lower cost transportation tends to offset the higher production cost of the No. 2 Seam coal. The thickness of the No. 2 Seam is approximately one-half that of the No. 5 Seam.

The Illinois Geological Survey has made estimates of the quantities of coal that occur at various depths below the surface. These estimates have no relationship to the profitability or lack of profitability of strip mining. Likewise, the estimates do not reflect the availability of surface. There are large areas that lie within the corporate limits of towns and cities. Accordingly, those estimates do not demonstrate and were not intended to demonstrate the availability of strippable reserves that can be mined profitably.

The ceiling on the price obtainable for coal for steam raising purposes is now being established by nuclear fuel. In addition, there has been tremendous progress in recent years in the development of larger and larger excavating equipment for removing the overburden from the coal seam. The effect of this has been to permit the removal of as much as 125 feet of overburden thickness from the former limit of 55 to 60 feet. A special problem arises when the overburden thickness exceeds 125 feet. This problem concerns the stability of the spoil bank which renders improbable any future technological progress in this regard. The effect of these two factors is to limit the amount of stripping of the No. 2 and No. 6 Seams that can be profitably accomplished and, in our opinion, reserves in these seams of any consequence that can be mined profitably are already controlled by operating companies.

PAUL WEIR COMPANY

Mr. Frank Nugent

July 12, 1967
- 3 -

The status of available strip coal reserves in other parts of the State of Illinois is similar to that in the four-county field. This is particularly the case in the so-called Belleville area (Jackson, Perry, Randolph and St.Clair Counties). These reserves are almost completely controlled by four operating companies, United Electric and three competitors. The one virgin area of substantial size is owned by a fifth operating company. The same situation prevails in Williamson and Saline Counties. Control is in the hands of three operating companies.

Returning to your specific question, in our opinion there are not available for purchase from non-operating owners a sufficient number of adjoining tracts that when assembled would amount to strippable coal reserves over 10 million tons.

Sincerely yours,

Paul Weir

PW:vlw

PAUL WEIR COMPANY

Source Material Employed in Preparation of Report by Paul Weir Company

A. Analysis of Strip-Mining Potential of the Seven Specific Coal Fields Itemized on Page 1

1. Engineering data supplied by United Electric for each field

   a. Property and/or drill maps.

   b. Logs of representative drill holes.

   c. Analyses of drill-hole cores.

2. Background and Perspective

   a. Cady, Gilbert H., Analyses of Illinois Coals. Supplement to Bulletin 62, Illinois State Geological Survey, 1948.

   b. Smith, William H., Strippable Coal Reserves of Illinois: Part 3 - Madison, Macoupin, Jersey, Greene, Scott, Morgan and Cass Counties. Circular 311, Illinois State Geological Survey, 1961.

   c. Smith, William H., and Berggren, Dwain J., Strippable Coal Reserves of Illinois: Part 5A - Fulton, Henry, Knox, Peoria, Stark, Tazewell, and parts of Bureau, Marshall, Mercer and Warren Counties. Circular 348, Illinois State Geological Survey, 1963.

   d. Reinertsen, David L., Strippable Coal Reserves of Illinois: Part 4 - Adams, Brown, Calhoun, Hancock, McDonough, Pike, Schuyler, and the southern parts of Henderson and Warren Counties. Circular 374, Illinois State Geological Survey, 1964.

   e. General and specialized knowledge of Paul Weir Company as consultants in the coal industry since 1936.

Source Material (continued)

B. Economics and Reserve Position Bituminous Coal Mining Illinois, Indiana and West Kentucky

1. U. S. Bureau of Mines, Minerals Yearbooks.

2. U. S. Geological Survey, Stripping-Coal Resources of the United States. Bulletin 1252-C, 1968.

3. Simon, J. A., and Smith, W. H., "An Evaluation of Illinois Coal Reserves Estimates". Presented at the 76th Annual Meeting of the Illinois Mining Institute, Springfield, Illinois, October 25, 1968.

4. Risser, Hubert E., "Coal Strip Mining - Is It Reaching A Peak?". Presented at the Fall Meeting of the Society of Mining Engineers, Minneapolis, Minnesota, September 18, 1968.

5. Coal Reserve Estimates provided by Counsel for the defendants in United States v. General Dynamics, et al.

6. McGraw-Hill, Inc., Keystone News Bulletins.

C. Ability of United Electric to Undertake Successful Deep Coal Mining.

JOHN E. ORGAN
GEOLOGIST
SHERMAN BLDG.
SULLIVAN, INDIANA

DEPOSITION
88

Availability of Economically Mineable
Strip Reserves within the State of Illinois

Report by John E. Organ, Geologist

In 1928, the writer obtained a Bachelor's degree in geology from Indiana University and a master degree the following year from George Washington University. An additional year of graduate work toward a Doctor's degree in geology was also spent at George Washington University. During both this period of formal education and immediately afterward, the writer found employment with an oil company and then with an operator of a strip mine in Sullivan County, Indiana.

Continuously since 1932, except for the war years, my principal occupation has been the exploration or acquisition for others of coal lands and mining rights. During this time, I have been responsible, directly or indirectly, for the exploitation of coal fields in the Midwest totaling hundreds of millions of tons. Mines subsequently developed from these properties include the Minnehaha mine of Ayrshire Collieries, the Buckheart Mine of The United Electric Coal Companies, the Sunspot Mine of Ayrshire Collieries in Clinton, Indiana, the Panther Mine of Green Coal Company in west Kentucky, the Shasta Mine of Binkley Coal Company, predecessor to Truax-Traer Coal Company, near Bicknell, Indiana, and the Sunspot (Illinois) Mine of Ayrshire Collieries. While these properties and others all involved strip coal, I have also been involved in the exploration or acquisition for others of deep coal within the States of Indiana and Illinois. In addition, I was instrumental in the acquisition of coal rights to approximately 750 million tons of strip coal in Wyoming and another 100 million tons in Montana.

JOHN E. ORGAN
GEOLOGIST
BRENNAN BLDG.
SULLIVAN, INDIANA

At present, I am on retainer to Ayrshire Collieries Corporation as a consultant.

At one time or another, I would estimate that I have made on-site investigations in virtually every coal producing county in the States of Illinois, Indiana and west Kentucky. I have made it my business to keep informed and abreast of developments in midwestern coal mining and attitudes and opinions of midwestern coal producers. I have also made frequent use of data periodically made available by The Illinois State Geological Survey and its counterpart in Indiana and Kentucky.

Based upon my knowledge and experience, I concluded that, by 1960, there was no longer any possibility of acquiring or establishing, for transfer to coal producers, of any new economically mineable strip coal acreage in the Illinois basin of sufficient size to justify the opening of new mines. Therefore, my subsequent activity was confined to investigation of deep coal properties in the Midwest and strip coal properties in the South and West. Within the past two years, I have, on numerous occasions, discussed the availability of strip reserves in the Midwest with a variety of coal executives knowledgeable in this field. I have also re-reviewed data released by the Illinois Geological Survey pertaining to this question. In my opinion, there remains no doubt that such economically mineable strip reserves as exist within the Illinois basin are under the control of existing producers, and that such other strip reserve acreage that has not been acquired holds no competitive promise. My own personal business decisions have, since 1960, been bottomed on this premise.

John E. Organ
Geologist

DEFENDANT'S EXHIBIT 89

IMPACT OF SULFUR OXIDE REGULATIONS ON MIDWEST COAL MARKETS

Prepared for

Kirkland, Ellis, Hodson, Chaffetz and Masters
Prudential Plaza
Chicago, Illinois

RE: United States V. General Dynamics et al

By

Seversky Environmental Dynamics
Research Associates
1660 L Street, N. W.
Washington, D. C. 20036

July 16, 1969

TABLE OF CONTENTS

	Page
Part I - Sulfur Oxide Regulations	1
A - Federal Emphasis on Regulations of Sulfur Oxide	2
B - State and Local Regulations in the Midwest	8
Part II - Control of Sulfur Oxide Emissions	25
A - Substitution of Low Sulfur Fuels	26
B - Coal Desulfurization	32
C - Flue Gas Desulfurization	38
Limestone Injection	38
Combustion Engineering's Limestone Injection Plus Wet Scrubbing	42
Bureau of Mines Akalized Alumina Adsorption	49
Monsanto's Catalytic Oxidation	52
Wellman-Lord's Sulfite Scrubbing Process	57
Conclusion	63
References	64

PART I - SULFUR OXIDE REGULATIONS

The effects of sulfur dioxide on human health are related to irritation of the respiratory tract. Whether these effects are acute or chronic, reversible or irreversible, depends on the length and intensity of exposure. Damage to vegetation and materials and reduced visibility also result from sulfur dioxide concentrations.

Adverse effects of sulfur dioxide on a receptor can occur from exposure to very high concentrations for short periods, such as a few minutes, or from relatively low concentrations over extended periods of time such as several months or years. Estimates of acceptable air quality for very short averaging periods are of necessity predicated on laboratory and clinical observations. For somewhat longer averaging times criteria are based on epidemiologic studies which analyze the effect of sulfur dioxide on groups of people living in a community. On the basis of intensive review of these scientific studies on the effects of time-concentration exposures to sulfur dioxide, the Department of Health, Education, and Welfare has reached the following conclusions regarding desirable air quality objectives:

> 0.1 parts per million (ppm) on a 24-hour average should not be exceeded more than one day in any 100 consecutive day period.
>
> 0.25 ppm should not be exceeded for more than one hour in any four consecutive day period.

0.5 ppm should not be exceeded for more than five minutes in any eight hour period.

The atmosphere in a polluted community usually contains a mixture of contaminants which collectively may have even greater deleterious effects on human health. Particulate matter emitted into the atmosphere is as much a health problem as is sulfur dioxide. Certain particles which are porous and have large surface areas trap sulfur dioxide gases within their pores and on their surface. These particles carry sulfur dioxide into the lungs where normally the gas would be unable to remain as an unattached molecule.

The Department of Health, Education, and Welfare has recently published two air quality criteria documents on particulates and oxides of sulfur. The fact that both were published at the same time indicated their combined importance and synergistic effects.

FEDERAL EMPHASIS ON REGULATION OF SULFUR OXIDES

From 1955 to 1965, the U. S. Department of Health, Education, and Welfare conducted several investigations of the extent of community air pollution problems throughout the country. In the midwest, extensive studies were carried out in Louisville, Kentucky, Nashville, Tennessee, and St. Louis, Missouri. Both particulate matter and sulfur dioxide levels were investigated.

As a result of these and other investigations, the Department, by 1964, began to stress the importance of sulfur oxides to the

nation's total air pollution problem.

At that time there were competing applications before the Federal Power Commission to increase the natural gas supply to Los Angeles. The most controversial issue in the case was the effect of the natural gas supply on the Los Angeles air pollution problem. It was contended by air pollution control officials and others that exclusive seasonal use of this virtually sulfur-free fuel was necessary to the health and welfare of the people of Los Angeles. The El Paso Natural Gas Company and Transwestern Pipeline Company proposed increased deliveries on an interruptible basis. Gulf Pacific proposed a less flexible 20-year fixed fuel supply. The latter was supported by the Los Angeles County Air Pollution Control District and the California Public Utilities Commission whose position was reinforced by the expert testimony of Vernon G. MacKenzie, then Assistant Surgeon General of the Public Health Service and Chief of the Federal Division of Air Pollution. Mr. MacKenzie testified that sulfur dioxide "concentrations of 10 parts per hundred million (0.1 ppm on a 24-hour average) correspond to about the lowest average concentration which has been associated with undesirable effects on humans" and that this concentration should not be exceeded more than one percent of the time. However, he maintained that there is no evidence to substantiate categorically that even this is a safe level.

Sulfur dioxide emissions became an issue at the Federal Power Commission again in 1967 when the Department supported efforts to increase the supply of natural gas to Consolidated Edison in New York. It contended that Con Ed's generating plants contributed significantly to Metropolitan New York's sulfur dioxide levels, which exceeded the 0.1 ppm criterion, and that increased use of natural gas by Con Ed would contribute to the 83 percent reduction in concentrations necessary to meet it. In this case the Commission acted favorably on the application of the supplier.

During this hearing the Department backstopped its contentions on the fuel needs of the private sector of Metropolitan New York by pointing to the stringency of the sulfur-in-fuel restrictions imposed on Federal facilities in that area which are based on the 0.1 ppm criterion.

These regulations which also apply to the Chicago and Philadelphia metropolitan areas, were promulgated by the Secretary of Health, Education, and Welfare pursuant to Executive Order No. 11282 of May 26, 1966. The order directs all Federal agencies to take steps to prevent and control air pollution from their installations.

Though the regulations take the form of emission limitations they are, in effect, sulfur-in-fuel regulations because, as the National Air Pollution Control Administration recently advised one Federal agency, current research on developing control techniques

for reducing sulfur oxides from stack gas is directed toward methodology for power-generation sources and not toward combustion units as small as those utilized in these facilities. The regulations specify that emissions shall not exceed 0.35 lbs. of SO_x per 10^6 BTU in New York City or 0.65 in Chicago and Philadelphia. The equivalent sulfur content of fuels thus required are 0.2 percent for coal and 0.3 percent for oil in the New York area and 0.45 percent and 0.6 percent respectively in Chicago and Philadelphia. (The Metropolitan Chicago counties covered by the regulations are McHenry, Kane, Lake, Cook, Dupage, and Will in Illinois, and Lake and Porter in Indiana.)

Federal facilities located outside of the three specified areas must conform to state and local air pollution regulations of the areas in which they are located or, in the absence of such regulations, must burn the lowest sulfur content fuel that is reasonably available. In determining reasonable availability, the factors to be considered include price, firmness of supply, extent of existing pollution, and assurance of supply under adverse weather and natural disaster conditions.

Another vehicle which the Department has employed since 1966 to promote the adoption of standards conforming to its recommended air quality objectives is an abatement action. The Clean Air Act authorizes the Secretary of Health, Education, and Welfare to initiate abatement procedures in interstate pollution situations and

empowers him to act when requested to do so by a state in either interstate or intrastate air pollution problems. Nine interstate and one intrastate abatement actions instituted to date include:

Selbyville, Delaware - Bishop, Maryland
Ticonderoga, New York - Shoreham, Vermont
New York - New Jersey Metropolitan Area
Kansas City, Kansas - Kansas City, Missouri
Lewiston, Idaho - Clarkston, Washington
Washington, D.C. Metropolitan Area
Parkersburg, West Virginia - Marietta, Ohio
Ironton, Ohio - Ashland, Kentucky - Huntington, West Virginia
Knox Township, Ohio - New Cumberland, West Virginia

Garrison, Montana (intrastate)

The relative stringency of sulfur-in-fuel limitations required to alleviate varying levels of existing pollution can be illustrated by considering only two of the abatement actions. In the New York - New Jersey Metropolitan Area, which has the highest ambient air levels of sulfur dioxide in the Nation, the abatement conference participants recommended the 0.1 ppm for a peak 24-hour average concentration and stringent sulfur-in-fuel regulations identical to those governing Federal facilities in that area--i.e., 0.2 percent for coal and 0.3 percent for oil. In the Parkersburg, West Virginia - Marietta, Ohio, abatement action, on the other hand, the conference participants recommended the same ambient air standard, but recommended less stringent sulfur limitations--2.0 percent on fuels burned by all existing power or steam generating plants after October 1, 1968, and 1.5 percent for all new or expanded power or steam generating plants. This, of course, reflects the fact that the sulfur dioxide levels in the Parkersburg-

Marietta area were not as high as those of New York City and the same stringency of regulation would not be required to achieve similar ambient air quality. (The Secretary of Health, Education, and Welfare has not as yet issued formal recommendations for Parkersburg-Marietta.)

In January of 1969 the Department published the first criteria documents on sulfur dioxide and particulate matter. The criteria will serve as a basis for air quality and emission standards which the states will be required to set applicable to air quality control regions. The final conclusions of the sulfur dioxide criteria document state that adverse health effects were observed when 24-hour average levels of sulfur dioxide exceeded 0.11 ppm for three to four days and advised that in promulgating air quality standards consideration should be given to margins of safety--another reference, if indirect, to the recommended 0.1 ppm for a peak 24-hour average concentration.

B. STATE AND LOCAL REGULATIONS IN THE MIDWEST

The Air Quality Act places primary responsibility for the prevention and control of air pollution at its source on state and local governments and encourages cooperative activities between them leading to uniform laws. It also encourages similar cooperation between states. However, air quality control regions shall be designated by the Secretary when in his judgement protection of public health and welfare requires establishing air quality standards.

As of June 15, 1969, 13 regions had been designated and five proposed out of a total of 57 areas throughout the country which have been identified for inclusion. Regions to be established in the vicinity of the midwest coal fields include:

Minneapolis-St. Paul, Minnesota
Milwaukee, Wisconsin
Detroit, Michigan
St. Louis, Missouri
Chicago, Illinois
Indianapolis, Indiana
Dayton, Ohio
Cincinnati, Ohio
Toledo, Ohio
Louisville, Kentucky
Memphis, Tennessee

Many states and localities have commonly regulated particulate emissions. In recent years more than half of the new particulate emission ordinances have been more restrictive than one pound per million BTU hourly input, and the trend is to limits less than 0.5

pounds. The New York City requirement for 99% efficiency of particulate control equipment on bituminous coal burning units and the recent New Jersey State proposal to require the same efficiency level of all dust collection control equipment recognize the improved particulate control technology of today. The cost of highly efficient particulate control equipment is, of course, an economic factor for coal burning operations, particularly when coal of high ash content and low volatility is utilized.

Any existing sulfur oxide standards in the eleven areas listed earlier, as well as in others who act voluntarily, are subject to change and new ones will soon be promulgated. Conclusions of the document "Air Quality Criteria For Sulfur Oxides" and the stringent air quality objectives consistently recommended by the Department in the past strongly suggest that the Secretary will approve air quality and emission standards of state agencies only if they are consistent with the Department's guidelines.

Table 1 outlines the existing and locally proposed air quality standards for sulfur dioxide in the area of the midwest coal fields. These standards prescribe the exposure to this pollutant which a political jurisdiction determines should not be exceeded in a specified geographic area, and are used as one of several factors in designing legally enforceable pollutant emission standards. The table illustrates the trend to adoption of 0.1 ppm for a maximum 24-hour

TABLE 1

AIR QUALITY STANDARDS FOR SULFUR DIOXIDE IN THE AREA OF THE MIDWEST COAL FIELDS

AREA	CONCENTRATION	AVERAGING TIME - FREQUENCY
Minneapolis-St. Paul Metropolitan Area	0.02 0.10 ppm	maximum annual average 24-hr. average not to be exceeded over 1-day in any 3-month period.
St. Louis Metropolitan Area *	0.02 ppm 0.10 ppm	maximum annual average (24-hr. sampling time) 24-hr. average not to be exceeded over 1-day in any 3-month period.
Chicago Metropolitan Area ** (proposed - subject to public hearing)	Interim Goal to be Met by 1-1-72	
	0.03 ppm	maximum annual average (24-hr. sampling time)
	0.15 ppm	24-hr. average not to be exceeded more than 1% of the time.
	0.25 ppm	24-hr. maximum
	Standard to be Met by 1-1-74	
	0.015	maximum annual average (24-hr. sampling time)
	0.10	24-hr. average not to be exceeded more than 1% of the time.
	0.20	24-hr. maximum
	0.5	1-hr. maximum

*City of St. Louis and St. Charles, St. Louis, and Jefferson Counties
**McHenry, Kane, Lake, Cook, Dupage, and Will Counties

809

TABLE 1 - CONTINUED

AIR QUALITY STANDARDS FOR SULFUR DIOXIDE IN THE AREA OF THE MIDWEST COAL FIELDS

AREA	CONCENTRATION	AVERAGING TIME - FREQUENCY
Illinois Portion of St. Louis Metropolitan Area* (proposed-subject to public hearing)	Both 1972 interim goals and 1974 Standards are the same as for Chicago Metropolitan Area.	
East Chicago, Indiana	No person shall cause, let, permit, suffer or allow any emission of sulfur oxides which results in ground level concentration of sulfur oxides at any given point in excess of 0.5 ppm (volume) in the period of any hour and average exposure shall not exceed 0.1 ppm (volume) of sulfur oxide in any 24-hour period. These limitations shall not apply to ground level concentration occurring on the property from which such emission occurs, provided such property, from the emission point to the point of any such concentration is controlled by the person responsible for such emission.	
Gary, Indiana	Same as East Chicago	
Hammond, Indiana	Same as East Chicago	
Cincinnati (proposed)	0.2 ppm	1-hr. average not to be exceeded more than 1 time in any 7-day period.
	0.10 ppm	24-hr. average not to be exceeded more than 4-days in any calendar year.
	0.02 ppm	maximum annual average

*Madison, St. Clair, and Monroe Counties

TABLE 1 - CONTINUED

AIR QUALITY STANDARDS FOR SULFUR DIOXIDE IN THE AREA OF THE MIDWEST COAL FIELDS

AREA	CONCENTRATION		AVERAGING TIME - FREQUENCY
Kentucky State (proposed)	I, II, III, Rural, Residential, Commercial	IV Industrial	
	.04 ppm	.06 ppm	one year
	.09 ppm	.04 ppm	one month
	.18 ppm	.27 ppm	one day (24-hr) 99% (once in 3 mos)
	.32 ppm	.48 ppm	two hours 99% (once in 8 days)
	.38 ppm	.57 ppm	one hour 99% (once in 4 days)
Nashville-Davidson County, Tennessee	0.02 ppm		maximum annual average (24-hr. sampling time)
	0.10 ppm		24-hr average not to be exceeded over 1-day in any consecutive 100 day period.
Memphis, Tennessee (also proposed for Shelby County)	No person shall cause, allow, or permit any emissions of sulfur oxides which results in ground level concentrations at any point in excess of 0.5 ppm by volume for a continuous period of more than 1-hr., and the average concentration shall not exceed 0.10 ppm by volume of sulfur oxides in any 24-hr. period.		

average sulfur dioxide concentration. This standard is already in effect in St. Louis, East Chicago, Gary, Hammond, Nashville-Davidson County, and Memphis, and is proposed for Minneapolis-St. Paul, Cincinnati, and Shelby County, Tennessee.

The Illinois State proposal for its portions of the Chicago and St. Louis air quality control regions is for a 0.20 ppm maximum 24-hour average, but since the proposed standards would permit the 24-hour average to exceed 0.10 ppm only 1 percent of the time, it is essentially the same as the others. Thus, the Kentucky State proposal of 0.18 ppm for rural, residential, and commercial areas and 0.27 ppm for industrial areas is the only exception. The proposed Illinois standards are to be met by 1974, but as outlined in Table 1, it is also proposing interim goals to be met by 1972. Both the standards and goals are subject to public hearing in Chicago on August 5 and Edwardsville on August 12. The standards adopted for these two areas of Illinois could be applied statewide.

Table 2 lists current emission standards and sulfur-in-fuel regulations in the area of the midwest coal fields. Emission standards are enforceable limitations, usually based on ground-level concentrations, on the amount of a pollutant which may be emitted from any source. Sulfur-in-fuel regulations prescribe the sulfur content of fuels which may be transported into, sold, or burned in a given jurisdiction. Most recent regulations for control of sulfur oxides emissions are based on the latter. These generally correlate

TABLE 2

EMISSION STANDARDS AND SULFUR-IN-FUEL REGULATIONS IN THE AREA OF THE MIDWEST COAL FIELDS

LOCALITY	MAXIMUM ALLOWABLE SULFUR CONTENT (BY WEIGHT)	EFFECTIVE DATE
Minneapolis-St. Paul (proposed) (Less than 2,000 million BTU per hour capacity)	2.0%	Effective date of the Act (during air pollution alerts.)
(2,000 million or more BTU per hour capacity)	2.0%	Effective date of the Act (during air pollution alerts.)
	1.5%*(Coal) 2.2%*(Oil)	April 1, 1972 (during air pollution alerts.)
Cedar Rapids, Iowa (heat input of less than 1 million BTU per hour)	The lowest sulfur content fuel that is reasonably available.	November 5, 1968
St. Louis (Less than 2,000 million BTU per hour capacity)	2.0%	October 1, 1969 (applicable Oct.-March thereafter)
(2,000 million BTU per hour capacity or more)	No higher average sulfur content than the fuel or fuels used from 3-24-66 to 3-24-67	March 24, 1967
	2.2% (Oil)	March 24, 1970
	1.5% (Coal	March 24, 1970
Chicago	2.5%	July 1, 1970
	2.0%	July 1, 1971
	1.5%	January 1, 1973
Chicago (Federal Facilities)	0.6%*(Oil)	October 1, 1969
	0.45%*(Coal)	October 1, 1969
Cincinnati (Less than 200 million BTU per hour input	1.25%** on a day basis (averaged over a period of not less than one month nor more than one year	January 22, 1969
(more than 200 million BTU per hour input	new installations require policy decision of Air Pollution Board	Same
Nashville-Davidson County, Tennessee	2.0%	March 1, 1970

* Emission Standard

** Is deemed to comply with emission restrictions

To convert pounds of SO_2 emissions per million BTU to percentage of sulfur in fuel, place a straight-edge at appropriate number in right-hand column. Going from right-hand column to center column run straight-edge through number corresponding to the heat value of the fuel. Straight-edge then points to proper percentage figure in left-hand column. To convert percentage of sulfur in fuel to pounds of SO_2 emissions, reverse the procedure.

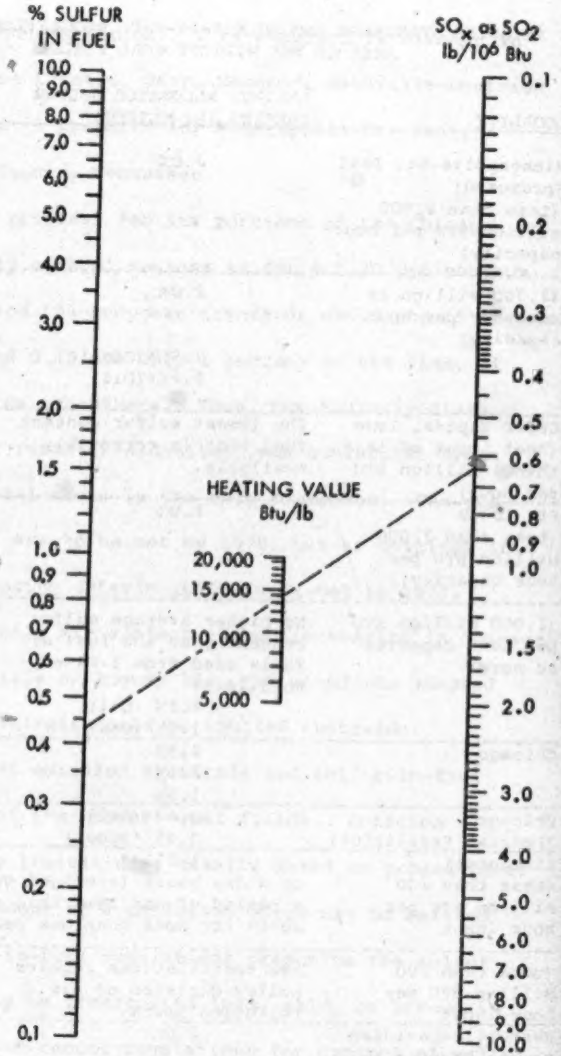


Figure 1. Nomograph for Calculating Sulfur Oxide Emissions.

evaluations of current air quality with the reduction in emissions of these pollutants necessary to obtain desirable air quality and represent calculations of the maximum sulfur content fuel which will produce emissions consistent with the required reduction. The choice of fuel within these limitations is then the province of fuel producers fuel suppliers, and fuel users. Some regulations which prescribe the sulfur content of fuels provide a discretionary clause as to fuel use so long as sulfur dioxide emissions do not exceed prescribed limits. This leaves the fuel user free to exercise other options of control if and when they are available. (In some cases the figures in Table 2 were calculated from the "Nomograph for Sulfur Oxide Emissions" (Figure 1).)

Without exception, the state air pollution control agencies of Minnesota, Wisconsin, Michigan, Iowa, Missouri, Illinois, Indiana, Ohio, Kentucky, and Tennessee report varying stages of activity in developing new sulfur dioxide standards or revising old ones at the state or local level, or both.

The Chicago City Council, last month, postponed the effective date of the first step in its three-stage sulfur-in-fuel regulation from July 1, 1969, to July 1, 1970. This step limits the sulfur content to 2.5 percent. The effective dates of the other two stages--

2.0 percent on July 1, 1971, and 1.5 percent after January 1, 1973--were not altered by this change (Table 2).

In 1968 the Missouri Air Conservation Commission agreed to postpone the effective date of the sulfur-in-fuel regulation for the non-utility market in St. Louis from that year to 1970 on the condition that Peabody Coal Company drop a suit challenging the legality of the regulations and undertake to open a low-sulfur coal mine to supply the non-utility St. Louis market. However, when Peabody announced early in June, 1969, that it was abandoning plans to open the mine, the effective date immediately was advanced from 1970 to the 1969 heating season.

The other sulfur-in-fuel regulations for smaller combustion units outlined in Table 2 show limitations ranging from 0.6 percent for oil and 0.45 percent for coal for Federal facilities in Chicago, to 1.25 percent in Cincinnati, and 2.0 percent in Minneapolis-St. Paul and Nashville-Davidson County. Cedar Rapids requires the use of fuel with the lowest sulfur content that is reasonably available.

Cincinnati's regulation is actually an emission limitation but stipulates that the use of fuels containing less than 1.25 percent sulfur on a dry basis, averaged over a period of not less than one month nor more than one year, is deemed to comply with the emission limitation. The regulations restrict the concentration of sulfur dioxide from exhaust gas to that concentration resulting

from the burning of the fuel having an average sulfur content no higher than that used collectively in combustion equipment of less than 200 million BTU per hour input rating in the City during the 24-months prior to January 22, 1969.

The proposed Minneapolis-St. Paul restrictions, contained in Minnesota State regulations currently under consideration, would apply only during air pollution alerts. Such alerts would be declared at any time the 24-hour average concentration of sulfur dioxide in the ambient air exceeds the value of 0.1 ppm, and conversion to low sulfur fuel, a supply of which users will be expected to have on hand, will be required. The St. Louis regulations and those proposed for Minneapolis-St. Paul for combustion installations with a capacity of 2,000 million BTU per hour or more are emission standards and limit the emission of sulfur dioxide to 2.3 pounds per million BTU of heat input. In the absence of control equipment with the efficiency to prevent emissions over this level, fuel oil with a maximum sulfur content of 2.2 percent or coal with no more than 1.5 percent sulfur would have to be utilized. New installations of more than 200 million BTU per hour input in Cincinnati will require a policy decision of the Air Pollution Board. (There are presently no boiler units in the City of Cincinnati fired by coal or oil having an hourly heat input of more than 200 million BTU and none projected. All larger units burn natural gas.)

It is recognized that legislative bodies often pattern laws and

regulations after those of other jurisdictions. Dade County, Florida, for instance, adopted as its own several sections of the Los Angeles County ordinance and Minneapolis was earlier proposing an ordinance very similar to that of St. Louis. Furthermore, state agencies, when faced with a similar problem in several of its communities, may promulgate rules and regulations on a regional or even statewide basis. However, projections for midwest cities or metropolitan areas which have not as yet enacted sulfur-in-fuel regulations can best be made on the basis of available information on the extent of their sulfur dioxide problem.

The 1966 density of sulfur dioxide emissions for several midwest metropolitan areas has been calculated by the National Air Pollution Control Administration. Figure 2 illustrates the rate of emissions in tons per square mile per year. The Chicago-Gary, Indianapolis, Toledo, and Louisville-New Albany metropolitan areas had SO_2 emissions in excess of 200 tons/mi^2/yr. Detroit, St. Louis-East St. Louis, and Cincinnati-Covington had emission densities ranging from 100 to 200 tons/mi^2/yr. Other cities had less than 100 tons per square mile per year or were not surveyed.

Levels of sulfur dioxide measured in the ambient air in eleven of these communities has been tabulated by the National Air Pollution Control Administration (Table 3). Results are based on National Air Sampling Network impinger samples collected at one location for 24-hours approximately once every two weeks. Results

TABLE 3

Summary of 1967 Sulfur Dioxide Levels
in Major Midwest Metropolitan Areas.

METROPOLITAN AREA	NUMBER OF SAMPLES	PARTS PER MILLION *		
		MIN.	MAX.	ARITH. MEAN
Chicago, Illinois (CAMP)	24	0.004	0.254	0.089
Cincinnati, Ohio (CAMP)	24	0.006	0.050	0.016
Covington, Kentucky	26	0.001	0.029	0.012
Dayton, Ohio	25	0.001	0.042	0.008
Des Moines, Iowa	26	0.002	0.026	0.006
East Chicago, Indiana	24	0.008	0.160	0.045
Indianapolis, Indiana	23	0.003	0.062	0.020
Milwaukee, Wisconsin	24	0.005	0.038	0.016
Minneapolis, Minnesota	25	0.003	0.111	0.019
Nashville, Tennessee	24	0.002	0.029	0.009
St. Louis, Missouri (CAMP)	48	0.007	0.113	0.034

*All values are based on 24-hour averaging time.

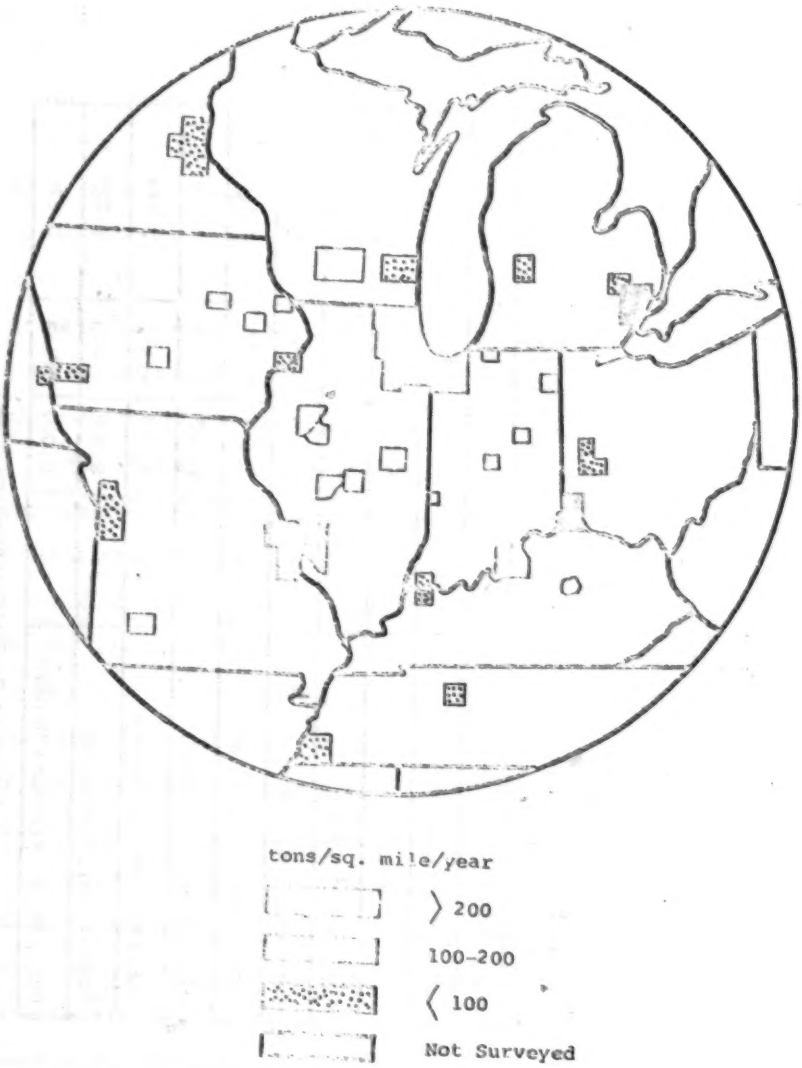


Figure 2. Estimated 1966 Emissions of Sulfur Dioxide in Major Midwest Metropolitan Areas.

are relevant to this report primarily to show relative pollution levels but are not adequate to define the magnitude or severity of a community's sulfur pollution problem.

Chicago showed the highest concentration of sulfur dioxide--some ten times that of Des Moines, Dayton, and Nashville which had the lowest levels. Intermediate concentrations, in descending order, were found in East Chicago, St. Louis, Indianapolis, Minneapolis, Milwaukee, Cincinnati, and Covington.

Within the next year or so regulations can be anticipated for air quality control regions in Milwaukee, Detroit, Indianapolis, Dayton, Toledo, Louisville, and Memphis. The emission density data and the air quality data do reflect expected similarities for communities in the entire region. For these metropolitan areas, sulfur-in-fuel limits in the range of 2.0 percent or less (or equivalent stack emission standard) can be anticipated.

For communities such as Des Moines, Davenport, Dayton, and Nashville, and other industrial centers of similar size, measured sulfur dioxide pollution levels and emission density suggest that sulfur-in-fuel limits slightly greater than 2.0 percent would suffice to provide desirable air quality. In these communities, regulations may well be promulgated to prevent gradual degradation of the existing air quality rather than allow pollution emissions to continue to increase until the standards are on the brink of being exceeded. Regulations may also be promulgated by these

smaller communities, without serious existing pollution problems, to prevent dumping of high-sulfur fuels which are banned in other areas. Also, as pointed out earlier, the State agencies may promulgate statewide regulations.

While some communities may use emission standards, a more direct approach is to limit the sulfur content of all fossil fuels to a maximum percent after a specified date. This approach is easier to enforce than emission limitations which would require expensive stack testing. Even Los Angeles with three highly qualified and experienced source test teams chose to limit the sulfur contents of combustion fuels rather than be obligated to undertake a very expensive, time consuming, and perennially controversial methodology of testing which could not be equitably and effectively implemented. Los Angeles County as early as 1958 adopted stringent sulfur-in-fuel regulations which have twice been strengthened, and which now limit sulfur content of fuel oil to 0.5 percent any time of the year.

In light of existing fuel regulations in the midwest and projections of regulations to come, the burning of coal having a sulfur content higher than 3.0 percent will be severely curtailed, if not altogether eliminated, in non-utility markets within the next ten years. Moreover, the regulatory trend, such as the existing St. Louis standards and those proposed for Minneapolis-

St. Paul requiring combustion installations with a capacity of 2,000 million BTU per hour or more to utilize 1.5 percent coal or employ efficient control equipment not yet commercially available, the proclivity of communities to pattern regulations after those of other communities, and forthcoming public consideration of new or revised regulations required for air quality control regions raise the possibility that the use of coal with a sulfur content in excess of 3.0 percent will also be severely curtailed in utility operations.

PART II - CONTROL OF SULFUR OXIDE EMISSIONS

Emphasis on sulfur oxides control technology research and development began with the Clean Air Act of 1963, continued with additional specific directions to the Secretary of Health, Education, and Welfare in an amendment in 1965, and was restated in the Air Quality Act of 1967. The latter Act requires the Secretary to "give special emphasis to research and development into new and improved methods, having industry-wide application, for the prevention and control of air pollution resulting from the combustion of fuels." The research is to be directed toward development of improved, low-cost techniques for the control of combustion byproducts and for removal of potential pollutants from fuel. Federal expenditures for these purposes have now reached a level of about $15 million a year. There are three main approaches presently being explored for reducing sulfur oxide emissions: substitution of low sulfur fuels, coal desulfurization, and flue gas desulfurization. Each of these approaches and the status of current projects are described in this part of the report.

A. SUBSTITUTION OF LOW SULFUR FUELS

One of the more obvious measures to reduce emissions of sulfur oxides is to use low sulfur fuels. Coal, oil, and natural gas exist with naturally-occurring sulfur contents low enough to satisfy sulfur oxide emission regulations, but the supplies of these fuels are limited--in the case of coal extremely so--and their availability and cost vary with geographic location.

Technology exists for reducing the sulfur content of oil and it is employed by refiners for removing greater and greater percentages of the sulfur in oil before refined products are sold. Natural gas contains virtually no sulfur and can meet any projected sulfur oxide limitation without alteration of its characteristics.

Essentially all of the residual fuel oil used in the midwest is produced in domestic refineries. Total production of this product in 1968 in PAD District II (North Central United States) was 56 million barrels. The sulfur content averaged about 1.75 percent. Thirty-three Federal facilities in the midwest reported using residual fuel oil in 1967 ranging in sulfur content from 0.4 to 8.0 percent with a median of 1.5 percent. Utilities also use residual oil but to a lesser degree. It is used by Union Electric at its Cahokia station in four of the six boilers. In 1968, 265,950 barrels were burned; this fuel had a sulfur content of 2.3 percent and the cost was $2.80 per barrel delivered (44 cents per million BTU).

Imported residual fuel oil could be put on barges at the Gulf Coast and moved to several large cities on the Mississippi River (Memphis, St. Louis, Davenport, and Minneapolis-St. Paul) or Ohio River (Louisville and Cincinnati) or other tributaries. According to a spokesman for a major oil company at the Industrial Fuels Conference held in St. Louis in February 1969, the price at the Gulf Coast is about $1.75 and allowing 60 cents per barrel for barge transportation, this fuel could be sold for $2.35 per barrel in the midwest (39 cents per million BTU). In 1968, barge movements of domestic resid via the Mississippi River from District III (Gulf States) to District II amounted to only about six million barrels. So long as new sulfur requirements are not extremely stringent (less than 1%) refiners can be expected to continue producing some residual fuel oil in domestic refineries using either domestic or foreign crude.

The Federal Power Commission has repeatedly granted authorization for increased natural gas deliveries to the midwest. The authorized supply and ready availability of natural gas to meet it have reduced coal usage in the domestic, commercial, and industrial fuel markets in the past and can be expected to infringe to some extent on the utility coal markets in the future. As an example, at the Commonwealth Edison plants in Chicago, natural gas is burned under boilers during the non-heating season for 22 to 30 cents per million BTU. The company has indicated its intention

of increasing gas consumption at its older plants located in or near the City of Chicago to help alleviate the sulfur oxide pollution problem.

A Federal Power Commission decision earlier this year allowed an additional 50 million cubic feet daily of natural gas--equivalent to 750,000 tons of coal annually--to be imported into the St. Louis market for non-utility use. This development was cited by the Peabody Coal Company as a factor in its decision to abandon the plan to open a low sulfur coal mine at Troy, Illinois, to serve the St. Louis retail market. Economics and mineability of the coal were other factors. Average values of natural gas for commercial and industrial uses consumed in the area of the midwest coal fields in 1967 are shown in Table 4.

Naturally-occurring low sulfur coal in the midwest field, (coal which can be mined and cleaned to 2.5% or lower sulfur content), reportedly is very scarce. Moreover, in existing electric utility coal-fired boilers technical and economic problems are sometimes associated with substituting low sulfur coal for the coal presently being burned. In switching from high to low sulfur coal, heat release, ash fusion temperature, and electrostatic precipitator efficiency can be greatly affected.

A recent report of the Federal Power Commission's West Central Advisory Committee stated that coal will be faced with continuing pressures as an energy source in the area. "In view

TABLE 4

AVERAGE VALUE OF NATURAL GAS CONSUMED IN 1967
IN THE AREA OF THE MIDWEST COAL FIELDS

(cents per Mcf)

STATE	COMMERCIAL USE	INDUSTRIAL USE (Encluding field use*)
Minnesota	72.6	34.3
Wisconsin	83.6	43.9
Michigan	81.9	50.8
Iowa	65.6	29.1
Missouri	61.4	29.9
Illinois	75.9	42.1
Indiana	85.6	44.3
Ohio	74.7	52.5
Kentucky	70.7	41.3
Tennessee	71.5	32.3

* "Field use" is use of gas for steam power generation for drilling and pumping; fuel for refineries; etc.

of the probably increasing fossil fuel costs and transportation difficulties, decreasing nuclear fuel costs, and a growing concern for air pollution," the report forecasts, "by the year 1990 nuclear fuel will account for 57 percent of the region's generating capacity and nearly 70 percent of its energy requirements."

Figure 3 shows that five nuclear power plants are operable in the 10-state area, 15 are being built, and eight are planned. The West Central region includes all of Illinois, Iowa, Minnesota, North Dakota, and Wisconsin, and substantial portions of Missouri, Nebraska, and South Dakota. In addition, it includes the upper peninsula of Michigan and small portions of Montana and Wyoming. The region accounts for about 14 percent of the population of the continental United States.

In this light, it can be concluded that the availability of natural gas in the midwest, the low sulfur content of the oil produced and refined there, and the growth of nuclear energy and mine-mouth plants will encourage air pollution control officials of the midwestern states to adopt regulations prescribing the legal limits of sulfur in fuels even though coal to meet them may be unavailable.

Figure 3
NUCLEAR POWER PLANTS IN THE UNITED STATES

The nuclear power plants included in this map are ones whose power is being transmitted or is scheduled to be transmitted over utility electric power grids and for which reactor suppliers have been selected

NUCLEAR PLANT CAPACITY
(KILOWATTS)

OPERABLE		2,828,700
BEING BUILT		35,114,400
PLANNED	REACTORS ORDERED	27,902,300
	REACTORS NOT ORDERED	8,255,000
	TOTAL	74,100,400

ELECTRIC UTILITY CAPACITY BY CONVENTIONAL MEANS AS OF JANUARY 31, 1969 291,160,974 KILOWATTS

LEGEND

OPERABLE ■ (72)
BEING BUILT ▲ (46)
*PLANNED (Reactors Ordered) ○ (32)

*9 more plants have been announced for which reactors have not yet been ordered.

U.S. Atomic Energy Commission
March 31, 1969

B. COAL DESULFURIZATION

The concept of coal desulfurization through pyrite removal, liquefaction, or gasification is not a new one. For years pyrite removal has been practiced to upgrade the quality of certain coals, increasing their value and marketability. Commercial production of artificial illuminating gas from coal was initiated about 150 years ago. Prior to and during World War II German scientists and engineers, realizing the need for alternate petroleum supplies, researched and developed commercially applicable coal liquefaction processes for producing aviation and motor gasolines, diesel fuel, and lubricants from coal. However, these processes were costly and hazardous. Desulfurization of coal in these instances was a byproduct and not a main objective. New impetus at the Federal level was given to research and development on desulfurization of coal after recent passage of several stringent air pollution regulations designed to control sulfur levels in the atmosphere. Each of these processes, their status, timing, and costs, are considered in the ensuing discussion.

Pyrite Removal

Sulfur occurs in coal in three principal forms: sulfate, organic, and pyritic. The amount of sulfate sulfur in freshly mined coal is normally small and of little significance. Organic

sulfur found in coal is more or less uniformly distributed throughout the coal substance in molecular combination and cannot be removed even partially without materially altering the nature of the coal substance. The organic sulfur content of coal generally ranges from a low of about 20 percent to a high of about 60 percent of the total sulfur. Obviously, the organic sulfur content of a coal is the prime parameter in determining whether or not significant total sulfur reductions can be made with a given coal by pyrite removal.

Since pyrite is present as a discrete particle, theoretically it can be separated mechanically from the associated coal. In most coals, however, the pyrite particles are so small and so intimately mixed with the coal that extremely fine crushing is necessary to break them apart and permit separation. Presently, this fine crushing is obtained only at utilities having pulverizers.

Bituminous Coal Research, Inc., is presently engaged in a pilot study on in-plant removal of pyritic sulfur utilizing characteristics of the pulverizer which accepts 1 1/2 in. coal, and deliver 200-mesh coal to the burners. Initial study involves optimization of pulverizer performance, seeking a maximum reject of pyrite with a minimum loss of good coal. The process will result in the rejection of a pyrite-rich fraction, with some loss of good coal which otherwise would have been burned. Additional

research by others is directed toward the ultimate utilization of the pyrite-rich coal fraction. Successful utilization can favorably affect the economics of the pyrite removal process.

As the pyrite particle size becomes smaller, the choice of cleaning becomes more difficult and costly. Furthermore, transportation of smaller sized coal particles (below about 1 1/4 inch) may lead to other problems.

Mechanical cleaning devices are divided into two general classes, wet and pneumatic, both involving a stratification effect. Depending on the quality of the final product desired, the cost may vary from 15 to 20 cents per ton for coarse cleaning without thermal drying to more than 70 cents per ton for fine coal cleaning (includes 40 cents per ton for thermal drying).

Use of chemical methods for sulfur reduction results in pyrite sulfur removal solely. With these methods, as with mechanical methods, pyrite particles must be physically separated from the coal substance before reactions for sulfur removal can be expected to take place at reasonable rates. Chemical treatment techniques are very expensive compared with the above costs of mechanical methods and it is doubtful that such exotic methods will advance to widespread commercial application. Because of the fine grinding required to expose the pyrite particles, chemical

treatment would have to be conducted at the site of use to avoid increased transportation costs. Furthermore, water used to remove the sulfates would have to be purified prior to disposal or re-use.

Mechanical and chemical methods of cleaning, at best, result only in partial removal of pyrite sulfur, itself only a fraction of the total sulfur in the coal. In the midwestern coal fields, where total sulfur content varies from about 2.0% to 5.0% and pyrite sulfur represents only 50% of this figure, coal cleaning methods which remove only a portion of the pyritic sulfur will not often result in coal quality sufficient for compliance with present or projected air pollution fuel use regulations. For example, if a coal containing 3.0 percent sulfur, 50 percent of which is pyritic sulfur, is cleaned by some process of one-third of the pyritic sulfur, the sulfur content is reduced by 0.5 percent to 2.5 percent. Therefore, for the utility coal market where long term coal contracts are common, it is doubtful that pyritic sulfur removal in itself will allow coal suppliers to meet the midwestern low sulfur fuel demands. Generally speaking, coal preparation prior to combustion will find application only where a relatively simple and inexpensive method of cleaning will remove sufficient sulfur from a specific coal to make it an acceptable fuel under terms of a particular market restriction.

Coal Gasification and Liquefaction

Technology for producing synthetic gas from coal has long been available. However, these processes produced gases with low calorific value, ranging from 120 to 600 BTU per cubic foot as contrasted with an average of 1,035 BTU per cubic foot for natural gas.

Several coal gasification processes currently under serious consideration are in various stages of development, although none is ready for commercial application. These processes are: hydrogasification, CO_2 acceptor, molten salt, and two-stage superpressure gasification.

Since 1964, the Office of Coal Research (OCR), Department of the Interior, has allocated approximately $25 million for research in this field. The American Gas Association (AGA) and the gas industry have spent about $7 million in the past 23 years supporting coal gasification research. From present development it can be readily concluded that pipeline gas obtained from the gasification of coal (presently estimated to cost approximately 40 cents to 50 cents per million BTU compared to 18 cents to 20 cents per million BTU for natural gas) will not be commercially available even on a limited basis within the next decade.

Liquefaction is not a desulfurization process per se because the sulfur is not removed and appears in the end-products which require subsequent hydrogenation treatment.

Since 1962, the OCR has allocated approximately $26 million to research and development for commercial coal liquefaction processes. These funds sponsored four projects: H-Coal Process, Project Seacoke, Project Coed, Project Gasoline.

Manufacture of synthetic liquid fuels does not promise to be a commercial reality for the next ten to 20 years, and at present most of the research in coal liquefaction is oriented toward the production of gasoline. High sulfur char, a byproduct of the liquefaction process, can be converted to a low sulfur substance with a potential to be used as a clean fuel. However, it is presently used only to generate enough power for the liquefaction process and has not been sought as a commercial fuel.

C. FLUE GAS DESULFURIZATION

First-generation flue gas processing methods which are approaching the stage where technical, engineering, and economic feasibility might be established for commercial application on large power plants include: (1) limestone injection, (2) Combustion Engineering's limestone injection plus wet-scrubbing, (3) Bureau of Mines' alkalized alumina adsorption, (4) Monsanto's catalytic oxidation, and (5) Wellman-Lord's sulfite scrubbing.

It should be recognized that about 20 years are required to go from paper studies through laboratory bench experiments, pilot plants, prototype plants, and commercial demonstration plants to commercial application. Because of this time factor, only the five first-generation processes listed earlier are considered in this report from the standpoint of technical feasibility, applicability, and economic considerations.

Limestone Injection

Technical feasibility: The least complex sulfur dioxide removal system is the introduction into the flue gas of an additive that will unite chemically with sulfur dioxide to form a solid compound. The compound thus formed can then be removed from the flue gas with conventional dust collection equipment. The use of finely-pulverized limestone or dolomite for this purpose is undergoing extensive study.

The relative simplicity of limestone injection as a means of removing oxides from power plant stack gas is a very attractive feature. The boiler serves as the reacter, no complicated regeneration system is needed, and no reheating of stack gas is required. (Figure 4)

Low degree of limestone reaction, however, is a major drawback. Unless new technology for improving sorption is developed, 24 to 35 percent utilization of the injected limestone is probably the highest attainable. Excess limestone can be used to increase sulfur dioxide removal, but adverse effect on power plant operation and cost of removing the increased dust burden from the gas and disposing of it then become major disadvantages.

A full-scale test of a limestone additive system will be conducted within the next year or so on a boiler at TVA's Shawnee Station, Paducah, Kentucky. Construction is to start this fall with several objectives:

1. Test selected limestones for sorption efficiency and slagging problems.

2. Develop an injection system that gives the proper sorbent distribution quickly.

3. Determine point and method of injection that gives optimum initial temperature level for limestone, calcined limestone, and hydrated lime.

4. Gather data on benefit of small particle size.

889

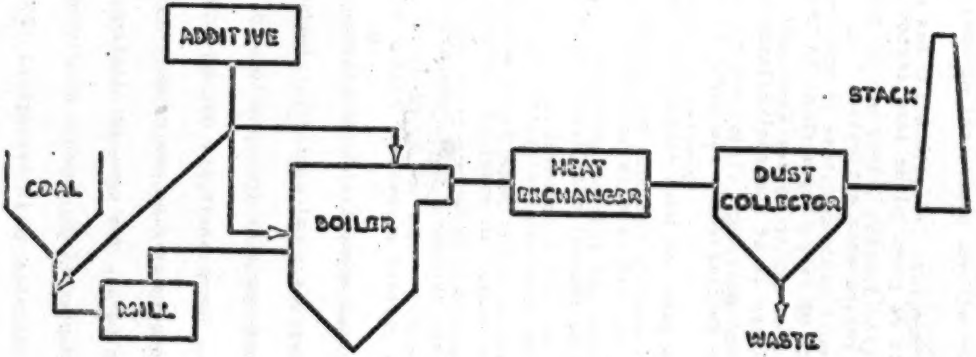


Fig. 4. Limestone Injection

5. Observe effects on power plant operation, including flame stability, heat transfer, slagging, corrosion, erosion, dust collector performance, problems in slaking calcium oxide, and water pollution.

6. Determine effect of power plant load factor on sorption.

7. Gather data to refine cost estimates.

8. Determine effect of recycling sorbent in the recirculating gas (one of the test boilers is of the recirculated-gas type).

Additive testing on smaller-scale equipment is being conducted elsewhere, but variables have not been controlled precisely, instrumentation has been lacking, and results have been erratic.

Applicability: While removal efficiency is not nearly as good as that expected from the more complex systems to be described later, the method may be useful in specific instances. Where the fuel sulfur content is not extremely high, where the plant load factor is low, or where partial removal of sulfur dioxide is sufficient to meet required ambient air conditions, the use of additives may be the most practical approach. Further, the use of additives may be the best solution for operators of commercial and industrial boilers. These units are not of sufficient size to accommodate the more complex flue gas processing systems.

Economic considerations: The cost of limestone injection, both for investment and operation, depends mainly on the amount of limestone used and the size of installation. Simply stated, however, the investment and operating costs for limestone injection

are about three and 10 percent, respectively, of normal power plant costs.

The main items in investment are the increased costs of dust-collection and waste-disposal equipment, representing about 25 and 20 percent of the total, respectively, for a 200-megawatt unit (3.5% S and 200% of stoichiometric limestone). For the operating cost, limestone (at $2.05/ton delivered) accounts for about 45 percent of the total, operation costs make up 24 percent, and capital charges 31 percent.

Conceptual design and economic studies conducted by TVA under National Air Pollution Control Administration contract indicate that the capital investment for the dry limestone injection process for an 800-megawatt power plant would be about $3 million and that the net operating cost when removing 40 to 60 percent of the SO_2 would be about $0.73 per ton. (Table 5)

Combustion Engineering's Limeston Injection Plus Wet-Scrubbing

Technical feasibility: Scrubbing of flue gases with alkaline solutions prepared from materials such as calcined limestone or dolomite, is a well-demonstrated method for removing sulfur dioxide. In one such process under development by Combustion Engineering, the additive is injected into the furnace of a boiler where it is converted by heat to calcium and magnesium oxide. (Figure 5) The oxides carry through the system with the flue gas to a turbulent

TABLE 5

PROJECTED COSTS FOR 800
MEGAWATT FLUE GAS SYSTEM

	Capital Cost $/KW	Owning and Operating Costs $/ton
1. Limestone Injection	3.75	.73
2. Combustion Engineering's Limestone Injection plus Wet-Scrubbing	8.21	.90
3. Bureau of Mines' Alkalized Alumina Adsorption	10.64	1.54
4. Monsanto's Catalytic Oxidation	20.60	1.75
5. Wellman-Lord's Sulfite Scrubbing	11.00	1.49

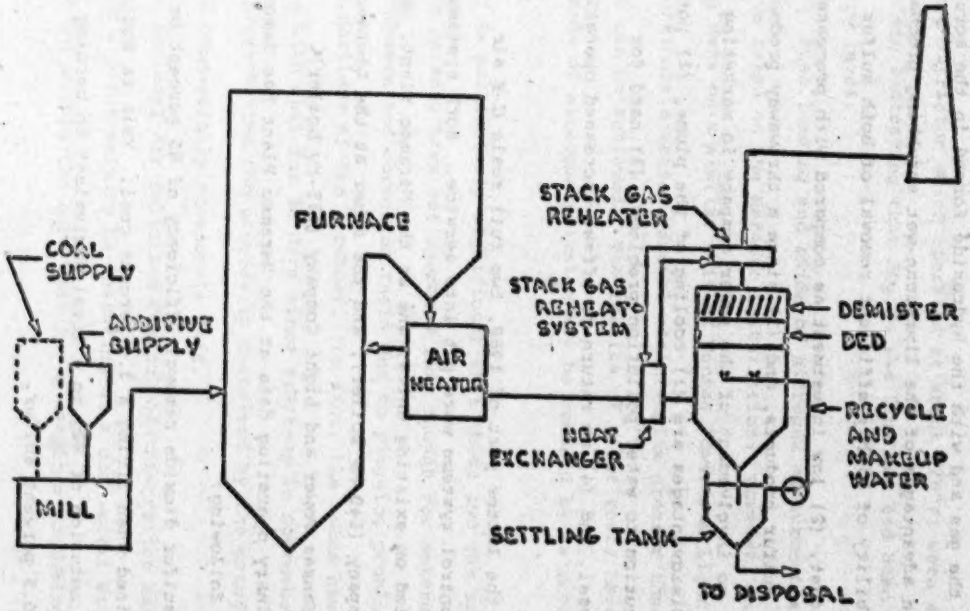


Fig. 5. Combustion Engineering's limestone injection plus wet-scrubbing.

contact absorber where, with water, they form a dilute slurry of alkaline hydroxides. Sulfur dioxide reacts both with the oxides suspended in the gas and with the hydroxide formed in the scrubber.

The main advantages of the limestone-wet scrubbing process are (1) capability of highly efficient removal of both sulfur dioxide and dust, (2) low investment as compared with processes that recover sulfur products, and (3) since a throwaway product is produced, no involvement of the power company in marketing problems. Disadvantages are (1) cooling of the plume, (2) potential contribution to water pollution problems, (3) need for solids disposal, and (4) no return to offset increased operating cost.

During the latter part of 1968, two full scale C-E air pollution control systems were put into service. Both systems were installed on existing units, one at the Meramec Plant, Union Electric Company (140-Mw boiler), and the other at the Lawrence Station of Kansas Power and Light Company (125-Mw boiler).

Preliminary operating data at the Meramec Plant has demonstrated the following:

1. A sulfur dioxide removal efficiency of 85 percent or more can be attained when firing a 3.4 percent coal. This is equivalent to reducing emission of SO_2 to a level equivalent to burning a coal containing 0.5 percent sulfur.

2. The steam generator can be operated with additive injection into the furnace. Low temperature surfaces, including the heat extractor which operated at about 220°F, were easily kept clean indicating that SO_3 in the flue gas had been reduced to a low level.

3. Dust loading and oxide of nitrogen measurements have not been taken on the Meramec installation. However, dust loading data on a similar unit at Kansas Power and Light indicate that particulate matter removal efficiencies greater than 99 percent can be achieved. The results of pilot tests have shown that oxide of nitrogen emission may be reduced by as much as 30 percent.

It is particularly significant that these two gas scrubbing units at Meramec have not operated long enough for determination of performance and corrosion tests due to plugging problems in various portions of the scrubber. In fact, the units have only operated with coal for 31 days since start-up in September 1968. At the present time the process is described by the manufacturer as not a commercially acceptable unit.

The National Air Pollution Control Administration has scheduled a pilot unit to be installed on a commercial size boiler (100-200 MW) within the next year for a wet lime scrubbing program.

(Figure 6) The test program will run 66 weeks to study additives and scrubber variables (using three scrubbers) and then will run an additional 30-50 weeks using optimum conditions for determination of erosion, corrosion, and maintenance factors. Specific variables to be studied include:

1. Variation of absorption efficiency with limestone type and with calcination conditions in the boiler.

2. Variation of absorption efficiency with scrubber type.

3. Effect of particle size on absorbent utilization. This is of particular interest for direct addition of limestone in the scrubber circuit.

4. Use of the delay tank principle in preventing scaling.

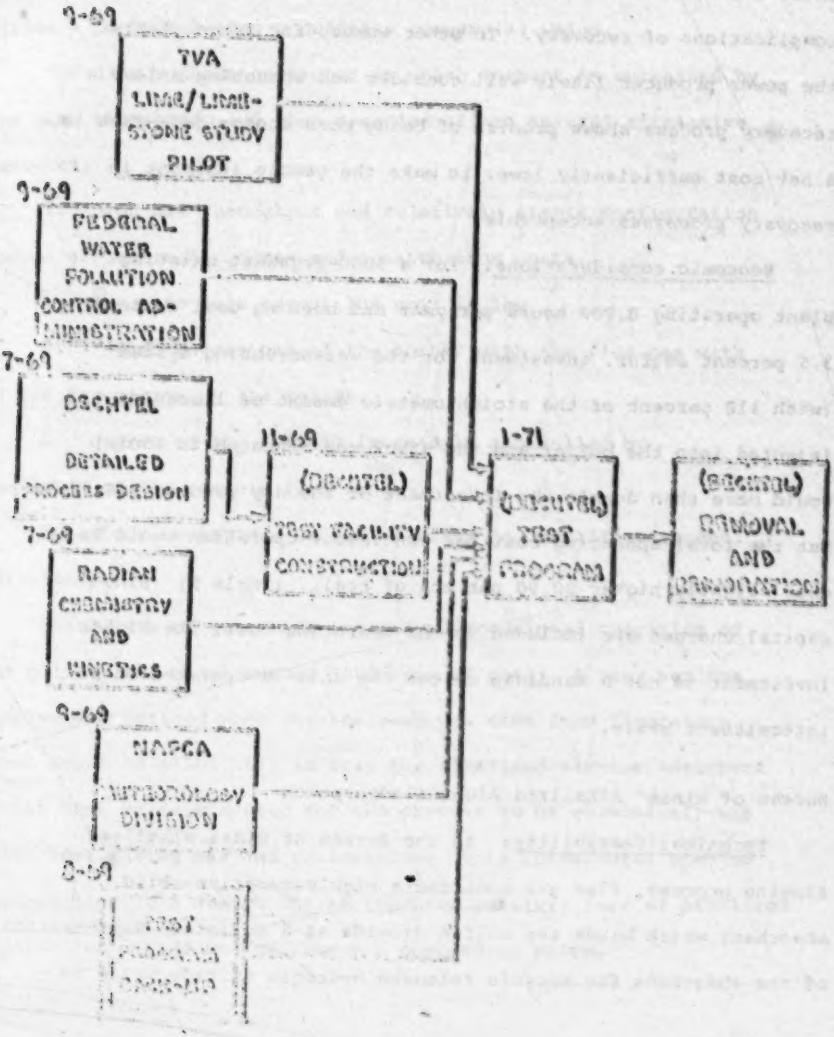
5. Corrosion in the system in extended operation.

6. Effect of oxidation promoters and inhibitors.

7. Chemical and physical properties of scrubber effluent.

Applicability: The wet process is more applicable to new plants since credit can be taken for elimination of dry dust collectors. Also the wet process requires considerably more space for waste water treatment.

The wet process becomes the basic method for comparing with recovery processes, which also are more appropriate for large baseload plants than for units operated intermittently. Because of the high and increasing cost of low sulfur fuel, limestone wet scrubbing will generally be the most economical method for sulfur


9-69
TVA
LIME/LIME-
STONE STUDY
PILOT
9-69
FEDERAL
WATER
POLLUTION
CONTROL AD-
MINISTRATION
7-69
BECHTEL
DETAILED
PROCESS DESIGN
7-69
RADIAN
CHEMISTRY
AND
KINETICS
11-69
(BECHTEL)
TEST FACILITY
CONSTRUCTION
1-71
(BECHTEL)
TEST
PROGRAM
(BECHTEL)
REMOVAL
AND
9-69
NAPCA
METEOROLOGY
DIVISION
8-69
TEST
PROGRAM
CONSULTANT

oxide control short of entering into the uncertainties and complications of recovery. In other words, for large plants the power producer likely will consider wet scrubbing unless a recovery process shows promise of being more economical--that is, a net cost sufficiently lower to make the gamble inherent in recovery processes acceptable.

Economic considerations: For a 1000-megawatt existing plant operating 8,000 hours per year and burning coal containing 3.5 percent sulfur, investment for the wet-scrubbing system (with 110 percent of the stoichiometric amount of limestone injected into the boiler and the stack gas reheated to 250°F) would more than double the investment of the dry process ($8.21/kw), but the total operating cost for continuous operation would be only slightly higher $0.90 per ton of coal. (Table 5) Since capital charges are included in the operating cost, the higher investment is not a handicap unless the unit is operated on an intermittent basis.

Bureau of Mines' Alkalized Alumina Adsorption

Technical feasibility: In the Bureau of Mines alkalized alumina process, flue gas contacts a highly-reactive solid absorbent which binds the sulfur dioxide as a sulfate. Regeneration of the absorbent for recycle releases hydrogen sulfide which is

converted to elemental sulfur. (Figure 7) Thus, the process yields a product having a definite commercial value.

The dilute phase contactor in which sorbent is entrained by the gas, separated, and then recycled offers several attractive features:

1. High gas throughput and relatively simple configuration reduce ground requirements and construction costs.

2. Pressure loss across the unit is low.

3. Flyash passes out of the sorber with the flue gas with little deposition on the solids.

4. Degree of SO_2 removal is readily controlled by variation of the recycle feed rate.

5. Minor variations in gas velocity do not affect removal efficiency.

The Bureau of Mines has recently discontinued operation of its pilot plant which burned 150#/hour of coal. A very serious problem was noticed when the scale-up was made from laboratory bench scale to pilot unit in that the alkalized alumina adsorbant (which must be regenerated for the process to be economical) was being lost during use and reclamation. This fundamental problem has resulted in a search for an improved particle form of alkalized alumina and withdrawal of research support by HAPCA.

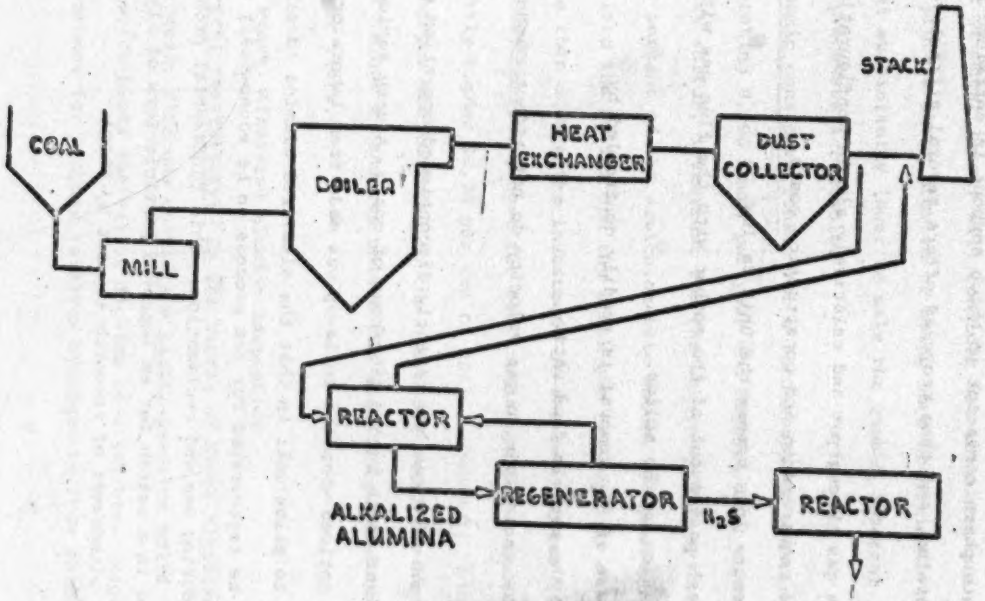


Fig. 7. Bureau of Mines alkalized alumina adsorption.

Applicability: A prototype unit and demonstration size plant would have to be operated successfully at a power plant before commercial applications would be considered.

Economic considerations: An evaluation in which capital and operating costs were estimated for removal of SO_2 from the flue gas of an 800 Mw powerplant was made by the Bureau of Mines prior to contruction of the pilot plant. It was assumed that 90 percent of the SO_2 generated by burning three percent sulfur coal with 20 percent excess air would be removed, and that the power plant would operate with a 90 percent load factor. Capital costs would total $8.5 million. The gross operating costs of $3,402,000 is equivalent to $1.54/ton of coal burned. (Table 5) Credit for recovered sulfur, at current prices, lowers the cost to about $0.50/ton of coal.

However, a recent study for NAPCA by M. W. Kellogg of conceptual design and cost analysis estimated a minimum operating cost of $3.60 per ton not including attrition loss of the adsorbent, not including generation of reducing gas, and not including the Klaus recovery plant. Because of these present economics and the technical problems, NAPCA is phasing out research funds for this sulfur oxide removal project.

Monsanto's Catalytic Oxidation

Technical feasibility: A more complex system of SO_2 removal

is catalytic oxidation. Monsanto, one of several companies researching this method, has developed a prototype system. (Figure 8) Hot furnace gases first pass through a highly efficient electrostatic precipitator (over 99.5 percent) where fly ash is removed. Gas from the precipitator is then passed through a converter where the SO_2 is catalytically oxidized to SO_3. Cooling is accomplished by using an economizer and air preheater which are designed to maintain the gas above its dew point. The SO_3 reacts with the water vapor in the flue gas and is condensed in a packed-bed absorbing tower as sulfuric acid at an average concentration of 80 percent. A mist eliminator then separates and collects the acid mist from the flue gas.

The feasibility of the Cat-ox system was established over seven years ago in a pilot operation at Pennsylvania Electric Company's Seward, Pennsylvania, generation plant. In mid-1967, Monsanto, in cooperation with Metropolitan Edison Company, began operation of a prototype plant built at the Portland, Pennsylvania, generating station. Although the facility has a generating capacity of 250 Mw, the prototype plant is designed to treat about 24,000 std. cu. ft./min. of stack gases which represents only about six percent of the total flue gas.

The major disadvantage to this process is that hot flue gases are required to produce catalytic conversion and the sulfur is

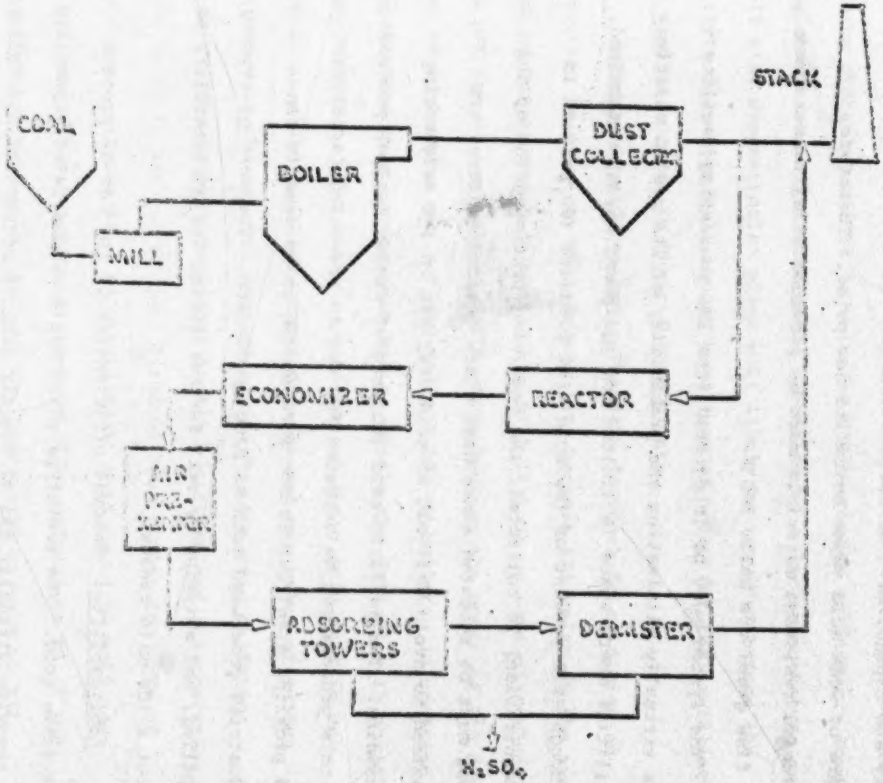


Fig. 8. Monsanto's catalytic oxidation.

removed in the form of a relatively weak sulfuric acid. High-temperature high-efficiency electrostatic precipitators are bulky and expensive. Of serious consideration is the corrosive nature of weak acid vapor below its dew point. Therefore, corrosive resistant materials must be provided in all areas where the flue gases are below 500°F.

The system must be integrated into the generating facility thus virtually eliminating the probability of its use in existing facilities where space is limited and equipment layout determined. Although 99.5 percent of the acid mist produced (80 percent in concentration) is collected, the remaining portion going up the stack must be reheated since high stack gas temperatures are required to avoid fall-out of acid droplets in the neighboring community. The sulfuric acid (80 percent concentration) produced by this process can be marketed for use in producing fertilizer and pickling steel but is not pure enough to be used in non-industrial processed such as drug production. The cost of storing, handling, and shipping by rail further limits its marketability to about a 100-mile radius.

Applicability: Removal efficiencies of the Cat-ox process are quite good. The prototype plant has a demonstrated capability of removing virtually all of the fly ash, 90 percent of the sulfur dioxide and over 99.5 percent of the sulfuric acid produced. This process would be applicable where high sulfur coal is used. In

theory, the larger the generating plant the more economical this system becomes. Projected power generating figures indicate that by 1980 a little over half the total electric capacity in the United States probably will be in units of 600 megawatts or larger. However, the construction and successful operation of a larger prototype or full size demonstration plant will likely be required before the utility companies will invest huge sums of money for the installation of similar systems in their future plants.

Economic considerations: The main drawback to oxidation or reduction in place is high investment, because all units of the system must be large enough to handle the full 12 tons or more of combustion gas per ton of coal burned, or a throughput on the order of 110,000 tons of combustion gas per day for a 1,000 Mw boiler. In contrast, only the absorber or scrubber has to handle the full flow in sorption-type processes. The netback price for sulfuric acid sold is dependent on plant location, local demands and the value of sulfur. For example, the capital cost of an 800 Mw catalytic oxidation installation has been estimated at $16.5 million and the operating costs at $1.75 per ton of coal fired without credit for sale of byproduct. (Table 5) If the sulfuric acid could be sold for $9 per ton, the net operating cost would be reduced to $0.72 per ton of coal fired or to $0.38 if the acid could be sold at $12 per ton. However, the fluctuation in acid prices and the

uncertainty of the long-term market detracts from its strongest selling point--namely, the full or partial recovery of operational costs through the sale of sulfuric acid.

Wellman-Lord's Sulfite Scrubbing Process

Technical feasibility: The highly secretive Wellman-Lord sulfur dioxide recovery process reportedly represents a new approach in the field of air pollution control; however, it bears some similarity to the catalytic oxidation and the aklalized alumina process. (Figure 9)

In this process the sulfur-laden flue gases are first cleaned in a high-temperature high-efficiency electrostatic precipitator and then passed through a noncatalytic reactor which is continuously washed by a reactive solution. The residual particulate matter and sulfur trioxide adhering to it are trapped in the solution and removed by a continuous blowdown. The sulfur dioxide is disolved in the process solution which is sent to a stripping column where steam is added to release the sulfur dioxide as a wet gas of very high purity. The wet SO_2 vapor is compressed and recovered as pure liquid SO_2 from a rectification tower.

The process was only conceived in mid-1966 and a pilot plant was installed early in 1968 at the Cannon station of the Tampa Electric Company where it is in operation at the present time. A 23 MW plant processing 60,000 ACFM flue gas was started up early

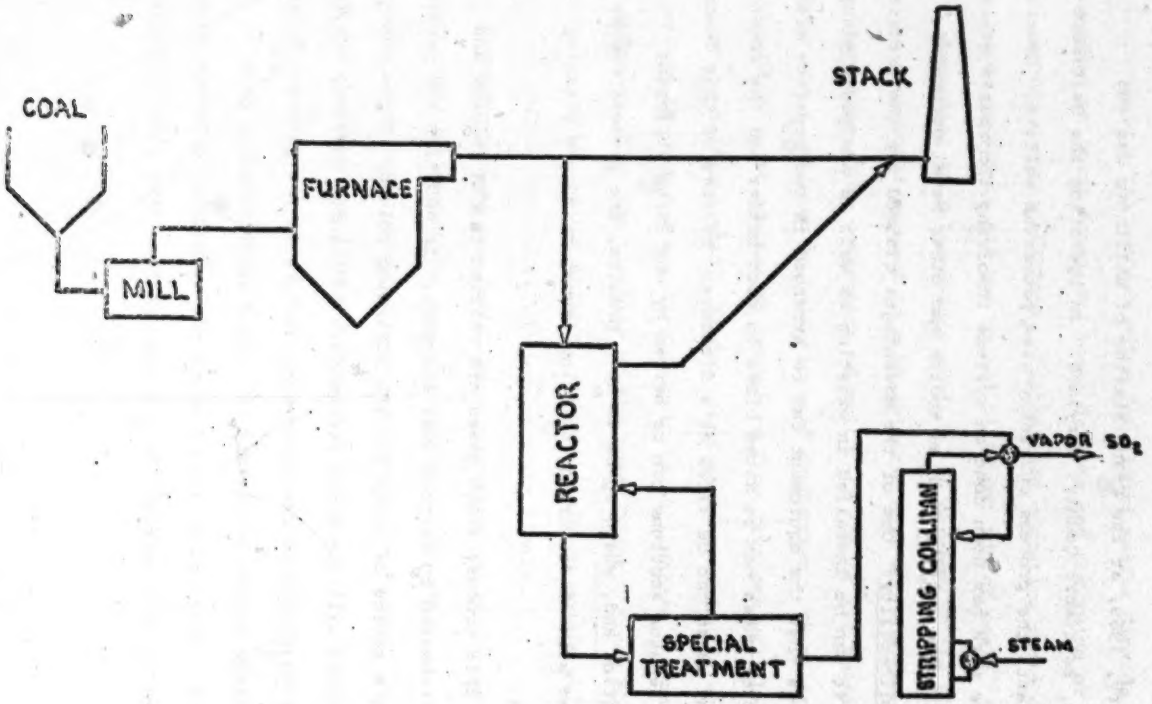


Fig. 9. Wellman-Lord SO_2 Recovery Process.

in January, 1969, at the Crane station of Baltimore Gas and Electric, Baltimore County, Maryland. In operating the Baltimore pilot plant, the process currently uses potassium sulfite. However, extensive work has been done on systems involving absorbants other than potassium sulfite such as sodium and other metal compounds.

Applicability: One of the advantages claimed for the process is that it can be installed in existing as well as new power plants. Another is that the equipment can be arranged in two separate areas. The reactor phase can be sited close to each boiler and the chemical stripping phase can be sited at a distance. Because of this feature several reactor sections can be served by one large stripping installation and, where space is at a premium, the process can be installed without disturbing existing layout or future planning programs.

In this process stack gases are chilled in the reactor and must be reheated to restore lost buoyancy. In addition the process requires a source of steam for the stripping column. These energy requirements will therefore necessitate additional auxilary boilers in existing plants or oversized main boilers in new plants. Another disadvantage is the production of liquid sulfur dioxide as a byproduct. Most utility managements are reluctant to become engaged in marketing this product for the same reasons they dislike marketing

sulfuric acid. The netback price for liquid sulfur dioxide is dependent on plant location, local demands and the value of sulfur.

Economic considerations: Capital and operating costs are estimated at $10 to $11 per Mw and $1.49 per ton of coal. (Table 5)

According to Wellman-Lord studies, 85 percent of the sulfur in the free world is used to make sulfuric acid and the percentage is increasing. The conversion of sulfur to SO_2 or the receipt of SO_2 is the first step in sulfuric acid production. Thus, it is assumed that most of the SO_2 recovered from flue gas will be used to produce sulfuric acid. As described earlier, sulfuric acid is expensive to ship and may be difficult to sell unless it can be disposed of in the vicinity of the power plant. Since the process is still in its infancy, further scale-up models will be required before commercial applications are likely.

Within the next ten years, many processes for sulfur oxide removal will be tested and further developed. However, it is unlikely that many commercial applications will be made. Of the five first-generation flue gas desulfurization methods discussed in this report, two (wet and dry limestone injection) do not produce usable byproducts whereas the remaining three produce various sulfur bearing byproducts. For continuous operation in base load plants the wet scrubber is more desirable due to its

higher efficiency of sulfur oxide and dust removal. For existing small generating plants the dry limestone injection offers more potential. However, both processes are still being developed by the National Air Pollution Control Association and many questions remain to be answered before commercial applications can be expected.

When comparing the three flue gas processing methods which produce a byproduct, the Monsanto cat-ox system is considered technically ahead of the other two. It is, by far, the most expensive to install and operate even though all three require heavy capital expenditures. Also all three methods produce a sulfur byproduct that would force the steam-electric utility's management into becoming chemical producers. Since sulfur and sulfuric acid prices constantly vary, utilities are not likely to readily accept these processes. The alkalized alumina process in theory is very promising since its proposed byproduct is elemental sulfur. However, this method developed serious problems when tested at the pilot plant level and development work has been drastically reduced. The Wellman-Lord Sulfite Scrubbing process seems the most economical but this process is still in its infancy and will require years of testing from its present small scale facilities before commercial installations will become reality.

Over the long term, it is reasonable to expect that planning for large new steam-electric plants will consider the need for

reducing sulfur oxide emissions as well as for removing particulate matter which is common today. Such planning will likely take into consideration the economics of alternate fuels, alternate fuel cleaning procedures, and stack gas cleaning methods.

CONCLUSION

In sum, coal consuming facilities in most industrial areas in the midwest will be increasingly forced to take positive action to control or indeed eliminate sulfur oxide emissions. For many, conversion to other fuels will represent the only practical means of compliance. For other energy users, the cost and time tables of abatement strategies discussed in this report will be carefully weighed before final decisions are made as to fuel or energy source and location of facilities. Over the next 10 years, air pollution limitations will have a serious impact upon coal's marketing patterns and its share of energy markets. Beyond that period, such limitations may well continue to constitute an important competitive handicap to coal's ability to compete with other energy sources.

REFERENCES

PART I

1. "Regulation of Sulfur Oxide Emissions from Federal Facilities," U. S. Department of Health, Education, and Welfare, November 1966

2. Federal Power Commission Docket No. CP63-204, et al, Washington, D. C.

3. Federal Power Commission Docket No. CP65-181, Washington, D. C.

4. Title 42 - PUBLIC HEALTH, Chapter 1 - Public Health Service, Department of Health, Education, and Welfare, Subchapter F, Quarantine, Inspection, and Licensing, Part 76 - Prevention, Control, and Abatement of Air Pollution from Federal Government Activities; Performance Standards and Techniques of Measurement (F. R. June 2, 1966)

5. Executive Order 11282, "Control of Air Pollution Originating From Federal Installations," May 26, 1966

6. "Air Quality Act of 1967"

7. Senate Report 403, 90th Congress

8. Community Affairs Bulletin, National Air Pollution Control Administration, April 1, 1969

9. Personal communications with officials of each state agency, June 23, 1969

PART II

1. "Crude Petroleum and Petroleum Products," Bureau of Mines Minerals Yearbook 1967, Washington, D. C. 1968

2. "Burner Fuel Oil Surveys, 1967," Bureau of Mines, Washington, D. C. 1968

3. Federal Power Commission Reporting Form 67, 1968, Washington, D. C. 1968

4. Federal Power Commission Docket Nos. C968-220; C968-222, Opinion No. 558, Washington, D.C.

References, cont'd.

5. "West Central Region Power Survey 1970-1990," Federal Power Commission, Washington, D. C. June 1969

6. "Nuclear Power Plants in the United States," U. S. Atomic Energy Commission, March 1969

7. "Air Pollution and the Regulated Electric Power and Natural Gas Industries," Federal Power Commission, Washington, D. C. September 1968

8. "Control Techniques for Sulfur Oxide Air Pollutants," U. S. Department of Health, Education, and Welfare, National Air Pollution Control Administration, Arlington, Virginia, January 1969

9. "The Removal of Pyrite from Coal," by R. D. Saltsman, Publication No. 68-WA/FU-2, American Society of Mechanical Engineers, New York, N. Y., December 1968

10. "Sulfur Removal from Coal," Coal Research No. 32, Bituminous Coal Research, Inc., Monroeville, Pa., 1969

11. "Office of Coal Research Utilization Processes as related to Air Pollution Control," by George I. Staber, Publication No. 68-F-40, Society of Mining Engineers of AIME, New York, N. Y., February 25-29, 1968

12. "Office of Coal Research Annual Report," United States Department of the Interior, Washington, D. C., January 1969

13. "Coal Gasification Reaches the Pilot Plant," Coal Research No. 31, Bituminous Coal Research, Inc., Monroeville, Pa., Autumn, 1968

14. "IGT to Build Coal Gasification on Plant," AGA Quarterly Review, Vol. 19, No. 2, American Gas Association, New York, N. Y., April 1969

15. "Gasoline-from-Coal Pilot Plant Dedicated," Coal Research No. 27, Bituminous Coal Research, Inc., Monroeville, Pa., Summer 1967

References, cont'd.

16. "Office of Coal Research Projects for Producing Hydrocarbons from Coal," by George Fumich. Presented at the Annual Meeting of the American Institute of Mining and Metallurgical Engineers, New York, N. Y., March 1, 1966

17. "Sulfur Oxide Removal from Power Plant Stack Gas - Sorption by Limestone or Lime Dry Process," Tennessee Valley Authority, 1968

18. "Sulfur Oxide Removal from Power Plant Stack Gas - Use of Limestone in Wet Scrubbing Process," Tennessee Valley Authority, 1969

19. "Operating Experience with Wet - Dolomite Scrubbing," John F. McLaughlin, Jr., and J. Jonakin. Presented at the Sixty-second Annual Meeting Air Pollution Control Association, New York, N. Y., June 22 - 26, 1969

20. "The Alkalized Alumina System for SO_2 Removal: Design and Operation of a Continuous Pilot Plant," by D. G. McCrea, J. H. Field, E. R. Bauer, Publication 68-WA/FU-3, American Society of Mechanical Engineers, New York, N. Y., December 1968

21. "How Much Will Pollution Control Cost You?", Carl Dennis, Electric Light and Power, p. 84, 85, June 1969

22. "Applicability of Aqueous Solutions to the Removal of SO_2 From Flue Gases," Aerojet-General Corporation. Presented at the Second Semiannual NAPCA Control Process Contractor's Meeting, Cincinnati, Ohio, June 11-13, 1969

23. "Economic Factors in Recovery of Sulfur Dioxide From Power Plant Stack Gas," A. V. Slack, G. G. McGlamery, H. L. Falkenberry. Presented at Sixty-second Annual Meeting Air Pollution Control Association, New York, N. Y., June 22-26, 1969

24. "The Catalytic-Oxidation System for Removing SO_2 from Flue Gas," J. L. C. Bachofer and J. S. Bartman, Publication No. 68-WA/APC-2, American Society of Mechanical Engineers, New York, N. Y., December 1968

25. "Wellman-Lord Sulfur Dioxide Recovery Process," J. D. Terrana, Wellman-Lord, Inc., Lakeland, Florida, 1968

26. "Wellman-Lord SO_2 Newsletters," Nos. 1, 2, and 3, Wellman-Lord, Inc., Lakeland, Florida, 1969

	1969	Change Since 1968	Average Annual Change Since 1964[1]
Net Income on Common Stock	$126.1 million	up 0.8%	up 4.8%
Earnings per Common Share	$3.00	up 0.3%	up 4.6%
Cash Dividends Paid per Share	$2.80	—	up 8.7%
Electric Operating Revenues	$801.1 million	up 7.8%	up 6.4%
Average Residential Revenue[2]	2.53¢/kwh	down 1.2%	down 1.7%
Sales to Ultimate Consumers	42.9 billion kwh	up 8.1%	up 7.8%
Average Residential Use	5,174 kwh	up 6.9%	up 7.0%
Electric Customers at December 31	2.54 million	up 2.2%	up 1.7%
Peak Load	9.27 million kw	up 3.6%	up 8.4%

(1) Central Illinois Electric and Gas Co. figures included for periods prior to the December 8, 1968 merger.
(2) Excludes light bulb service.

868

How to preserve our air, water and land is the question of the day. Our public is concerned and so are we. We also are concerned in the public interest about an adequate and uninterrupted supply of energy. We know from experience that the public demands it.

Because of these concerns I feel I should give you my views as to how electric power supply should be handled in the long-term future to minimize intrusion upon our environment.

First, large generating complexes should be located away from urban areas. These complexes can make use of several power sources. They may be fossil-fired, present-day nuclear machines, or breeder or fusion reactors. Nuclear units and their successors will be in every way fine neighbors. Quiet. Absolutely safe. No long strings of coal cars. Not a trace of smoke or soot. And designed to satisfy tough water temperature standards.

These generating complexes should be linked to each other and to city and industrial load centers. The result will be a grid with stations and transmission lines of great capacity.

Huge power demands require big units and big interconnecting lines. Even with our present technology we are building them with almost no adverse ecological effect. Fortunately, such a bulk power system is not only the most reliable but also the most economical. This means smaller power systems may increasingly choose not to make their own electricity, but instead to buy it from larger complexes built by larger companies. Law and custom may resist this, but technology, economy and environment may require it.

In our business, we must plan and begin construction years ahead of need. To anticipate public wishes in a timely way, we can accent one or another of the environmental alternatives which technology and economy allow. But stations cannot be rebuilt overnight. New nuclear units do not spring magically from the ground. Fuel sources take time to develop and to modify. Nevertheless, we have done much quickly, and we shall do more soon. We will eliminate our share of pollution in just as short a period as meeting our electrical commitments to the people of Illinois will allow.

And there is no doubt in my mind that we will furnish power in the future in a way that makes northern Illinois a better place in which to live.

Sincerely,

J. Harris Ward
Chairman

1969 Review

Earnings, dividends flat
Our earnings for 1969 were $3.00 per common share, virtually unchanged from 1968's level of $2.99 or 1967's $2.98. Net income on common stock totaled $126 million, about the same as that of the prior year.

Dividend payments during 1969 were $2.20 a common share, the same as in 1968, and only 10 cents more than in 1967. This leveling off in earnings and dividend growth contrasts with good increases in the preceding years.

Stockholders are entitled to a competitive return on their investment. To supply this and to compete effectively in the money markets, we require a rate increase.

Good sales performance
This need for rate relief is not caused by lagging sales growth. During 1969, each of our four major classifications of kilowatthour sales and revenues had fine increases. Electricity sales to ultimate consumers increased 6.1 percent over 1968, and related revenues had a 7.8 percent gain. These compare with average annual increases of sales and revenues during the 1960's of 7.4 and 5.4 percent. It is nice to close out the soaring sixties with increases which are well above average for the decade. We are confident about Edison's ability to continue to increase—at a good pace—its sales and revenues during the 1970's.

At December 31, we had 2.54 million customers on our lines, 2.2 percent or 55 thousand more than at the end of 1968.

1969 Revenues and Sales	Electric Operating Revenues (thousands)	Increase Over 1968	Kilowatthour Sales (millions)	Increase Over 1968
Residential	$303,981	7.9%	11,835	9.2%
Small commercial and industrial	286,199	6.0%	13,378	6.6%
Large commercial and industrial	139,443	10.2%	13,781	9.4%
Public authorities	48,050	9.0%	3,988	8.8%
Electric railroads	5,355	—	385	—
Ultimate consumers	$783,028	7.8%	42,933	8.1%
Sales for resale	9,767		1,454	
Other revenues	7,754			
Total	$801,149		44,387	

Expenses up $47 million
Electric operating expenses during 1969 totaled $426 million, $47 million or 12.4 percent higher than last year. $26 million of the increase was due to higher fuel and purchased power expenses. This was a result of having to buy higher cost fuel and more of it, and—among other purchases—of having to import power to cover Dresden 2's delay.

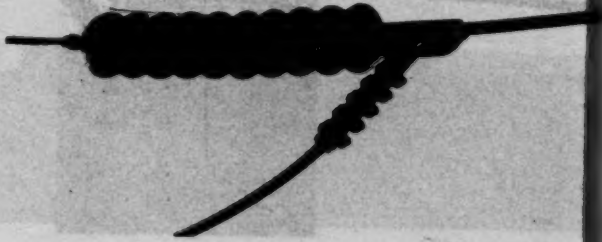
Other operation and maintenance increased $12 million or 7.6 percent, due mainly to higher payroll costs. Added plant pushed depreciation expense up $7 million or 7.4 percent.

Taxes cut earnings
During 1969 we paid or set aside $207 million in state, federal and local taxes of all kinds and sizes.

A burdensome new 1969 tax was the Illinois income tax, levied at 4 percent for corporations. The state income tax was effective on August 1 and cost stockholders 3 cents per share on 1969 earnings. We estimate the 1970 effect to be on the order of 8 cents. On the other hand, reduction in the federal income tax surcharge should help to offset 1970 increases in taxes and other operating costs.

1969 Electric Operating Expenses	1969 (Thousands)	Increase Over 1968
Fuel and purchased and interchanged power (net)	$154,381	22.2%
Other operation and maintenance	170,615	7.8%
Depreciation (straight line)	100,941	7.4%
Total	$425,937	12.4%

Power for People in the '70's is the theme of this report. Edison facilities, like this strain insulator, tie together the vital activities of northern Illinois. Shown here are a man on Ford's Chicago assembly line, one of our nuclear plants under construction, and Amoco's refinery near Joliet.



Interest costs jump 28%
Interest charges on debt during the year were $62 million, up $13 million or 26 percent over 1968. This big increase was due to new bond issues and interim short-term financing at record-breaking interest rates. Regardless of capital costs, we must raise the money required to carry out our construction program. We expect another sizeable increase in interest costs during 1970.

Progress on rate request
On August 15, 1969 we filed with Illinois Commerce Commission proposed new rates which provided for a 6.1 percent revenue increase. The Commission must render a decision within 11 months of initial filing or, in our case, by July 13, 1970. We, of course, hope for an earlier ruling and are doing all we can to hasten the hearings.

Under Illinois law, we are entitled to rates which give us the opportunity to earn a fair return upon the fair value of our plant. Establishment of fair plant value involves among other things "the fair consideration of current price levels, . . . the ultimate purpose being to determine and allow a fair return to the owners . . ." Fair value is less than today's replacement cost, but it ought to be substantially more than original cost. In these inflationary times, fair value is a far more just standard than original cost.

We do not like rate increases because they impair our ability to compete in the energy market. Indeed, in the 1960's we reduced our customers' rates time after time. However, inflation has more than counterbalanced our cost-control efforts, and we have reluctantly applied for a rate increase.

Why rate relief vital
The captions in this annual report tell the story: "Earnings, dividends flat", "Expenses up $47 million", "Taxes cut earnings", "Interest costs jump 56%", "Plant budget up $250 million", "$386 million for 1980 construction", "$1 billion of new securities needed", "Wages up 6%, benefits higher". The pressures of rising expenses are heavy and have in turn leveled our earnings.

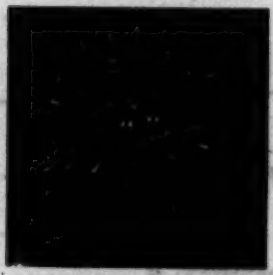
Our business is growing rapidly and we must expand our facilities to serve it. But since 1963, our generating station construction costs per kilowatt have risen by up to 80 percent, and interest rates have nearly doubled. We must meet expanding load commitments with far more expensive new facilities. The result is the largest construction budget in our history which must be financed at near-record interest rates.

Today's investors require far higher returns than they once did, and we must pay their price to use their money. To attract capital we need greater earnings. In short, we need a rate increase.

A modest request
A 6.1 percent rate increase request is modest. Other electric power companies around the country have asked for far more. We did not request 6.1 percent in the hope of getting something less. Instead, we asked only for the amount we must have, and we hope to receive that amount in full.

Preserving Lake Michigan
Clean air and water is an idea whose hour has come. The center insert of this report outlines what Edison is doing to reduce pollution. We are deeply concerned, and recognize that others are, too. Not all concerns, however, have equal basis in fact, and a recent example of this has to do with Lake Michigan.

These finely machined control rod drive housings in an Edison nuclear plant help provide electricity to people in farms and homes across our 13 thousand square mile service area.



Zion safe for lake
Two suits were brought last fall to halt construction of our Zion Nuclear Power Station. Each claimed that Zion would damage Lake Michigan. Zion Station will not harm Lake Michigan.

Zion Station is being built under rigorous Atomic Energy Commission standards. The water returned to the lake at Zion will be safe. In fact, insofar as radioactivity is concerned, one could drink it for a lifetime without harm.

Our extensive studies indicate that fish and plant life will not be injured. Indeed, one of the best fishing spots in our area is off our Waukegan plant, south of Zion. The amount of water passed daily through Zion's sealed condensing system will be roughly equivalent to circulating one pint of tepid water in a good sized swimming pool.

The temperature of the water returned to the lake will be under 85 degrees, meeting the limits set by the State of Illinois and approved by the U.S. Department of the Interior. Indeed, the Federal Water Pollution Control Administration has stated that the combined annual effect of all existing plants plus all proposed nuclear plants on Lake Michigan would raise overall lake temperature by less than 1/10th of one degree Fahrenheit. Even this small rise tends to cancel out each winter. Interestingly, the average annual temperature of the lake has actually dropped about two degrees in the past century.

Gas negotiations begin
In December, Edison made a joint announcement with Northern Illinois Gas Company that negotiations were under way for acquisition of our subsidiary, Mid-Illinois Gas Company.

We have been approached by several companies in addition to Northern Illinois. Since we have a valuable commodity, we expect to be able to make an agreement which is fair to our stockholders, protects our gas employes, and is in the public interest. We anticipate that arrangements will be completed during 1970.

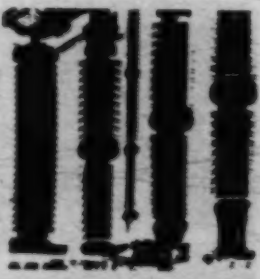
CILCo merger talks ended
During 1967 and 1969, we conducted talks with Central Illinois Light Company on the possibility of merger with Edison. In June, 1969 we made an offer which would have allowed CILCo's common stockholders to elect securities giving them premiums of over 85 percent on income and 25 percent on market price. In October, CILCo's management rejected our terms and broke off negotiations. We do not expect the talks to be reopened.

Peak summer load
A record peak load of 8.3 million kilowatts was set July 16. This was only a 3.5 percent increase over 1968's highest load, compared with an unusual 17 percent rise between 1967 and 1968. Because of the variability of summer weather, we have come to expect that heat sensitive loads will not march evenly upward year after year.

On the average, however, our summer peak loads are growing at over 8 percent each year. To meet them our engineers, purchasing and construction people must plan, buy, build and bring into effective service hundreds of millions of dollars worth of new plant each year. The range between extravagance and perfect investment economy on a system the size of Commonwealth Edison's must surely exceed several hundred millions of dollars. For example, last fall a national magazine estimated that by purchasing four nuclear units at fixed prices Edison had saved "about $300 million."

Fast-start peaking units
During 1969 we placed on our system 535 thousand kilowatts of fast-start peaking capacity, bringing our total of such equipment to 1.34 million kilowatts, more than any company in the country. An additional 360 thousand kilowatts have been ordered for 1970 service, though about 200 thousand kilowatts may miss the summer peak due to the General Electric strike.

Homes are heated with the help of these insulators at one of our 135 transmission substations.



Generating capacity additions

Unit	Type	Scheduled for	Net Capacity (kilowatts)
Dresden 2	Nuclear	Spring '70	809,000
Peaking	Gas & Oil	Spring, Summer '70	360,000
Dresden 3	Nuclear	Winter '70-'71	809,000
Quad-Cities 1	Nuclear	Spring '71	809,000*
Quad-Cities 2	Nuclear	Spring '72	809,000*
Zion 1	Nuclear	Spring '72	1,100,000
Powerton 5	Coal	Spring '72	840,000
Zion 2	Nuclear	Spring '73	1,100,000
None	—	'74	—
None	—	'75	—

*Iowa-Illinois Gas and Electric Company has a one-quarter ownership interest in the two Quad-Cities units.

These machines are economical for meeting short periods of peak demand because their low capital costs offset their higher fuel costs. They burn gas or oil and can be brought on line in small increments on short notice. Perhaps best of all, the fast-start units allow us to retire smaller coal-fired boilers around the City of Chicago, and thus contribute to our efforts to curb air pollution.

First big nuclear unit

This spring Dresden 2, the first of our large second generation nuclear units will be placed in commercial service, and should be starting up as you read this report. Dresden 2 has an ultimate capacity of 809 thousand kilowatts and will be followed within about a year by two more nuclear units, Dresden 3 and Quad-Cities 1.

These plants must meet rigorous construction standards before being granted an operating license by the Atomic Energy Commission. Because of the care with which they have been built, we expect them to be absolutely safe, and more reliable than any of our large coal-fired units. Nuclear units produce electricity without smoke, soot or dust, and are, therefore, the keystone of our clean air program.

Pumped hydro power

Nuclear generation also fits well with pumped hydro generation. We are negotiating with Consumers Power and Detroit Edison for a 624 thousand kilowatt share of their Ludington, Michigan pumped hydro generating plant. It would be purchased under a long-term agreement beginning in 1974.

Electrical demands are lower at night and so nighttime energy is most economical for us to produce. During the night, energy from our nuclear units would be employed to pump water to an elevated storage reservoir on the eastern shore of Lake Michigan. During daylight hours the water would be released, electricity generated, and the energy returned to us over high voltage transmission lines.

Skilled people controlling intricate machines—computers, airplanes and Edison junction boxes—make our electrified urban society possible.

On average, about three off-peak kilowatthours would be used up for every two on-peak kilowatthours generated. However, high daytime and low nighttime demands plus around-the-clock loading of our nuclear machines make the transaction an economic one. Also, this and other power purchase agreements will allow us to forego construction of any major generating units for 1974 and 1975 service.

In the nearer term, purchased power contracts, strong interconnections, our fast-start peaking units, and the larger units coming on in the early 1970's should provide adequate reserve margins for meeting the needs of our northern Illinois service area.

Plant budget up $200 million

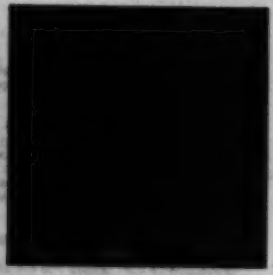
For electric generating units, transmission lines, distribution facilities and other plant, we plan to spend $1.95 billion during the five years 1970 through 1974. This compares with $1.7 billion budgeted for the period 1969–1973.

The increase from $1.7 to $1.95 billion for the different budgeting periods results in part from the strong sales growth we expect. However, inflation and environmental considerations also play their parts.

The new $1.95 billion budget includes expenditures of $320 million in 1970, $470 million in 1971, $305 million in 1972, $280 million in 1973, and $375 million in 1974.

The totals after 1971 are somewhat lower than they would otherwise be because no major generating units are scheduled to begin service in 1974 or 1975. Allowance has been made, however, for initial outlays for construction of 1976 and 1977 units.

A man involved in his work and a steel furnace ladle are both served by graceful 138 thousand volt transmission lines.



Air Pollution in the Chicago Area

What Commonwealth Edison is doing to help reduce it, and what we will do, and when.

"... everybody—beginning with ourselves—must do more to make our city, our nation, our world, a better, brighter, sweeter (and not just richer) place for us and our children to enjoy."

Air pollution is a serious matter, for all citizens in every city, in every developed country in the world.

It is too serious to become a political football, or an emotional and partisan issue, or a platform on which companies can thump their chests and proclaim their virtue and good citizenship. Deeds, not words, are what the public is looking for—and has a right to get.

Commonwealth Edison has already spent $63 million on facilities to prevent contaminants from getting into the air; and is spending hundreds of millions on new nuclear stations which add *no* fumes or dirt to the air.

But it is beside the point that we have spent "x" millions of dollars, and committed millions more.

What *is* important is not so much what we have done as what we will do. We recognize the gravity of the problem, and accept the plain fact that everybody—beginning with ourselves—must do more to make our city, our nation, our world, a better, brighter, sweeter (and not just richer) place for us and our children to enjoy.

The Rules We Live By

Years ago, Commonwealth Edison decided that we had these obligations to the community:

1. To provide the amounts of electricity needed, where needed and when needed, within the area we serve, and reserve margins to handle emergency conditions.

2. To do this at the lowest possible cost to the consumer.

3. To anticipate future needs, often involving years of lead-time for the manufacture and installation of necessary facilities.

4. To do all this while minimizing actual and potential pollution.

". . . the waste particles which people call 'smoke' can be almost entirely prevented from escaping into the air . . ."

Electric Power and Air Pollution
Commonwealth Edison produces and distributes the electricity on which practically every home, office, store, and industry in our entire area depends.

Our product heats and air-conditions the 100 story John Hancock Center and runs the elevators that make such a building possible. It lights your home, operates your TV set, and may even brush your teeth.

Electricity must be always on tap, day or night, at the flick of a switch. It can't be stored until you need it. Most people have come to take it for granted.

How does Commonwealth Edison produce electricity? Chiefly by heating water in giant boilers to make steam power, which turbines and generators convert into electric power.

We have three types of boilers: coal-fired, natural gas or oil-fired, and nuclear-powered.

Nuclear reaction emits no fumes or smoke. Natural gas or oil burning releases some, but not much. Coal burning releases more, including sulfur oxides, but the waste particles which people call "smoke" can be almost entirely prevented from escaping into the air by the use of modern electrostatic precipitators.

Before
This stack at our Joliet Station has its electrostatic precipitator disconnected to show how much smoke would escape.

After
Soon afterward this unretouched photo shows the unit still in full operation—but with its modern precipitator connected.

". . . we account for less than 5 percent of all contaminants in the air you breathe."

Our Plan of Action
1. To cut in half, within the near future, the amount of coal we burn in and around Chicago, and then to reduce it still more.

2. To continue to improve our electrostatic precipitators. Our goal is to try to have every precipitator prevent 98 percent or more of waste particles from the coal we burn from getting into the air.

3. To increase as rapidly as possible the share of nuclear power in our total production.

4. To use all the natural gas we can get. To introduce new low-sulfur oil. And to continue our efforts to obtain and burn low-sulfur coal.

Here are details of our Plan of Action:

1. We Are Reducing the Amount of Coal We Burn
The best way for us to help reduce air pollution is to burn less coal. This is not easy when the demand for electricity continues to grow.

Still, this is what we are achieving:

	Coal (million tons) burned in Chicago area	Electricity (billion kwh) used in Chicago
1965	8½	14
1970 (Est.)	4	18
1975 (Est.)	3½	24

These reductions are made possible in part by our nuclear program and by converting an entire generating station from coal to low-sulfur oil.

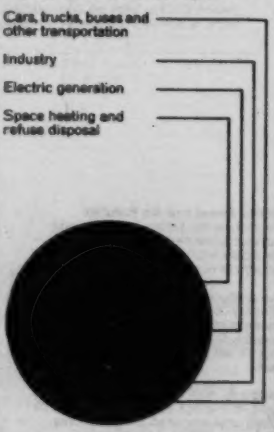
Also, within the last two years we have installed 1.24 million kilowatts of fast-start generating units (another 360 thousand in 1970), which burn only gas or oil and will permit retirement of an entire Chicago coal-fired station.

2. We Are Installing More and Better Precipitators
Commonwealth Edison began installing precipitators as long ago as 1929. They have been steadily improved to reach their present levels of efficiency. The newest electrostatic precipitators prevent all but a small amount of the "particulates," or waste particles from the coal we burn, from getting into the air.

All coal-fired boilers in our metropolitan area stations are equipped with precipitators. We have a few precipitators left that are not yet 98 percent efficient, but we're working hard to finish upgrading them.

We have retired 47 coal-fired boilers in Chicago within the past ten years. We presently plan to have only nine left in Chicago by the end of this year.

Sources of Air Pollution
The principal sources of air pollution nationally, according to an authoritative report by the National Academy of Sciences ("Waste Management and Control"), are about as follows:



These are national figures. In the case of Commonwealth Edison, although we burn two-thirds of all the coal burned in the Chicago area, our control and dispersion methods are so effective that we account for less than 5 percent of all contaminants in the air you breathe. Included in this 5 percent figure are sulfur oxide emissions. Most of the ground-level sulfur oxides come from homes, stores, factories and apartment buildings which lack the tall stacks of our stations.

"Commonwealth Edison is complying, and will continue to comply in full, with all government laws and regulations on air pollution . . ."

3. We Are Rapidly Increasing Our Nuclear Production of Electricity
Commonwealth Edison pioneered in the development of nuclear power nearly 20 years ago. Our first nuclear unit has been operating successfully at Dresden for ten years.

We now have six large nuclear units under construction, two each at Dresden, Quad-Cities and Zion.

The first is scheduled to be in operation this spring. All will be in operation by 1973.

About 40 percent of our vastly greater production of electricity will then be from nuclear stations, which emit no fumes or smoke. Our $600 million nuclear program is the largest of any investor-owned electric power company in the United States.

4. We Are Using Natural Gas and Low-Sulfur Oil, Testing Low-Sulfur Coal, Researching the Removal of Sulfur Oxides
Natural gas is available to us only in limited quantities. We are using all we can get.

We recently announced the 1970 conversion of our Ridgeland Station (in Stickney, Illinois, immediately west of Chicago) to low-sulfur oil-burning equipment. Ridgeland was chosen because its stacks must be lower than those at other stations due to its nearness to Midway Airport.
This conversion alone will eliminate the burning of 1.3 million tons of coal a year.

Another way to reduce air pollution is to use coal with low-sulfur content. There is low-sulfur coal in Montana, Wyoming, and Colorado, and we have been testing it. We haven't yet found any we can burn successfully, because our boilers and precipitators were not designed for it. Eastern low-sulfur coal appears to present even more severe problems. But we continue to test.

Clean-Air Pellets: Each of these tiny nuclear pellets contains as much energy as a ton of coal. They produce electricity without any fumes, smoke or soot.

We have long participated in efforts to develop advanced methods of removing gaseous sulfur oxides from stack gas. Recently we have joined with 15 other electric power companies, Esso Research and Engineering Company and Babcock & Wilcox Company in a $7 million program for the development of an advanced air pollution control system of this kind.

Commonwealth Edison is complying, and will continue to comply in full, with all government laws and regulations on air pollution, including Chicago's Pollution Control Ordinance.

This ordinance, effective in July, 1970, requires that sulfur emissions be lowered in progressive steps through 1974. The ordinance can be complied with either by burning less coal or lower sulfur coal.

We are following the first route, by cutting our coal burn in half, and we will meet the timetable of the ordinance.

This is better than just cutting the sulfur content of the coal because all combustion products are reduced. The ordinance requires approval of our plan to do so, and we have applied for this.

$396 million for 1969 construction
During 1969 construction expenditures were $396 million and plant retirements and adjustments $30 million. Our gross investment in plant and equipment at December 31, was $3.7 billion. In addition, our nuclear fuel investment totaled $71 million.

$1 billion of new securities needed
In the five years 1970–1974, about $1 billion of new securities must be sold to help pay for new construction and nuclear fuel. This is in addition to our January, 1970 bonds and refunding of about $275 million of bonds during the period.

We have announced that we expect to market $100 million of equity securities during 1970, probably towards the end of the year.

Short-term bonds
In the course of 1969, $175 million of first mortgage short-term bonds were sold. In April, $75 million of five-year bonds were issued at an annual cost to the Company of 7.42 percent before expenses. Because of strong demand, the issue was increased from $50 million to $75 million. In July, $100 million of four-year bonds were sold by competitive bidding at an annual cost of 7.73 percent before expenses.

We postponed another $100 million of five-year first mortgage bonds from November, 1969 until early January, 1970 because of what appeared to be an interest rate peak. In the January negotiated sale these bonds had an annual before-expenses cost to Edison of 8.61 percent. Though it cannot be precisely determined, we seem to have saved about half a percent by delaying the issue. If true, this amounts to perhaps $2 million in interest savings over the five-year life of the bonds.

In the '70's, this young man probably will seek his first job. He might eventually become an editor, a skilled craftsman or a computer programmer. Whatever his employment, he and hundreds of thousands like him will need increasing amounts of electricity.

1969 funds statement	(Thousands)
Funds provided by:	
Net income less dividends	$ 33,585
Depreciation and tax deferrals	118,413
Funds provided internally	$151,998
Sales of securities	179,738
Bank loans and commercial paper (net)	86,075
Change in working capital and other items	21,487
Total funds provided	$439,298
Funds applied to:	
Construction expenditures	$396,361
Nuclear fuel expenditures	36,295
Sinking fund debt retirements	6,742
Total funds applied	$439,298

A new bond-buying public
It appears that a new market is developing among smaller investors for these short-term issues. On the two 1969 sales totaling $175 million, about 10 thousand separate holders have been registered with the mortgage trustee. This contrasts with about a third that number registered for $175 million of 30-year, long-term Edison bonds sold during 1968. We are glad to be reaching this mass market of smaller investors.

Other 1969 financing
As we have done in the recent past, we used commercial paper (notes payable) in 1969 to allow ourselves choice in timing debt issues. At December 31, 1969 we had $86 million in commercial paper outstanding.

Commercial paper costs money. Short-term rates have been no cheaper than long-term ones and cut into earnings in the same manner. Our assumption in using short-term bonds, commercial paper and bank loans is that the staggering interest rates now being charged will decline sooner or later, and that we should avoid being locked into long-term obligations at the current high rates.

In the fall of 1969 Edison renewed $60 million in bank loans at the prime rate from Chicago banks, and at December 31 our subsidiary, Mid-Illinois, had $34 million of bank loans outstanding.

During the year we reacquired $11 million principal amount of sinking fund debentures. At year end, our capitalization was 56 percent bonds and debentures, 6 percent convertible preferred stock and 38 percent common stock equity.

12

Food, clothes and exercise are three staples of human life. Electricity helps process coffee cakes at the Kitchens of Sara Lee, show merchandise to its best advantage at Goldblatt's, and light and heat the gym at Hampton Park's all-electric junior high school.

The Midwest's refiner
The Chicago area has struck oil. Northern Illinois within five years may well become the refinery center of the Midwest. Most of the refineries are or will be located southwest of Chicago along the Illinois Waterway. The Union Oil plant at Lemont will use electricity to drive its huge 19 thousand horsepower centrifugal blower. Our salesmen helped to convince Union's management that an electric motor served from our lines is more economic than the steam-driven turbine traditional in oil refineries.

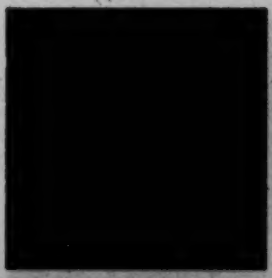
Three other large motors totaling another 20 thousand horsepower also went our way. The new Lemont refinery will be one of the most electrified in the world. It will have a demand of 70 thousand kilowatts and run at 95 percent load factor. Another oil company is now doing site work for a refinery even larger than Union's.

Chemical processors are first cousins to refineries and often locate near them. A number of such plants are in operation or building in our service area. They join a giant, the Northern Petrochemical complex, being developed in three stages over the next several years.

$10 million from giants
Northern Petrochemical and Union Oil, when completed, will contribute close to $10 million to our annual revenues. If fully operative today, these giants would rank third and fourth among our large customers.

Completion of new oil pipelines from Canada and the Gulf Coast to our area coupled with the market advantages of a northern Illinois address have led to this sudden blooming of massive new electrical loads.

An Edison lineman puts his finishing touches on transformers added to serve the expanding power requirements of people. The vitality of our area's commerce and the quality of its goods are shown by pictures of Chicago's Board of Trade and of a gleaming row of electric ranges.



Wages up 6%, benefits higher
As a result of union agreements signed last spring, hourly wage rates increased an average of 6.2 percent. Pensions, insurance and other fringe benefits added the equivalent of another 0.4 percent to payroll. These increases amount to about $12 million on an annual basis. Wages have been renegotiated each year. Fringe benefits, however, had not been negotiated for five years, and the increase in benefits should be looked at in this light.

At December 31, 1969 we had just under 14 thousand employes, an increase of 167 over the same date a year earlier.

181 thousand stockholders
At year end, we had 181 thousand stockholders, down about 2 thousand from a year ago. The slight decrease probably is due to expansion by institutions of their holdings of Edison stock. There were 169 thousand holders of 42 million common shares. In addition, 12 thousand stockholders owned over 4 million shares of our convertible preferred stock.

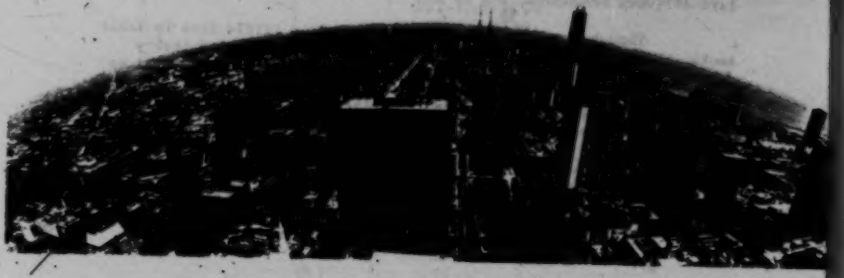
About 120 thousand shares of common were acquired by employes during 1969 under the stock purchase plan, and 43 percent of Edison's employes were in the plan at December 31.

Board and management changes
At the 1969 Annual Meeting last May, Joseph S. Wright was elected a Director of Commonwealth Edison. Mr. Wright is Chairman of the Board of Zenith Radio Corporation. At year end, John L. Gordon, Chairman of the Board of the Central Illinois Electric and Gas Co. Division, retired from active service.

During the year, Wallace B. Behnke, Jr. was elected a Vice-President, Byron Lee, Jr. was named Assistant to the President, George P. Rifakes, was appointed Manager of Fuel, and Charles G. Harnach was promoted to Division Vice-President of our Southern Division.

14

The future of our whole metropolitan world depends upon children such as this. It is Commonwealth Edison's role to furnish clean, reliable, plentiful and economic electric power to him and to eight million others in the '70's.



4428

91

Commonwealth Edison Company

72 WEST ADAMS STREET • CHICAGO, ILLINOIS 60690

January 17, 1969

Dear Security Analyst or Fund Manager:

Each new technology has ushered up its own skeptical and detracting opposition.

The Wright brothers succeeded despite those who pointed out Icarus' fatal plunge to prominence. Battleship admirals scoffed at air power until the Repulse and Prince of Wales went down. Dutch workers tried throwing their shoes - sabots - into newly invented weaving looms and thus were responsible for coining the word sabotage. And one even can imagine manuscript illuminators writing letters of complaint to Gutenberg.

Similar opposition may be gathering against nuclear power, with tales of spiraling capital costs, uranium shortages, atomic bombs, late-delivery brownouts, and so on.

Though the critics are wrong, there's a little fire in their smoke. Take Commonwealth Edison. We have reactor vessel delivery delays. Though no technical problems are involved, Dresden 2 will be eight months late and the two nuclear units following it probably will be several months behind schedule. Despite this, consider the handsome payoff ahead from nuclear power for Commonwealth Edison.

- We have over 5000 Mw of nuclear capacity in six units under construction. We got our four 809 Mw units at an average of $118 a kilowatt. Turnkey contracts, no escalation. Our other two units will cost a third to a half more, depending on how future construction costs go.

- We've contracted for 10 years worth of fuel fabrication at good prices for our six reactors. We've bought all the yellow cake we'll need through 1975, much of it at below $6 a pound.

- By 1974, about half our kilowatthours will be coming from nuclear machines at fuel costs below two mills, including all carrying charges on the fuel inventories. Present system fuel costs average 2.7 mills, and we figure our newest coal-fired units at 2.2 mills.

We could go on and on. Air pollution? We beat the rush two years ago when we volunteered to the City of Chicago to cut SO_2 emissions in half within a few years -- mainly because of nuclear power. Future cost protection? Coal, with a whopping recent eight percent wage settlement, is not going any place but up. But nuclear fuel is mostly a manufactured product, and stands a good chance of price reduction through technological improvement.

We hope you'll understand why we're glad to be the leading nuclear company.

Though medical opinion differs, our experience is that the flu already has passed its peak in Chicago. Why not dodge it and pay us a visit? If you can't make it, give us a call if we can be helpful.

Sincerely,

Preston Kavanagh

Preston Kavanagh
Assistant Secretary

312-RA6-1200
Ext. 2122

DEC

Commonwealth Edison Company
ONE FIRST NATIONAL PLAZA ★ CHICAGO, ILLINOIS
Address Reply to:
POST OFFICE BOX 767 ★ CHICAGO, ILLINOIS 60690

92

December 4, 1969

Dear Security Analyst or Fund Director:

Electric power plants these days are being billed as the worst things since the Krakatoa eruption or Vesuvius' burial of Pompeii. Until a few months ago, Commonwealth Edison had been spared the partly-informed public clamor about pollution which has marked so much of the country. Now, however, things are heating up a bit and we thought you'd like to know our situation.

In summary, we have an early start, some fixing up ahead, and a future program -- thanks mainly to nuclear power -- ranking with the country's best. In detail:

* We're responsible for something over 10% of high level and considerably less of ground level pollution in metropolitan Chicago. Our emissions are mainly sulfur dioxide gas.

* Three years ago we submitted a program to cut coal burn in our six Chicago-area stations in half by 1975. Mayor Daley praised the program as "the first of its kind in the nation" and "an example of what local industry can do".

* A Chicago ordinance effective next July requires that the sulfur content of coal be lowered in progressive steps through 1974. The ordinance allows us to fulfill its objectives by burning less rather than lower sulfur coal. We'll meet that timetable and have applied for the appropriate approval.

* By mid-1973 nuclear plants will be turning out 40% of our kilowatthours.

* Ten years ago we had 58 coal-fired boilers at city stations; today it's 12. We're replacing old peakers with gas turbines, and burning all the gas we can get in the remaining base-load boilers.

* We'll spend $25 million between now and early 1973 for improved or brand new dust collecting precipitators, bag filters, and the like at 11 stations.

* In all, we've earmarked $70 million of our five-year capital budget for pollution control facilities.

* We see no problem in radioactive emissions from nuclear plants. The AEC's standards are stringent, and we shall continue to be well below them. For example, the Jet Set New York analyst making just one round-trip flight to the coast gets more radioactivity than the very closest neighbor of a nuclear plant.

* We're not in hot water on thermal pollution. Lake Michigan is huge and cold, and our lake stations have done and will do it absolutely no damage. For our big new river units man-made cooling lakes are generally necessary.

* We've run ads, developed a squad of personable experts, been on TV and radio, and accepted every speaking date we can arrange to tell our clean air and water story.

* Our billion dollar investment in nuclear (5,200,000 Kw), minemouth (1,200,000 Kw), and gas turbine (1,600,000 Kw) generation is good power system economics. It also advances our clean air cause. These are golden words.

* The Illinois Attorney General intervened in our rate case on the pollution issue. Now the Governor has requested Commerce Commission hearings for <u>all</u> electric and gas utilities to see how the problem can be overcome. This will provide a fairminded and orderly forum to get the facts before our public, and could remove that issue from our rate hearings.

We've been directed (like Isaiah) to write so those who run may read, and thus we blush at three instead of two pages. Explaining pollution, however, is a complex thing and so is doing our full share to throttle it. We hope you'll agree Commonwealth is ahead of its times. And that we are determined -- insofar as we can accomplish it -- that northern Illinois shall have pure water and clean air.

Sincerely,

Preston Kavanagh

Preston Kavanagh
Assistant Secretary
312/294-3173

DEFENDANT'S EXHIBIT 93

NUCLEONICS WEEK — April 4, 1968

COMMONWEALTH EDISON: PROFILE OF NO. 1

BOOTSTRAPPING ITS WAY TO NUCLEAR KNOW-HOW

(First of a series)

Commonwealth Edison takes very matter-of-factly its huge commitment to nuclear energy, the largest of any non-nationalized utility in the world. Some smaller companies may look with awe upon the atom and wonder about its role for them, and the risks lurking therein. Edison views it as just another in the series of technological breakthroughs that have marked the growth of the utility industry—a breakthrough of which the company was ready to take advantage. But let them tell it, as they did in an interview with Nucleonics Week editor Roger Newburger. The Edison cast: J. Harris Ward, chairman and chief executive officer, who alternately joined in at the conference table and sprang up to point to a map or chart on the wall; Gordon R. Corey, chairman of the Finance Committee, and Wallace B. Behnke, Jr., assistant to the president. Most of what follows is in their own words, although edited and reassembled for reasons of space and continuity. For this reason, and because the dialogue was intended to give a picture of the whole company, no attempt is made to identify the speaker of each phrase.

When we made the decision to go nuclear with Dresden-1, back in 1955 (they said), it was mostly due to Willis Gale's farsightedness. He was our chairman then. He felt that this was the most exciting possibility for the next technological breakthrough in the electric-production end of the utility business, and it has turned out to be just that, so far. Nuclear energy offered the solution to several basic problems that we could see on the horizon. Back in the early 1950s, we could see that the logistics of fueling the coal-fired generating capacity needed by 1980 or 1990 would be a problem. We also could see

back then that air pollution, particularly in our metropolitan areas, would be a problem. To us, it appeared that nuclear power might answer such basic, long-term questions. This was well before anyone had a handle on the economics.

In 1951, we were selected by the AEC as one of the four original study teams to explore the possibilities of using the atom for power generation. Our young engineers, along with those of other companies in our research group, worked on it, designed a lot of reactors, worked closely with AEC, fumbled through all those early days while we were learning and getting ourselves tuned up and educated as to what it was all about.

OPTIONS IN CONSTRUCTION MANAGEMENT

Says Commonwealth Edison: Since Westinghouse and General Electric quit the turnkey business, we have found some advantages in having a little more control over construction schedules. But we weren't especially eager for them to get out of it, for turnkey provided another option to us in seeking every possible way of buying the lowest-cost and best unit. . . We're not at all afraid of handling the construction chores ourselves. One key there is knowledge of local labor and we think we have more know-how in this area than GE and Westinghouse—although they have a lot more know-how now than they used to have.

AEC people are sophisticated, conscientious, capable regulators, Commonwealth Edison feels. These are the company's views: They don't do all the things we'd like to have them do, but on some things they listen to us. . . Rather than getting more difficult, it is becoming somewhat easier because we are understanding each other better. These are difficult times for both the regulated and the regulators because of the rapidly changing technology, but we're growing up together in this business. AEC works very

hard at it and we do, too. . . This matter of questions by the ACRS and AEC regulatory staff on the preliminary safety analysis is very time consuming and is one of the big problems power companies have. We try to keep in touch with the letters and questions to other companies through our contacts in the industry and with manufacturers. As time passes, we hope we will be able to solve our joint problems faster and more effectively than we have to date.

Everyone knows when the plutonium glut is going to hit, and it's obvious that this fuel will have to be recycled in water reactors, says Commonwealth Edison. But it also thinks: There is no need to develop for use in 1975 the super-plutonium fuel of 1985. . . The nation can't afford the luxury of redundant research. . . We need some patience and a fairly conservative first-round development effort to get this into the competitive fuel economy. It is important that the independent fuel suppliers have a position here at the earliest practical date but too soon will be too expensive. . . Certainly, they would like to have the utilities pay for all the research and a large portion of the fabrication facilities but we have to worry about cost to the consumer, too. . . Plutonium fuel is not a new subject; only its commercial application is. We must find out what has to be done and who will do it, then get it off to an early competitive start and let the perfect plutonium fuel be developed with the passage of time.

Over and over again, we emphasized to our managers and engineers and accountants our belief in the cost-price-sales-earnings spiral: reductions in costs keep the price of electricity going down; this leads to increased sales, which make it possible to take advantage of economies of scale; this, in turn, brings additional cost reductions and rate reductions and increased earnings. Now, we don't say that we're seers, but because of this

philosophy we're anxious to take advantage of every new wrinkle that comes along.

When it came to Dresden-2, we saw the advantages from an air-pollution standpoint, but we were particularly pleased—and just at first a little surprised—when we saw nuclear prices coming into the ball park where they could beat even our new fossil-fuel plants supplied by unit trains. Just one year before we ordered Dresden-2, in February of '65, we had put into operation the largest unit train in the world, and it was going to cut the price of bringing coal from southern Illinois to Chicago from $2.56/ton to $1.30/ton. We thought this was a terrific breakthrough for coal, but then we saw Dresden-2 coming in still cheaper. Once we had made the decision to go nuclear there, Dresden-3 and Quad Cities and the Zion units followed along naturally. Then we saw more and more the potential advantages in the air-pollution field and the possibility, as metropolitan siting becomes acceptable, of getting our stations closer to load centers, thus helping alleviate—both in cost and appearance—the problem of cross-country transmission lines.

(In 1973), when Zion-2 is scheduled to begin operating, about 50% of Edison's output will be nuclear-generated. Is the company worried about such a vast commitment to the new technology, with plants of an untested size?)

We think the possibility of nuclear power stations not working is almost non-existent. The technology is well proven. Certainly we have worries about getting them built on time and keeping them running, but we have these with every plant. For instance, when our Ridgeland-1 was built it introduced a certain kind of stainless-steel piping which was a great advance back in 1951. Soon after it went into operation, cracks developed in the stainless steel. We had to tear out sections of it and had all kinds of examinations made of the piping. We never have gone back to stainless of that particular kind. For another thing, apparently nobody yet knows how to build a boiler tube, they're always springing leaks, and boiler availability is our biggest problem with our modern coal-

fired units. These boilers are 22 stories high, and when you develop a pin-hole leak in one you shut the whole thing down and, after an eight-hour cool-off, you send up a man in an asbestos suit in a bo'sun's chair to fix it. It's a perpetual problem. Maybe there's a little more risk with nuclear hardware, but we've been making and using turbines and condensate pumps and fans for years and they're certainly not new parts. Even though we haven't been making reactors for years, we did start studying them in 1951. Four years later, we ordered Dresden-1 for service in 1960. Then we played with Dresden-1 for almost five years before ordering Dresden-2. So you see, the idea of a reactor is not very new.

Then, as you get into the 1970s, you'll see an increase in regional interconnections between large power systems and a decrease in the number of weak spots in these systems. And you'll know where the weak spots are, the difficulties with them. Sometimes you'll have to build a line and sometimes you'll have to persuade the other man to build a line. Now, when we put a nuclear station out there at Quad Cities, we establish a joint-ownership relationship with the utility to the west and we are all part of the 345-kv loop around the Middle West. If we have trouble with the plant, various interconnected companies will make up the lost capacity. So, as you increase in strength and interconnections, the vulnerability of any single system to the loss of an individual plant becomes a matter of less concern.

These 1,000-Mwe plants are not so strange, anyway. They're a little bigger, but not very much bigger even in terms of physical dimensions. Go back to Dresden-1 and its 200 Mwe. What was the Vallocitos Boiling Water Reactor? 5 Mwe? There was an extrapolation of about 20 to 1, and we made it all right. This has been true all the way through the power business. Not so long ago, we were building 150-Mwe fossil units, then moved to 300s, then 600s. It's a matter of degree. And General Electric and Westinghouse are competent designers and manufacturers, and they have a lot riding on these machines, too.

NEXT WEEK: Limitations on mine-mouth plants; future siting; thermal effects.

NUCLEONICS WEEK—April 11, 1963

COMMONWEALTH EDISON: PROFILE OF NO. 1

NUCLEAR COSTS ARE RISING, BUT THERE'S NO CEILING ON COAL, EITHER

(Second of a series)

Like other utilities, Commonwealth Edison maintains a running comparison of nuclear and fossil-fueled power-production costs. In recent years, Edison's comparisons have led to the Dresden, Quad Cities and Zion nuclear units. Despite recent sharp price rises for nuclear-plant components, the company sees little coal in its future. Three executives tell why in an interview with NUCLEONICS WEEK *.

Sometimes (they said) we have to remind people that Dresden-1 was ordered in 1955 and went into service in '60; it's been running a little over seven years but the first full equilibrium core loading of fuel won't be burned up until sometime in the early '70s. We have our estimates, of course, but there are a lot of imponderables in trying to compare costs, particularly when it comes to estimates of future escalation. We think the construction costs of nuclear plants are going to be affected by escalation of construction labor and things like that; Zion won't go into service until 1972 and '73 and we won't know until it gets built how much that escalation has amounted to. In addition, future fuel costs are an equally important factor because they will total more than the plant cost over the life of the unit. But, despite escalating

[Pictures]

* The three executives are J. Harris Ward, Commonwealth Edison chairman; Gordon R. Corey, chairman of the Finance Committee, and Wallace B. Behnke Jr., assistant to the president. They discussed the company's philosophy and management techniques with NUCLEONICS WEEK assistant editor Roger Newburger. This second of a three-part series again is mostly in their own words and, so as not to interrupt the flow, identification of the specific speaker is omitted.

plant costs, we feel that escalation of coal costs over the life of a competing coal-fired plant would be at least as great as it will be for nuclear fuel. That could be 35 years—say 1973-2008—and who can say what the price of mining coal in Illinois is going to be in the year 2008?

You cannot buy coal now for such a plant without buying it on virtually a cost-plus basis. Our policy is to buy it on 5-10 year contracts. Coal is not a great big capital investment business; about all you do when you buy it is pay what it costs a man to get it out of the ground. We believe we can do better buying it, not from year to year, but in 5- or 10-year intervals. That way, we can buy from the most efficient miners—the ones who have the best people and are doing the best job at any given time. If we were to pick out one company and say; "We are going to give you a long contract," obviously he'll retort, "Well, I'll give you the best price I can, but I have to have escalation," and then you end up with cost-plus.

Partly as a result of air pollution, partly because of urban congestion, there has been a trend to mine-mouth generating stations. We put one in, too—the first unit went into service last May. A few years ago, we couldn't have done this, but then 345-kv technology came along. We needed additional tie lines to the south for the expanding interconnections and we had to put at least one of those lines through the mine area anyway. When we gave the mine-mouth the benefit of this transmission in figuring costs we were able to prove it in economically, so we thought we might as well use the line as an equivalent to shipping coal from central Illinois to Chicago. Probably similar situations have brought about the mine-mouth plants in the East. The expanding transmission grid made lines available anyway and you didn't have to figure that as part of the station cost.

But once you get a mine-mouth plant, you absolutely have to contract for coal to supply it. The capital cost on the plant is $120-million, but the capital cost on the mine is about $10-million. Obviously, you can't be put in a position where the $10-million investor can hold you up because you have your big $120-million plant

sitting beside his mine; so, for all practical purposes, you have to buy the mine. That is the situation with out mine-mouth plant: we made a long-term cost-plus contract for the coal, it runs to 1982 with three 10-year renewal options that will take up to the year 2012. The need to protect your investment in a mine-mouth plant may give a false impression that longer-term coal contracts result from the competition with nuclear fuel.

Of course, on any coal-fired plant we are concerned about air-pollution, just as we are concerned about thermal effects on cooling water of both our nuclear and fossil plants. Neither of these ideas is exactly new around here; we've been thinking about them for some time, and we try to plan to avoid problems. We're fortunate in the availability of water in our 11,000-square-mile service area and we try to be foresighted about our use of that water.

We're not yet hurting for sites for future plants: we have several more river locations available and Lake Michigan provides a vast amount of water. In theory, if it weren't for transmission problems, we could expand lake-front stations, such as Zion, indefinitely, subject of course to environmental effects. But the metropolitan area is so built up, especially with heavy industry, that we can't put through too many transmission lines. While we can take a million kw on our line from the East—maybe even a little bit more—we're limited by the risk that one airplane or one tornado conceivably could knock out both these circuits. When you have a big generating station you like to have at least two ways of moving the electricity, and you prefer to move it at pretty high voltages. That's very hard to do through the center of a town because of the electrical losses inherent in going underground with a 345-kv line. The cost is prohibitive, too.

ON FUEL DIGGING AND DESIGNING

Commonwealth Edison says: We have been thinking for six or seven years of the possibility of getting into uranium exploration. We probably shouldn't be in it unless others are not

doing the job right. . . We had feared some shortage of uranium in the early 1970s but the situation seems to have eased. We have committed for over $100 million worth of yellowcake at good prices and we're not nervous about our supplies. . . We're not interested in leasing fuel. We can get money as cheaply as anyone else and we're inclined to do our own financing. . . We lean in the direction of providing our own fuel design; we want to understand the fuel world completely. Also, we fully expect to manage our own nuclear fuel while it's in the reactor, rather than what we do now, on the services of the fuel suppliers.

There are advantages to everyone in having plants reasonably close to load centers but we're not pushing this too hard. Dresden is not too far from Joliet, but that's not the same as being near the Oranges or Newark, in New Jersey; it's a relatively isolated spot. The plant was quite well received, too. After all; Chicago was the birthplace of nuclear power, and Argonne National Lab, where the boiling water reactor was conceived, is not far from Joliet. It was only logical that our first nuclear plant should be built nearby. Moreover, with the property taxes that we pay on Dresden, the community was able to fix up its schools and make other needed improvements. The people were genuinely happy to welcome Dresden station.

When time came for another station the people of Zion were inclined to take it for granted that it would be located there on land we had owned for over 10 years. When word leaked out that we were considering a demonstrate site near Seneca, Zion got pretty upset, thinking about all that tax money with which it could build schools and parks and other things a community likes to have. And the people in Seneca began to think about it, too: that maybe it would be a lot better than having a fossil-fuel plant or an industry throwing out a lot of smoke. They wound up with a spirit of competition, all on the positive side. No one in this area

has picked up any of the negative feeling that existed elsewhere in the country. There are some conservationists here concerned right now with preservation of the natural prairie that we have in Illinois, but there is no conflict with Dresden and we believe our relationship with them is friendly.

There's been a lot of talk about building an airport for Chicago about five miles out on Lake Michigan and, if they ever did it, perhaps it might make a good deal of sense for us to have a generating plant there, too. But this is still pretty much in the realm of conjecture. We have no problem of overheating lake water, since we will be well within the temperature limits, and even on the inland streams we haven't had to go to cooling towers for any of our plants. We've tried to plan very carefully to build them far enough apart to give river water adequate time to cool between plants so we can stay within the regulations. We still have a number of potential sites and room for added capacity at existing stations. We may have to go to cooling towers some day, but not yet.

We think, also, that technology is helping, not hurting us. We're building 1,000-Mwe nuclear stations that will heat the water to a certain temperature. Hopefully, 30 years from now, they will be replaced by 2,000-Mwe stations that won't heat the water any more than the 1,000-Mwe stations did. This happened in the coal side of the business and it's bound to happen in the nuclear side, too. We moved to higher and higher steam temperatures in the coal-fired boilers and yet maintained the same temperature in the condenser. Right now, the low cost of nuclear fuel doesn't lend itself economically to the use of plants with high steam temperatures and pressures and correspondingly more efficient turbines. Steam superheat, for instance, just disappeared because, economically, it didn't have a place. But we're speculating that this may no longer be true with the advanced breeder technology that we'll have in the 1980s.

NEXT WEEK: It's no business for midgets; joint ventures; personnel development.

NUCLEONICS WEEK — April 18, 1968

COMMONWEALTH EDISON: PROFILE OF NO. 1

NUCLEAR POWER IS NOT A SMALL-COMPANY BUSINESS

(Third of a series)

Commonwealth Edison is a giant and it minces no words in stating its feeling that this benefits the public. The power-generation business is not meant for midgets, said three executives in an interview with NUCLEONICS WEEK *.

Edison is now the single descendant of well over 200 power companies, but back in 1938 the various consolidations to that time had resulted in five separate companies (the three executives explained). It was about that time that the five began to be operated as a single system, thus permitting better over-all planning. When an area is covered by many small companies you'll have one company planning to put a plant here, another company thinking of a new unit there, with resultant lack of cohesion. In New England, for instance, the companies have gotten together now but, although they were thinking 15-20 years ago about this kind of over-all planning, the will to achieve it had to overcome normal inertia and this cost them a great deal of time. Some might think this kind of talk sounds monopolistic, but we think it's for the good of the public.

What happens to the little companies in this day of big nuclear plants? We're not sure that there is a single

[Pictures]

---

* The three executives are J. Harris Ward, Commonwealth Edison chairman; Gordon R. Corey, chairman of the Finance Committee, and Wallace B. Behnke Jr., assistant to the president. They discussed the company's philosophy and management techniques with NUCLEONICS WEEK assistant editor Roger Newburger. This last of a three-part series again is mostly in their own words and, so as not to interrupt the flow, identification of the specific speaker is omitted.

solution for every situation. We had such a problem in our territory a little over a year ago. Rockford, the second largest city in Illinois, was virtually surrounded by our system—an island in our service area served by Central Illinois Electric & Gas—and that company opened discussions with us on power supply and nuclear units. We both recognized the solution, and a merger that would best serve the interest of both companies' customers and stockholders was relatively easily accomplished.

There are other situations and other solutions. In our territory, there are seven municipalities with their own power distribution departments. Two generate their own electricity. We supply the others at wholesale rates which are under the jurisdiction of the Illinois Commerce Commission and the Federal Power Commission. We think the regulatory commissions are perfectly capable of looking after the well-being of these municipalities. After all, each of these towns that we serve is a smaller user of electricity than some of our large industrial customers; no one hears any of the industrial customers asking for a share of one of our nuclear plants and we seek no justification for a municipality to seek such a share, or a voice in running the plant, either.

The industry may seem to be evolving in a direction which favors one kind of company more than another, but we think it desirable to have utility systems large enough to take advantage of the economies of size made available by today's technology. This means large enough—on the order of 10,000 Mwe—to buy and use a 1,000-Mwe unit. Maybe tomorrow will bring some other technological development which will indicate a different size of system. Two things, though, seem quite clear: little generators are a very expensive luxury, and atomization of the industry, so as to give every little company a chance to own a small piece of a reactor, would create a difficult situation. We can just imagine a nuclear plant with some people having a 1% ownership and a 1% vote and somebody else having a 3% share and a 3% vote, and every time you wanted to buy some yellowcake you'd get all the voters together to see if they could agree on the purchase.

The writing a few years ago of the National Power Survey demonstrated that public and private power people can work together. One of us was involved in that, along with a man from TVA and the FPC staff. We found that philosophically, as far as operations and objectives were concerned, we were not far apart. It seems unfortunate, therefore, to reinject this old question of public power vs. private power into the matter of nuclear plants. TVA is building power stations and distributing power and selling it to municipalities, and their municipal customers aren't saying, "Please give us a piece of Browns Ferry."

Municipal systems should be given the benefits of large-scale economies, but they can have these by becoming customers of the big systems. It is not a small-company business. Perhaps some would say that this is against America's basic philosophy and that anyone should be able to take a crack at anything. But that's like saying anybody can get into the automobile business. It just isn't true. This country has passed the point where you can economically build a car in your barn. Small systems will continue to operate and small plants may occasionally be competitive because of geographic isolation or special tax or governing-financing privileges, but in any wider view construction of small generating units seems wasteful. There are advantages in being small, but bringing uneconomic generating units on line is certainly not one of them.

ON BREEDERS AND CONVERTERS

The r-&-d effort on fast breeders is proceeding at an adequate pace, Commonwealth Edison thinks. It explains: U.S. timing may lag a little behind England's but we have different economic concepts and different objectives. They don't look upon capital costs the way we do and they have an obvious interest in minimizing their dependence upon uranium supplies from the outside world. . . Our breeder studies with General Electric and Westinghouse should bring

us in two years to the point of decision on building a demonstration plant, then about five years more for construction and operation. If the breeder comes in on this schedule, there probably would be no room for the advanced converter, especially if light-water reactors continue to improve. However, we don't rule out the possibility of the converter and we continue to watch all these technologies.

Collective plant ownership is a possibility, but the partners should not be too different in size. When we negotiated the Quad Cities agreement with our neighbor, Iowa-Illinois G&E, it was arranged that we would manage it for the good of both parties. This was a fairly simple approach, but even this partnership can never be quite as efficient as single ownership. For instance, if yellowcake is purchased at various times and prices for both Quad Cities and other Edison plants, what is the price to be charged to Iowa-Illinois? Only goodwill and mutual trust between us have enabled us to solve such problems. Our management of Quad Cities does not relieve us of any legal liability to be fair; in fact, it puts the monkey on our back. But at least there is no committee management, which we believe is ineffective, inefficient and cumbersome.

Our management philosophy is toward decentralization. We are split into seven geographical divisions, each with a vice president who, in effect, is running his own sizable utility company. Some of these divisions have $100-120-million a year volume and 400-500,000 customers. We move people around among divisions, make them profit-conscious, cost-conscious. We show them what other divisions are doing. Since we have adopted this approach, all the divisions have improved in performance. This is what competition does.

Another effect of competition is that it encourages young men to want and accept responsibility. Some of our divisional vice presidents now are under 40 years of age. Our structure lends itself to similar treatment of other personnel. We can and do move bright young

engineers into the nuclear field, bright financial people into nuclear purchasing and nuclear analysis. We're constantly training and developing our people, sending them off to school, to national labs, to Dresden station, to Purdue University for the fuel-management course we've helped sponsor. When we hire we're interested in a man's study discipline, but not exclusively.

When we first got into nuclear matters we started with just a few young electrical and mechanical engineers, a chemist, an accountant. Cliff Zitek was a chemist; we got him into Argonne National Lab for training in the early days. We had Murray Joslin then, and the late Titus LeClair, both electrical engineers, and they set about learning the business. You need only a few highly competent people with specialized disciplines who can help you with some of your thinking and development.

The Dresden station has been our keystone: the young engineers worked along on its development, put it into service and operated it. We have worked hard to put as many people through that station as we could so that today we have a fairly sizable and extremely capable staff with a wealth of experience. A lot of these young men who started at Dresden have gone on to become supervisors and managers in our engineering area. The fellow who buys our nuclear fuel trained at Dresden; so did another man, who then worked in our engineering department, designed for awhile and now is stationed at Westinghouse studying fast-breeder technology. We have another engineer at General Electric in breeder work, and there's one at the National Reactor Testing Station, working on EBR-2. We will bootstrap our way to the fast breeder just as we did in light-water reactors. You don't have to start with a whole platoon of specialists in each discipline. Our people are learning the language and the technology. They may not have their hands on all the subjects yet, but they'll be educated by the time we'll have to decide if we want to build a breeder.

We would like to see universities turning out more nuclear specialists; an education in nuclear engineering is important to power companies. But specialized formal education isn't the whole story. Put a man at the Dresden

station for six years and he soaks up an amazing amount of knowledge. He may not design the first fast breeder, but he'll certainly know how to operate a boiling water reactor. This is technical work of a repetitive nature, and it represents good jobs which don't need to be filled with graduate engineers or physicists. You look back 10 or 20 years and we had engineers doing a lot of things then that technicians do today. The important thing—for both technicians and management people—is to give them the opportunity and incentive for development. We think we offer as much of these as anyone in the business.

* * *

Do saxophones sound better in all-electric schools? We think so. These students at Hampton Park's West View Junior High School seem to like their environment. Education is a fast growing part of the nation's economy, and because of northern Illinois' high income and education levels, new school construction is especially strong in our area. We have taken advantage of this by promoting over three million square feet of all-electric schoolroom space.

and other operations. Of the electric payroll, 72.5 percent was charged to operating expenses.

Depreciation on electric plant in 1968 was $94,020,351, equaling 3.30 percent of depreciable property. This was up slightly from 3.29 percent for 1967. Commonwealth Edison uses one of the highest depreciation rates in the electric power industry. Technological change is rapid, and we take advantage of this by purchasing the most modern machines and equipment. Also, we think it prudent to make adequate provision now for possible future obsolescence.

Taxes Up Over Eight Percent

In 1968 we provided $202,310,655 of local, state and federal taxes for our electric operations. This is equal to $81 for every customer on our lines. This year we provided 8.6 percent more for taxes than in 1967, and state and local taxes once again had the largest portion of the increase. We try to manage the affairs of the Company to maximize operating economies and then to pass these savings along to our customers and stockholders. Rising costs and especially rising tax costs are major offsets to the economies we are able to achieve.

Our electric tax provisions were:

	1968	1967	Percent Increase
State and local taxes	$101,287,392	$ 90,982,961	11.3
Federal income taxes	85,640,000	83,009,000	3.2
Deferred federal income taxes (net)	11,947,108	9,302,000	28.4
Social security and miscellaneous federal taxes	3,436,155	2,957,374	16.2
	$202,310,655	$186,251,335	8.6

Record Summer Load

A record peak load of 8,950,000 kilowatts was set between 1 and 2 p.m. on August 23, a hot, humid Friday afternoon. This is 1,307,000 kilowatts or a remarkable 17-percent higher than 1967's summer peak. While 1968 had normally warm summer temperatures, the prior year was one of the coolest in 50 years. In effect, 1968's peak reflected the heat sensitive load growth of almost two years.

Interconnections

Reliability of our service is enhanced by the Midwest's network of high voltage interconnections. In May, tornadoes destroyed or damaged 84 towers on two different 345,000 volt lines, spaced four miles apart, and leading from our Kincaid Station. Because of our interconnections, there was no interruption of service to our customers.

New Generating Units

In June, a 600,000 kilowatt twin to the unit brought on line in 1967 was placed in service at our Kincaid Station. The two-unit plant in central Illinois is located virtually on top of the country's largest deep coal mine. Instead of bringing coal to the generating plant, the generating plant has been brought to the coal. Though Kincaid Station is far from any urban area, $6,000,000 has been spent at the plant for air pollution control facilities.

During 1968 we ordered a coal-fired unit to be located at our existing Powerton Station near Pekin, Illinois. It will have a capacity of 840,000 kilowatts and is scheduled for completion in the spring of 1972.

We decided on the Powerton addition because of the strong growth of our peak loads and because coal-fired units can be built more rapidly than nuclear units. While

* * *

Farmer John Moran dries corn on a 500 acre all-electric grain farm near Manteno. He estimates his drying expense at under 4¢ a bushel using electrically driven fans and duct heaters, about half the operating cost of his former system. Mr. Moran, chosen in 1967 as Illinois' Outstanding Grain Producer, will use a total of about 130,000 kilowatthours this year. We serve seven million farm acres in a territory containing some of the Midwest's richest soil.

this decision was taken primarily because of accelerating load growth, it also will give us protection against delays in delivery of our nuclear units.

Dresden 1, a 200,000 kilowatt nuclear unit, has been running well since it came on our system in 1960. In addition, we have six more nuclear units under construction.

Dresden 2, the first of the six, is an 809,000 kilowatt nuclear generating unit being built under turnkey contract by the General Electric Company. While the unit should begin producing kilowatthours in the fall of 1969, full commercial operation is not expected until the turn of the year. When we ordered the machine four years ago, we planned to have it ready for the 1969 summer peak.

The delay has been due to start-up problems in a subcontractor's plant built to fabricate reactor vessels. The reactor vessel makes up only about five percent of the total cost of a nuclear unit, but its timely delivery to the construction site is essential to on-schedule completion of the unit. Though the reactor vessel fabrication bottleneck appears on its way to being broken, we still expect delays of several months for the next two nuclear units coming on line after Dresden 2.

Nuclear Savings

Despite these delays, we are glad to be the nation's leading nuclear power company. This leadership has enabled us to assemble and retain an outstanding staff of young nuclear scientists and engineers. Also, because we were early in the field, we were able to buy nuclear fuel and generating units at low prices with limited exposure to escalation.

Four of our six nuclear units on order were purchased on firm price, turnkey contracts for an average of $118 per kilowatt, including all overheads. The two others, at our Zion Station, are expected to cost a third to a half more, depending on future construction costs. In all, these six nuclear units have a total capacity of over 5,000,000 kilowatts at prices which look more and more attractive in the light of today's market.

In addition to providing low cost capacity, our nuclear units will be powered with economical fuel for which contracts already have been signed. We have purchased ten years worth of fuel with a very limited exposure to price escalation. All in all, we estimate that by 1974 our nuclear units will be saving us $10 million a year in capital and operating costs, compared with coal-fired units of the same vintage.

Capacity Growth

On order for 1969 and 1970 delivery are 727,000 kilowatts of fast-start peaking units. These will join the 664,000 kilowatts of similar capacity installed during 1968. These machines have low capital costs—about $90 per kilowatt—but relatively high fuel costs. They can be built quickly and because they require no cooling water, the units can be located near our load centers, thus cutting transmission investment.

We shall depend upon our big nuclear and coal-fired units to meet our base loads, using the peaking units for a relatively small number of hours each year to meet seasonal peaks and unexpected outages in the larger units. Because the turbines are small and can be started quickly, they can be brought on line in small increments as our load rises.

Capacity additions are carefully planned to serve the rapid load growth in our service area. An illustration of the strength of this growth is that five years ago we had 6,762,000 kilowatts of net generating capability. Today that figure is 9,757,000. And five years hence, after new units have been added and older equipment retired, our net generating capability will total about 15,800,000 kilowatts.

* * *

DEFENDANT'S EXHIBIT 95

Edison seeks A-site Downstate

By Harlan Draeger

Commonwealth Edison Co. said Tuesday that it is seeking options on about 7,000 acres of land in La Salle County as a possible site for a nuclear power plant.

The land is located near Seneca, 80 miles southwest of Chicago's Loop and not far from the company's Dresden nuclear plant.

"We have no commitment to build anything out there," an Edison spokesman said. "We do have agents trying to obtain options."

HE SAID present expansion plans are expected to meet generating needs through 1975.

"We will need additional capacity in 1976," the spokesman said, "but where or what it will be has not been determined. It is a possibility that there could be a plant in this general vicinity."

The spokesman said that, if a plant is built near Seneca, it is likely to be a nuclear generating station. "We're fairly well committed to a nuclear future," he said.

FIRST REPORTS that Edison was trying to line up land options near Seneca came from real estate agents in La Salle County.

Edison officials said that any big new plant would require water cooling facilities, probably a pond.

COMMONWEALTH Edison opened its Dresden nuclear power station near Morris in 1960. The second Dresden unit now is being tested for a start-up this spring. A third unit will go into operation next year.

Two nuclear units also are being opened at Zion and in the Quad Cities area.

By 1973, the company expects to be generating about 40 per cent of its power with nuclear facilities.

Chicago Daily News
3/19/70

Nuclear power for Chicago: our first unit works so well we're building you five more.

DEFENDANT'S EXHIBIT 96

Dresden One was our pioneer. Sure, it helped make a brighter Chicago. More important, it showed that nuclear-powered generating units are more efficient and reliable. And, by using nuclear energy we could produce electricity at about ten percent less cost.

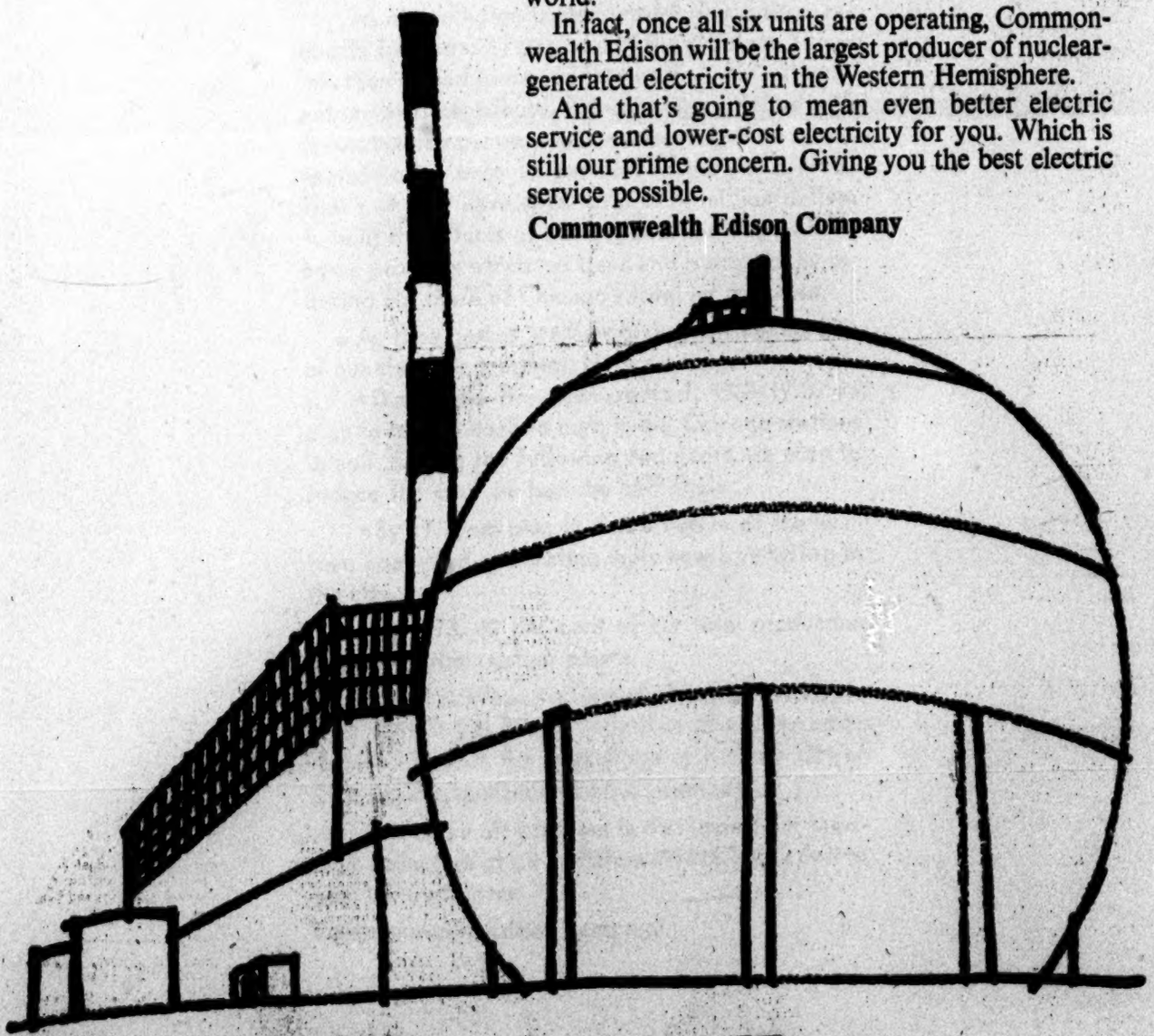
Result?

By the early 1970s we plan to add five more nuclear units. Each to be one of the largest in the world.

In fact, once all six units are operating, Commonwealth Edison will be the largest producer of nuclear-generated electricity in the Western Hemisphere.

And that's going to mean even better electric service and lower-cost electricity for you. Which is still our prime concern. Giving you the best electric service possible.

Commonwealth Edison Company



The bright new ideas are Electric.

CHICAGO DAILY NEWS, Monday, March 13, 1967

First Report

DEFENDANT'S EXHIBIT 97

Commonwealth Edison Reports on Chicago's Air Pollution Problem

We share the concern of all Chicagoans for clean air. Edison's future depends on Chicago, just as Chicago depends on Edison for electricity.

As air pollution is measured today, Edison accounts for under 11 per cent of the problem. This is less than it used to be and far less than, for instance, automobiles contribute. But we're not satisfied with favorable comparisons and we don't want to be responsible for even 11 per cent of the pollution. That's why we have spent over fifty million dollars to limit the effects of burning coal and why we have had a program which has been and is drastically reducing our share of Chicago's total air pollution.

As time passes, we'll be giving you the features of our clean air program. Here's a start:

- During the five-year period, 1968-1973, we plan to cut the coal we burn in our Chicago stations in half. During the following two years, we plan to reduce the coal we burn by half again.
- By 1973, we plan to retire twelve of the nineteen coal-fired generating units now operating in the city.
- By 1973, 40 per cent of our total production will come from nuclear plants.
- We'll continue to be well ahead of the objectives established for the reduction of sulfur emissions set forth in the original schedule of the City of Chicago's air pollution control ordinance.

Our clean air program is designed for maximum reduction of air pollution at reasonable cost to you, our customers.

Commonwealth Edison Company

CHICAGO SUN-TIMES, Fri., July 11, 1969

CE&C

606

DEFENDANT'S EXHIBIT 98

Commonwealth Edison Reports on Progress Toward Cleaner Air

In January 1967, Commonwealth Edison Company submitted a report to the City of Chicago outlining plans for an accelerated program of air pollution reduction consistent with maintaining power reliability throughout the Chicago area. We promised to do our share to clean up the air while continuing to meet our important responsibility of providing power whenever and wherever it's needed throughout our 13,000-square-mile service area. Here's how we're living up to our responsibilities:

We're burning less coal

The fastest way we can cut down our share of Chicago's air pollution is to burn less coal. We're following this plan and meeting our targets ahead of schedule. In 1968 we cut the coal-burn at our four Chicago stations by nearly 15 percent. By 1973 we'll be burning 50 percent less coal in Chicago than we did in 1967. This means there will be half the smoke coming out of our stacks—half the sulfur dioxide, half of all emissions. And by 1975, we'll cut our coal-burn in half again.

More furnace retirements

Since 1956, we have retired 14 coal-fired units from our four Chicago plants. Twelve more units will be retired in the near future. By the end of 1971 only seven will be in operation. The coal-burning units are being replaced by fast-start peaking units that use gas or low sulfur oil, by extra-high-voltage power lines that bring power into Chicago from distant generating stations, and by clean nuclear energy.

Use of natural gas increased

Our generating stations are using natural gas in greater quantities. This year, gas burned at our plants in and near the city will replace nearly 1,700,000 tons of coal. A great deal of this gas, along with low sulfur oil, is fueling the fast start-up generators we've installed in our plants during the past two years. It cost $110 million to install these units. They will help solve the air pollution problem, while improving the dependability of our power supply.

More nuclear power

Clean, combustion-free production of electricity is a specialty of nuclear power plants. Dresden, our first nuclear station, has produced over 8¼ billion kilowatt-hours of electricity for our customers since it went into operation in 1960. Now we're spending $900 million for six additional nuclear units and fuel to raise our nuclear capacity above 5 million kilowatts by the end of 1973. In that year, nuclear generation will account for 40 percent of the electricity required by our customers.

These are the main points of our clean air program. In the near future, we'll be telling you about additional aspects. We hope you'll agree that we are doing our share to give Chicago clean air.

Commonwealth Edison Company

© C. E. Co.

DEFENDANT'S EXHIBIT 99

A Public Service Memorandum from Commonwealth Edison

No smoke. No dirt. No fumes.

Dresden Number One
The world's first privately-financed commercial plant for nuclear production of electricity. It is located on a 950-acre site near Morris, Illinois, where the Des Plaines and Kankakee Rivers join to form the Illinois River. Dresden was owned by Commonwealth Edison in June, 1959, and has operated successfully ever since.

In the foreground and underneath, the channels for a new nuclear power station, Dresden Number Two, which will open this Spring.

How Commonwealth Edison pioneered the production of electricity from a vast new source of energy which does not pollute the air you breathe

It all began on an abandoned squash court under the stands of Stagg Field at the University of Chicago.

There, on December 2, 1942, a team of scientists under the direction of Dr. Enrico Fermi achieved the first nuclear chain reaction. It was the power of the universe brought under man's control.

A new age began that day. Mankind had discovered how to use a new source of energy, with limits not yet known, to augment the non-renewable supplies of coal, oil, and natural gas buried in the earth millions of years ago and being used up at an enormously increasing rate.

For nuclear power comes from the heart of the atom. It can be made into useful energy anywhere that a nuclear reactor can be built and operated. Unlike the burning of coal, oil, and gas, nuclear reactions produce no smoke, no dirt, no fumes to pollute the air.

Shut the Pottery Plant, at Dresden

Clean, silent nuclear energy can be transformed into clean, silent electricity, at costs which permit its use in most parts of the United States today; eventually, everywhere.

The first electric generating plant was that of Thomas A. Edison. In 1882 this plant, located in New York City and powered by a coal-fired steam engine, began generating electricity for 800 incandescent light bulbs in the factories, offices, and homes of a few customers.

From that time on, as new uses for electricity were found and the demand for it increased, power had been supplied by the burning of coal, oil, or gas, or by water power.

Although Dr. Fermi may not have thought of his achievement in those terms, it was as though thousands of Niagaras, Hoover Dams, and Grand Coulees suddenly had been put down on the face of the earth.

Again it was in the Chicago area that the commercial use of privately-financed nuclear energy first became a reality: at Commonwealth Edison's 200,000-kilowatt Dresden Nuclear Power Station, 50 miles southwest of Chicago.

It was designed and constructed under the close supervision of the Atomic Energy Commission which, on May 4, 1956, issued a construction permit.

Dresden went on full power June 29, 1960.

Since then, 13 other nuclear plants have been put into operation by other electrical companies in this country. But Commonwealth Edison, the pioneer, remains the leader. Our nuclear program is the largest of any private utility in the United States, both in terms of dollars invested and kilowatts of capacity.

From the time a company decides to build a nuclear plant until the plant begins to produce electricity, at least five years pass. That's if all the contractors meet their delivery dates. It's safer to plan on seven years.

Pollution-Preventing Pellets

Inside the nuclear reactor at Dresden are fuel rods filled with pellets of nuclear fuel—one ounce each pellet is the energy equivalent to a ton of coal that can't burn to ashes, dirt, or fumes.

We now have six new, large, nuclear generating stations under construction.

Dresden Number Two will be in operation this Spring.

Dresden Number Three is scheduled to go on line next Winter.

Each of these new Dresden units has more than four times the capacity of Dresden Number One.

Yet this is only one long stride in our nuclear program.

Four more nuclear units are being built.

Quad-Cities, on the Mississippi River near Rock Island, Illinois, will have two units like the new ones at Dresden. The first is scheduled to open in 1971, the second in 1972.

At Zion, Illinois, on Lake Michigan a few miles south of the Wisconsin state line, our sixth and seventh nuclear units are under construction. One will open in 1972, the other in 1973.

Well within the next four years, our total capacity of the nuclear stations will be 5,200,000 kilowatts, 26 times what it is today. That is far more electricity than the entire city of Chicago now uses.

By that time, Commonwealth Edison will have spent nearly one billion dollars to develop nuclear power, to keep pace with your growing demand for electricity without emitting the slightest trace of smoke, sulfur dioxide, or dust.

We have spent and are spending millions more for the most modern dust-collecting precipitators, for gas turbines, and for the conversion of coal-burning units to other fuels.

Commonwealth Edison's total activities to reduce and prevent air pollution add up to the greatest single effort to clear the air which we know of today.

Commonwealth Edison Company

A Public Service Memorandum from Commonwealth Edison

You're looking at 20,000 tons of smokeless, fumeless "coal."

This is a picture of a nuclear fuel "bundle."

It's 14 feet long, 5½ inches square.

It holds 49 fuel rods, each made up of pellets of nuclear fuel so small (and so safe) you could hold a dozen or more in your hand.

It will produce as much electricity as 20,000 tons of coal, without putting the slightest trace of smoke or sulfur dioxide into the air.

In a month or so, it will be making power for you at Commonwealth Edison's new nuclear power unit, Dresden Number Two, 50 miles southwest of Chicago.

Since June, 1960, we have operated the world's first privately-financed nuclear power station, Dresden Number One, designed and constructed under the close supervision of the Atomic Energy Commission.

Scientists from the U.S. Public Health Service recently made a complete review of Dresden One and its effect on its surroundings. They checked air, rain, snow, soil, corn, grass, milk, cattle, fish, and river water. They found no harmful effects, after ten years of operation.

Commonwealth Edison has the largest program of any electric company in the nation for the production of nuclear power.

Inside this "containment vessel" is the nuclear reactor for Commonwealth Edison's third smoke-free, fume-free power station: Dresden Number Three, scheduled to go on line next winter. The protruding pipes will carry steam to and from the vessel's interior, as in the first two Dresden nuclear power plants now in operation. Edison's nuclear stations will clean, air and water

We have five more new, large, nuclear generating units under construction.

Dresden Number Three is scheduled to go on line next winter.

Quad-Cities, on the Mississippi River near Cordova, Illinois, will have two units. The first is scheduled to open in 1971, the second in 1972.

At Zion, Illinois, on Lake Michigan a few miles south of the Wisconsin state line, our sixth and seventh nuclear units are being built. One will open in 1972, the other in 1973.

Well within the next four years, the total capacity of our nuclear stations will be 5,200,000 kilowatts, 26 times what it is today. That is far more electricity than the entire city of Chicago now uses.

By then, we will have spent nearly one billion dollars to develop nuclear power, to keep pace with your growing demand for electricity without emitting pollutants.

We have spent and are spending millions more for the most modern dust-collecting precipitators, for gas turbines, and for the conversion of coal-burning units to other fuels.

Commonwealth Edison's total activities to reduce and prevent air pollution add up to the greatest single effort we know of to clean the air.

Commonwealth Edison Company

DRAFT — NOT FOR PUBLICATION

DEFENDANT'S EXHIBIT 101

COAL STRIP MINING - IS IT REACHING A PEAK?

by

Hubert E. Risser
Assistant Chief and Principal Mineral Economist
Illinois State Geological Survey
Urbana, Illinois

For about half a century, strip mining has been providing an ever-increasing share of total coal output in the United States, and in the past 30 years this share has grown from less than 8 percent to 33.7 percent, as shown in Figure 1. The graph also shows that strip mining is gaining faster in the West than in the East.

From 1961 to 1967, output from strip mines grew 63.6 million tons, or 52.2 percent. Certainly there is nothing in such performance to indicate any peaking in the level of strip coal-mine production. But the fact is that, if not in actual tonnage, strip mining appears to be reaching its peak in relative importance, at least east of the Mississippi River. And the area east of the Mississippi provides 90.0 percent of the strip and 94.9 percent of the total coal production of the nation.

The relative economic advantage which spurred strip mining's growth for a third of a century has been diminishing markedly in recent years. Figure 2 shows evidence of this decline. From 1947 until 1961, strip tonnage output remained fairly stable, at the end of the period showing only a 12.5 percent decline. Meanwhile, underground coal production fell 44.5 percent. As the result of the greater decline in underground coal, strip coal in 1961 furnished 30.3 percent of the total coal produced, compared to only 22.1 percent in 1947.

In the succeeding 6 years, however, underground coal output increased by 76.5 million tons, while strip output increased only 63.6 million.

Further evidence of the strengthening of underground coal's relative position - or if you will, the weakening of strip coal's position - can be found in the major coal stripping states, Illinois, West Kentucky, Ohio, Pennsylvania, Indiana, and West Virginia, which in 1966 provided 80 percent of the nation's strip coal. Figure 3 shows what has been happening in three states lying in the Appalachian field and in the total output of these three states. In the figure, the column height represents the output of coal mined by all methods. The number at the base of each column is the percentage mined by stripping.

Presented at the Fall Meeting of The Society of Mining Engineers, Minneapolis, Minnesota, September 18, 1968.

In Pennsylvania and Ohio, the percentage of strip mining increased between 1956 and 1961, but by 1966 had declined from the 1961 level. In West Virginia a decline occurred during the first 5 years but was followed by a rise.

In January 1968, Coal Age published an article listing the locations and capacities of new large mines in the planning and construction stages that would be operating by 1968-1971.

The plans for West Virginia and Pennsylvania indicated all the new mines would be underground. Except to the extent they might replace existing underground capacity, the new mines will increase the dominance of underground coal. Announced capacity for Ohio is 24.7 percent strip, which is much below the present level.

Figure 4 shows similar data for Illinois, West Kentucky, and Indiana individually and combined. The percentage of strip mining grew for each of the 5-year periods in Illinois and West Kentucky. During the second 5-year period, however, the increase was considerably less. In these states the projected new capacity should also exert a downward pressure.

Alone among the states illustrated, Indiana shows a strong tendency toward an increase in the relative position of strip mining.

If strip mining actually is destined to provide a smaller share of total coal output, as the evidence indicates, the cause must lie in a diminution of the economic advantage that strip mining has enjoyed in the past. The narrowing of this advantage appears to be taking place in a number of ways.

PRODUCTIVITY OF WORKMEN

From the beginning, the output per man day, or as it is more commonly stated, manshift, in strip mining has been well above that in underground mining. Figure 5 shows the increasing spread in tons per manshift in strip and underground mining. In 1943 the figures were 15.46 tons per man day for strip mining compared to 5.04 for underground mining. With the improvement of methods and equipment during the succeeding two decades, the output per manshift by 1966 had risen to 33.6 tons for strip and 14.6 tons for underground mining.

Despite the increasing spread in average productivities, the difference in labor costs per ton between the two methods has been diminishing. The reciprocal of tons per manshift, or the fraction of a manshift per ton, provides better comparison of cost, for it is a measure of the time spent on a unit of output. Man days per ton are shown in Figure 6. Also shown is the decline in the margin of advantage held by strip mining. Whereas in 1956 it took an average of .069 of a shift more labor to produce a ton by underground mining than by strip mining, in 1966 the difference was only .039 of a shift. If, for example, we assume an average wage of $28.00 per shift for both types

of mining, then stripping's margin of labor advantage would have been reduced from $1.93 to $1.09. More accurate comparisons of changes over a period of time must, of course, consider changes in wage rates and different wage rates for different types of labor.

Figure 7 shows changes in the margins for five important strip mining states. In all areas, the margin has been shrinking. The size of the margin in labor costs is, of course, only one of the things that govern whether strip or underground mining will be used. Many other factors, both physical and economic, are involved.

OVERBURDEN AND STRIPPING EQUIPMENT

As strip mining has progressed, the average depth of overburden and the ratio of overburden to coal have been gradually increasing (Figure 8). The reported average depth of overburden for coal strip mines in the United States increased from 31.6 feet in 1946 to 41.6 in 1955 and to 50.1 in 1965. Cubic yards of overburden per ton of coal increased from 9.1 cubic yards in 1946 to 12.3 in 1955 and to 12.8 in 1965.

Figure 8 shows changes in the thickness of both overburden and coal in strip mines of the major producing areas. The thickness of coal mined has, in general, remained relatively stable, and in some states the reported average ratio of overburden to coal has shown no major change. In all states, however, the average depth has changed significantly. Not shown on Figure 8 is the increase in maximum depth, which in some states now exceeds 100 feet.

The use of larger equipment has enabled coal strippers to handle the thicker overburden economically, either by using larger single units or units working in tandem. Since the mid-1950s, shovel capacities have increased from about 65 cubic yards to 115 cubic yards in 1959 and to 180 cubic yards in 1966, with still larger shovels scheduled soon. Draglines have shown a similar growth in size. While such equipment is physically capable of moving deeper and deeper overburden, the performance increase is not always proportional to the investment cost. For example, a 100-cubic yard shovel operating at a depth of 92 feet can handle somewhat more than twice the volume of a 45-cubic yard shovel operating in 52 feet of overburden. But operating under these conditions for the same thickness of coal, net increase in coal availability would be less than 20 percent. Since the purchase price of the larger shovel will be two to three times that of the smaller, shovel investment and depreciation per ton of coal, as well as shovel operating costs, are greatly increased. Thus, the margin of cost, or the advantage of stripping over underground mining, tends to narrow with the depletion of shallow reserves and increase in overburden thickness.

RESERVE REQUIREMENTS AND COSTS

During the 32 years from 1935 through 1966, the cumulative total of coal strip mined in the United States was almost 3.5 billion tons. Even if it were assumed strip mining were to show no annual tonnage gain and remain at its 1966 level, the next 3.5 billion tons would require only slightly more than 18 years to produce.

U. S. Bureau of Mines figures show that the average thickness of coal mined by strip mining in 1965 was 5.2 feet. Calculations based on this thickness indicate that the mining of 3.5 billion tons would require the uncovering of 466 thousand acres of coal, assuming coal in the ground at 1800 tons per acre-feet and 80 percent recovery.

The problem of future reserves of strip coal will not be as much one of scarcity as of availability. Studies by the Illinois State Geological Survey indicate that in Illinois alone the coal lying under overburden of 100 feet or less thick amounts to more than 3 times 3.5 billion tons. The problem, east of the Mississippi, at least, will be one of piecing together coal and surface rights to make a block sufficiently large for an economical operation.

Large outputs over a long period of years are required to justify and amortize the investments in equipment for handling thick overburden. In 1965 the outputs of the 10 largest strip mines in the United States ranged from 2.2 to 3.8 million tons. Twenty-five years' output would be 55 to 95 million tons. In 6-foot coal at 80 percent recovery, 4770 to 8246 acres would be required. In 4-foot coal the acreages would be increased 50 percent. For most economic mining, each acreage should preferably be in a single block to avoid the moving of giant equipment. Coal stripping companies, unless they already possess the required reserves, will face increasing difficulty in piecing together blocks of such size.

RECLAMATION

Progressive strip mining operators have engaged in stripped land reclamation for many years. In recent years, however, states in increasing numbers have been passing new and more stringent laws governing the type and degree of reclamation or restoration that must be attained. The cost per acre reclaimed for any required degree of reclamation depends on many things, among which are the depth of overburden, the type of stripping equipment that has been used, and the chemical and structural character of the overburden material.

Reported reclamation costs for acreages of coal lands reclaimed in 1964 ranged from less than 100 dollars per acre for partial reclamation of one small area to almost 1000 dollars per acre for another area. The overall average for partial reclamation of 11,185 acres was 149 dollars per acre. Average cost for completely reclaiming 21,541 acres was reported at 230 dollars per acre.[1]

Figure 9 shows the cost per ton of coal for various thicknesses of coal at an assumed cost per acre reclaimed.

That increased requirements for reclamation will bring increased costs for strip mining has been recognized by TVA and that agency's contracts for coal are based on prices that cover these costs.

LAND ACQUISITION COSTS

There has been a steady rise in land and real estate prices in recent decades. U. S. Department of Agriculture indexes of the average value of farm land and buildings show the following changes:

	Index 1957-1959 = 100		Percent increase
	1960	1968	1960-1968
U. S.	111	170	53.2
Illinois	106	156	47.2
Indiana	107	165	54.2
Kentucky	112	175	56.3
Ohio	105	153	45.7
Pennsylvania	111	171	54.1
West Virginia	110	150	36.3

The average total increase for the United States in the 8-year period was 53.2 percent. The increase varied considerably from place to place. For individual states shown, it ranged from 36.3 percent in West Virginia to 56.3 percent in Kentucky. However small or great the increase, wherever surface rights must be acquired land price trends are one more factor diminishing the economic advantage that strip mining possesses.

Figure 9 can be used to estimate the effects of inflation in land costs. If, for example, the land cost in an area where coal averaged 4 feet thick were to increase from 400 dollars per acre to 600 dollars per acre, the cost per ton of coal would increase 3.48 cents.

SUMMARY

For half a century the percentage of coal production provided through strip mining has steadily increased. Recent trends indicate that a peak in percentage, if not in tonnage, is being approached. Important among the reasons for this is the decline in economic advantage enjoyed by strip mining compared to underground mining. Among the factors contributing to this decline are the following:

1. Decrease in the margin of advantage in manpower requirements held by strip mining.
2. Increase in depth and volume of overburden necessitating larger equipment and investment of more capital.
3. Increasing scarcity of reserve blocks of land big enough to support extensive mining operations.
4. Increasingly stringent legislation for reclamation of stripped land and the resulting higher cost of reclamation.
5. Increasing cost of land surface rights..

1/ Surface Mining and Our Environment, U. S. Department of the Interior, 1967, Appendix I, Table 5.

In the eastern part of the United States there has already been a peaking and decline in the relative importance of strip mining in some major coal producing states. Although it is not clear at what point the pressures discussed above will cause a peaking for the region as a whole, the trends indicate that this definitely is on the way.

In the less populated states of the West, some of the pressures are less severe. This is especially true of those pressures related to conflicting or competitive land uses that affect the availability of reserves and cost of land. The other pressures, although they may not become sufficiently strong to cause a decline in western strip mining's relative importance, will, nevertheless, reduce to an increasing degree the advantage that strip mining has possessed.

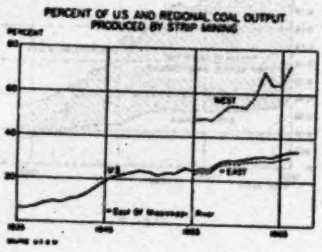


Fig. 1

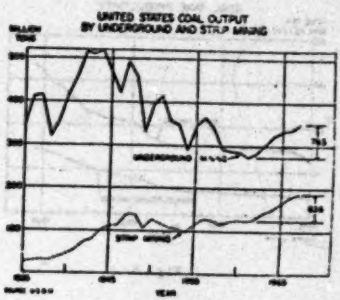


Fig. 2

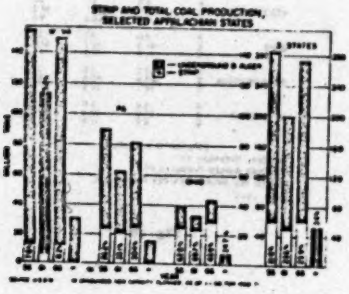


Fig. 3

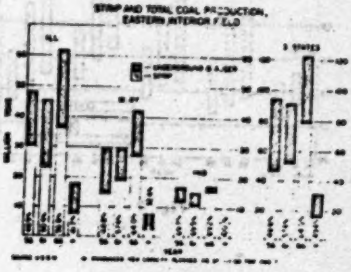


Fig. 4

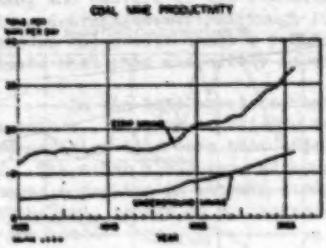


Fig. 5

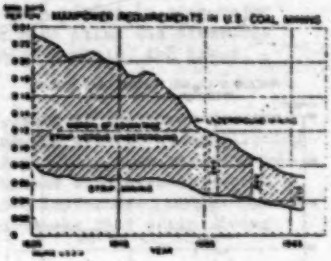


Fig. 6

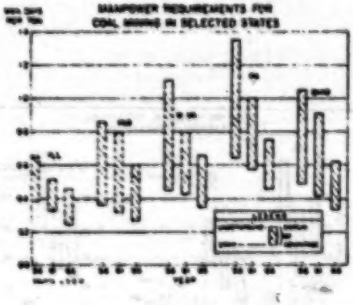


Fig. 7

STRIPPING DATA, AVERAGES, FOR SELECTED AREAS

AREA	ITEM	YEAR		
ILLINOIS	A			
	B			
	C			
INDIANA	A			
	B			
	C			
KENTUCKY	A			
	B			
	C			
OHIO	A			
	B			
	C			
PENNSYLVANIA	A			
	B			
	C			
W. VIRGINIA	A			
	B			
	C			

EXPLANATION OF ITEM
A - COAL THICKNESS, FT
B - OVER BURDEN THICKNESS, FT
C - MANPOWER PER TON OF COAL

Fig. 8

ESTIMATED COST OF LAND RECLAMATION

COAL THICKNESS IN FEET	MANPOWER COST PER ACRE						
	COST IN CENTS PER TON *						

* BASED ON

Fig. 9

Supreme Court, U. S.
FILED
OCT 10 1973
MICHAEL RODAK, JR., CLERK

APPENDIX

(Pages 921-1380)

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1978

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

		Page
Government Exhibits:		
GX 1—	Annual Report of General Dynamics Corporation 1960	1
GX 2—	Annual Report of General Dynamics Corporation 1961	3
GX 3—	Annual Report of General Dynamics Corporation 1962	5
GX 4—	Annual Report of General Dynamics Corporation 1963	6
GX 5—	Annual Report of General Dynamics Corporation 1964	7
GX 6—	Annual Report of General Dynamics Corporation 1965	8
GX 7—	Annual Report of General Dynamics Corporation 1966	9
GX 24—	Chart entitled "The United Electric Coal Companies Fixed Assets, Long Term Indebtedness, Working Capital and Net Assets or Stockholders Equity 1940 to 1967"	10

Government Exhibits:—Continued		Page
GX 25—	Chart entitled "The United Electric Coal Companies Net Sales, Earnings Before Income Taxes, Net Earnings, and Net Earnings as a Percentage of Net Sales 1940 to 1968"	12
GX 26—	Standard & Poor's Industry Surveys—"Coal," April 28, 1966, Section 2, Basic Analysis	13
GX 27—	Letter dated March 26, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Declared and Paid by UEC during the period January 1, 1950 to December 31, 1967	29
GX 29—	Standard Industrial Classification Manual 1967	33
GX 31—	Chart entitled "The Consumption of Fuel by Steam-Electric Plants in the Eastern Interior Province Sales Area for the Years 1960-1967"	37
GX 32—	Chart entitled "Consumption of Fuel (Shown in Millions of BTU's) by Portland Cement Plants in Illinois in 1967" and Chart entitled "Consumption of Fuel by Portland Cement Plants in Eastern Interior Coal Province Sales Area in 1967"	38
GX 34—	Financial Statements: The United Electrical Coal Companies; Year Ended December 31, 1968	40
GX 35—	City, Water, Light & Power (Springfield) letter to Department of Justice dated March 21, 1968	42
GX 36—	Illinois Power Company letter to Department of Justice dated March 21, 1968	46
GX 37—	Dairyland Power Cooperative letter to Department of Justice dated April 23, 1968	53
GX 39—	Corn Products Company letter to Department of Justice dated May 24, 1968	57
GX 41—	Union Carbide Corporation letter to Department of Justice dated August 2, 1968	60
GX 43—	Dundee Smith Company letter to Department of Justice dated August 22, 1968	62
GX 49—	A Staff Report on National Gas Supply and Demand by the Federal Power Commission	65
GX 51—	Chart entitled "Coal Shipments to Illinois Destinations by District of Origin, 1965 to 1967"	67
GX 52—	Chart entitled "1967 Sales of Coal in the Eastern Interior Coal Province Sales Area by Coal Producers Located in Illinois, Indiana and Western Kentucky"	68
GX 54—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Crown Mine to Customer Destinations, 1967	73
GX 55—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 3 Mine to Customer Destinations, 1967	74

Government Exhibits:—Continued Page

GX 56— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 4 Mine to Customer Destinations, 1967 ____ 75

GX 57— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 5 Mine to Customer Destinations, 1967 ____ 76

GX 58— The United Electric Coal Companies; Shipments of Coal in Tons from the Banner Mine to Customer Destinations, 1967 ____ 77

GX 59— The United Electric Coal Companies; Shipments of Coal in Tons from the Cuba-Buckhart Mines to Customer Destinations, 1967 ____ 78

GX 60— The United Electric Coal Companies; Shipments of Coal in Tons from the Fidelity Mine to Customer Destinations, 1967 ____ 79

GX 61— Chart entitled "Total Coal Consumption in Tons in 1967 by Steam Electric Plants in the Eastern Interior Coal Province Sales Area and the Total Sales of Coal in Tons in 1967 from Mines located in the Eastern Interior Coal Province to Steam Electric Plants in the Eastern Interior Coal Province Sales Area" ____ 80

GX 62— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1957 Calendar Year" ____ 81

GX 63— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1958 Calendar Year" ____ 82

GX 64— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1959 Calendar Year" ____ 83

GX 65— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1960 Calendar Year" ____ 84

GX 66— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1961 Calendar Year" ____ 85

GX 67— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1962 Calendar Year" ____ 86

GX 68— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1963 Calendar Year" ____ 87

GX 69— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1964 Calendar Year" ____ 88

GX 70— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1965 Calendar Year" ____ 89

Government Exhibits:—Continued Page

GX 71— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1966 Calendar Year" ____ 90

GX 72— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1967 Calendar Year" ____ 91

GX 73— Chart entitled "Production of Coal in Illinois by the Top Two, the Top Four, and the Top Ten Producers, 1957-1967, and their Percentage of Total Production for These Years" ____ 92

GX 74— Chart entitled "Sales of Coal in Illinois by the Leading Companies and Their Subsidiaries in 1967 (From Mines Located in Eastern Interior Coal Province)" ____ 93

GX 75— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1957" ____ 94

GX 77— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1959" ____ 96

GX 85— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1967" ____ 98

GX 86— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky, 1957-1967" ____ 100

GX 87— Chart entitled "Acquisitions in the Eastern Interior Coal Province since 1954" ____ 101

GX 88— Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1965" ____ 107

GX 89— Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1966" ____ 111

GX 90— Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1967" ____ 114

GX 91— Chart entitled "Per Cent of Sales of Each Company to Identical Customer Facilities by The United Electric Coal Companies and Freeman Coal Mining Corporation for the Year 1965-1967" ____ 117

GX 93— Central Illinois Public Service Company letter to Department of Justice dated October 28, 1966 ____ 118

Government Exhibits:—Continued	Page
GX 94— Illinois Power Company letter to Department of Justice dated October 17, 1966	121
GX 104— Central Illinois Electric and Gas Company letter to Department of Justice dated October 20, 1966	124
GX 185— March 26, 1970 Petition of Commonwealth Edison to form subsidiary	126
GX 200— United Electric Coal Companies, Board of Directors Minutes—1959	132
GX 201— United Electric Coal Companies, Board of Directors Minutes—1960	133
GX 210— Testimony of Jack Simon before Illinois Commerce Commission	134
GX 219— Keystone Coal Buyers Manual 1967	137
GX 282— Article entitled "The Energy Outlook", by Gerber and Netschert, entered in the IEEE Spectrum, June 1969	144
GX 283— Speech by J. Cordell Moore entitled "The Future Role of Fossil Fuels in Electric Power Generation," at the American Power Conference luncheon in 1968	167
GX 289— Article entitled "New Horizons for Coal—the Comeback Industry", by Robert E. Lee Hall, printed in *The Commercial and Financial Chronicle*, dated March 7, 1968	176
GX 247— Article entitled "Natural Gas Fiasco", printed in *Barron's*, October 18, 1969	189
GX 253— Article entitled "Nuclear Power Economics," 1968-1969 Report by Philip Sporn to the Joint Congressional Committee on Atomic Energy, reprinted in CCH ¶ 3043	194
Defense Exhibits:	
DX 1— October 9, 1957 memorandum from Frank Kolbe to R. J. Hepburn re punch mining	197
DX 2— October 18, 1957 letter from J. M. Morris to Frank Kolbe re Northern States Power Company, Displacing gas with coal	198
DX 3— June 19, 1958 letter from A. J. Christiansen to A. H. Truax with three page attachment	199
DX 4— July 1, 1958 letter from J. M. Morris to Frank Nugent	204
DX 5— July 11, 1958 letter from R. J. Hepburn to Frank Kolbe with two page attachment	206
DX 6— August 4, 1958 letter from "President" to Mr. Justin Potter	209
DX 7— November 21, 1958 *Wall Street Journal* article "General Dynamics Seeks To Acquire Chicago Building Firm"	210

Defense Exhibits:—Continued		Page
DX 8—	December 11, 1958 letter from Geo. Robert Boller to F. F. Kolbe with one page attachment	212
DX 9—	February 5, 1959 letter from Frank Nugent to F. F. Kolbe	214
DX 11—	May 27, 1959 letter from R. J. Hepburn to F. F. Kolbe	215
DX 12—	October 2, 1959 Paul Weir Co. report to F. F. Kolbe	216
DX 13—	May 27, 1960 letter from T. H. Latimer to R. J. Hepburn	224
DX 14—	August 23, 1960 letter from J. M. Morris to C. Evans Parks, Iowa Southern Utilities Co.	226
DX 15—	September 7, 1960 letter from J. M. Morris to H. L. Mann	228
DX 16—	September 13, 1960 letter from H. L. Mann to J. M. Morris	229
DX 17—	November 15, 1961 letter from J. M. Morris to H. L. Mann	230
DX 18—	June 12, 1962 memorandum from R. J. Hepburn to J. M. Morris re Preliminary Report Sunshine Coal Property, Centerville, Iowa	231
DX 19—	November 30, 1962 letter from H. L. Mann to Robert J. Hepburn	235
DX 20—	December 10, 1962 letter from Robert J. Hepburn to H. L. Mann re Iowa Coal Field	237
DX 21—	March 8, 1963 letter from R. J. Hepburn to J. M. Aiken	238
DX 22—	May 19, 1964 letter to Frank Nugent enclosing one page draft letter to Arch Kraakevik of Illinois Power Co.	239
DX 23—	June 16, 1964 memorandum from Irving Crown to Frank Nugent with four page attachment	241
DX 24—	June 29, 1965 memorandum from J. M. Morris to R. H. Inman et al. re Industry field	246
DX 25—	October 27, 1965 letter from J. M. Morris to Frank Nugent with one page attachment	247
DX 26—	January 5, 1966 letter from Q. W. Wellington to J. M. Morris	249
DX 27—	March 8, 1966 memorandum from Dale H. Emling to J. M. Morris with two page attachment	250
DX 28—	March 14, 1966 letter from J. M. Morris to Frank Nugent	252
DX 29—	July 13, 1966 memorandum from D. H. Emling to R. H. Inman	253
DX 30—	July 29, 1966 memorandum from R. H. Inman to T. H. Latimer, et al.	254
DX 31—	August 9, 1966 memorandum from D. H. Emling and B. C. Jensen to R. H. Inman re Star Lake Field, McKinley County, New Mexico	255

Defense Exhibits:—Continued Page

DX 32— September 12, 1966 letter from J. Morris to Frank Nugent ____ 256
DX 33— October 18, 1966 memorandum between R. H. Inman and T. H. Latimer ____ 257
DX 34— July 31, 1967 letter from Jack A. Simon to Frank Nugent ____ 259
DX 35— September 31, 1968 four-page coal contract between UEC and Central Illinois Light Co. ____ 262
DX 36— September 5, 1969 letter from John Welsh, Caterpillar Tractor Co., to Reuben Hedlund re coal versus gas feasibility study ____ 263
DX 37— September 12, 1969 letter from John T. Cusack to Reuben L. Hedlund ____ 264
DX 38— 1965 Annual Report Zeigler: Coke Company ____ 267
DX 39— 1966 Annual Report Zeigler: Coke Company ____ 270
DX 40— 1967 Annual Report Zeigler: Coke Company ____ 272
DX 41— 1968 Annual Report Zeigler: Coke Company ____ 274
DX 42— Report to shareholders, three months ended March 31, 1969, Zeigler: Coke Company ____ 278
DX 43— Report to shareholders, six months ended June 30, 1969, Zeigler: Coke Company ____ 281
DX 44— Report to shareholders, nine months ended September 30, 1969, Zeigler: Coke Company ____ 284
DX 45— Statement by Assistant Attorney General Richard W. McLaren to the Cabinet Task Force on Oil Imports, August 8, 1969 ____ 287
DX 46— The Answers of Plaintiff to Interrogatories of Defendants 1(a)-1(g), 1(j), 6-8, 13-15, 17, 18, 20, 21, 23, 26, 27, 30, 37, 44-46, 50, 51 and 54 ____ 295
DX 47— May 29, 1969 letter from John T. Cusack to Reuben L. Hedlund ____ 302
DX 48— December 15, 1954 letter by George P. Harrington, President, Chicago, Wilmington and Franklin Coal Company to its stockholders ____ 340
DX 49a— Subpoena Questionnaire form and related court orders ____ 345
DX 49— Producer data exhibits, mine characteristics ____ 397
DX 50— Producer data exhibits, comparison of leading producers with other producers ____ 411
DX 51— Producer data exhibits, coal characteristics by producing districts ____ 419
DX 52— Producer data exhibits, overburden of strip mines and depth of deep mines ____ 447
DX 53— Consumer data exhibits, boiler specifications ____ 458
DX 54— Consumer data exhibits, types of sales by producing districts ____ 461
DX 55— Consumer data exhibit, analysis of consumption and production of coal by freight rate districts ____ 462

Defense Exhibits:—Continued		Page
DX 56—	Government questionnaire data analysis of consumption and production of coal by freight rate districts	481
DX 57—	1960 utility use of Illinois coal	506
DX 58—	Coal sold under contract	508
DX 59—	Analysis of potential and actual use of fuels other than coal by coal consuming facilities	509
DX 60—	UEC coal reserve data: (a) Summary, UEC coal reserves as of December 31, 1969; (b) United Electric Coal Company's lands and reserve coal, July 31, 1958 through December 31, 1969; (c) Memos on changes in reserve tonnage 1958 through 1969; (d) Potential acquisitions	517
DX 61—	Coal reserves of listed companies in Illinois, Indiana and Western Kentucky 1968	577
DX 62—	Types of coal reserves held by listed companies in Illinois, Indiana and Western Kentucky 1968	578
DX 63—	United Electric Coal Company's committed and uncommitted reserves—by mines	579
DX 66—	May 21, 1968 letter from Wisconsin Electric Power to John T. Cusack	580
DX 67—	Attachments dated February 12, 1968, February 13, 1968, and February 23, 1968 to letter of May 24, 1968 from Corn Products to John Cusack	582
DX 68—	August 15, 1968 letter from Thompson, Hine & Florey to John Cusack	587
DX 69—	September 17, 1968 letter from General Portland Cement to Ronald Futterman	588
DX 70—	September 29, 1969 letter from Mississippi River Corporation to Hugo Sims	590
DX 71—	May 27, 1968 letter from Hall, Patterson, Taylor, McNicol & Marett to John Cusack	591
DX 72—	May 20, 1968 leter from Inland Steel Company to John Cusack with two page attachment	594
DX 73—	November 28, 1966 letter from Vulcan Materials to John Cusack	599
DX 74—	September 11, 1968 letter from River Cement Company to Edwin M. Zimmerman	600
DX 75—	January 24, 1969 letter from Missouri Portland Cement Company to John Cusack	603
DX 76—	December 23, 1966 letter from Norman, Englehardt, Zimmerman, Frankie & Lauritzen to Bertram Long with attachment	604
DX 77—	October 21, 1966 letter from CILCO to Bertram Long	607
DX 78—	September 22, 1969 letter from Missouri Portland Cement Company to Hugo Sims	608
DX 80—	Certified copy of respondent's Exhibit No. 184A-F received in evidence in FTC Dkt. 8765 in the matter of Kennecott Copper Corporation	610

Defense Exhibits:—Continued		Page
DX 81—	1968 Annual Report of Standard Oil Company (New Jersey)	617
DX 82—	Plaintiff's proposed findings of fact 5a, 5b, 5b(2), 5d(4) and 5e(3), *United States* v. *Standard Oil Company* (New Jersey et al.), Civ. No. 954-64, D. N.J. (1964)	623
DX 83—	Plaintiff's memorandum accompanying plaintiff's proposed findings of fact and conclusions of law, *United States* v. *Standard Oil Company* (New Jersey, et al.), Civ. No. 954-64, D. N.J. (1964)	626
DX 84—	Final judgment in *United States* v. *Peabody Coal Company et al.*, Civ. No. 67 C 1621 (N.D. Ill. 1967)	640
DX 85—	"Interfuel Competition and Changes in the Coal Industry Since World War II," report and statistics by Dr. Bruce C. Netschert	647
DX 86—	"Structure and Geography of the Electric Utility Market for Coal," report and statistics by Abraham Gerber	733
DX 87—	Report on coal reserves and deep mining by Paul Weir Company	751
DX 88—	"Availability of Economically Mineable Strip Reserves Within the State of Illinois," report by John E. Organ, Geologist	796
DX 89—	"Impact of Sulphur Oxide Regulations on Midwest Coal Markets," report by Severaky, Environmental Dynamics Research Associates	798
DX 90—	1969 Annual Report of Commonwealth Edison	866
DX 91—	Letter of January 17, 1969 from Preston Kavanagh to Security Analysts	884
DX 92—	Letter of December 4, 1969 from Preston Kavanagh to Security Analysts	886
DX 93—	Commonwealth Edison: Profile of No. 1, *Nucleonics Week*, April 4, 11, 18 (1968)	889
DX 94—	1968 Annual Report of Commonwealth Edison	905
DX 95—	"Edison Seek A-site Downstate," *Chicago Daily News*, March 9, 1970	907
DX 96—	Advertisement entitled "Nuclear Power for Chicago," *Chicago Daily News*, March 13, 1967	908
DX 97—	Advertisement entitled "Commonwealth Edison Reports on Chicago's Air Pollution Problem," *Chicago Sun Times*, July 11, 1969	909
DX 98—	Advertisement entitled "Commonwealth Edison Reports on Progress Toward Cleaner Air," *Chicago Sun Times*, August 27, 1969	910
DX 99—	Advertisement entitled "No Smoke. No Dirt. No Fumes," *Chicago Tribune*, February 3, 1970	911

Defense Exhibits:—Continued		Page
DX 100—	Advertisement entitled "You're Looking at 20,000 Tons of Smokeless, Fumeless 'Coal'," *Chicago Tribune*, March 3, 1970	912
DX 101—	"Coal Strip Mining—Is It Reaching a Peak?" by Hubert E. Risser, Illinois Geological Survey (September 18, 1968)	913
DX 102—	Report of the National Fuels and Energy Study Group to the Committee on Interior and Insular Affairs, United States Senate, 87th Congress, 2d Session (1962)	921
DX 103—	Comparison of Coal-Fired and Nuclear Power Plants for the TVA System, June, 1966	996
DX 104—	Letter of October 17, 1962 from Elmer Hill to Barton Gebhart	998
DX 105—	Letter of October 18, 1962 from Barton Gebhart to Elmer C. Hill with two page attachment	999
DX 107—	*Central Station Nuclear Plants*, AEC Division of Industrial Participation, March 30, 1970	1003
DX 108—	AEC Release N-2, January 13, 1970, re Status Report on U.S. Civilian Nuclear Power Plants	1008
DX 110—	Chart entitled "U.S. Utility Orders for Electric Generating Equipment"	1011
DX 111—	Letters of February 19 and 22, 1968 from Richard P. Ryan, General Counsel, Humble Oil and Refining Company to John T. Cusack	1012
DX 112—	Excerpt from Minutes of Meeting of Board of Directors of General Dynamics Corporation on September 30, 1966	1015
DX 113—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies on October 9, 1959, May 13, 1960, July 15, 1960, September 9, 1960, October 28, 1960, March 10, 1961, May 12, 1961, September 8, 1961, May 18, 1962, July 13, 1962, March 8, 1963, September 13, 1963, May 8, 1964, and August 12, 1966	1022
DX 114—	Proxy statement of The United Electric Coal Companies 1954, 1955, 1956, 1957, 1958, 1959, 1960	1041
DX 116—	Nuclear Power Briefing For The Coal Industry, September 29-30, 1966. USAEC	1042
DX 136—	Advertisement entitled "Caution: Commonwealth Edison is Hazardous to your Health", *Chicago Sun Times*, July 8, 1969	1085
DX 137—	Advertisement entitled "Before everyone runs out of breath talking about pollution, we're doing something to clear the air," *Chicago Sun Times*, December 12, 1969	1086
DX 138—	1969 Steam-Electric Plant Factor	1087

Defense Exhibits:—Continued Page

DX 144— Map entitled "Investor-Owned Electric Utility Service Areas" 1098
DX 145— Map entitled "Service Area, Dairyland Power Cooperative" 1099
DX 146— 1966 Annual Report, Union Electric Company 1100
DX 147— 1967 Annual Report, Union Electric Company 1102
DX 148— 1968 Annual Report, Union Electric Company 1103
DX 149— 1968 Annual Report, Northern States Power Company 1104
DX 150— "Fuels and Fuel Transport for Electric Energy," chapter 3 of "National Power Survey," a report by the Federal Power Commission (1964) 1107
DX 151— Article entitled "Chicago's Dirty Air—A Growing Peril," *Chicago Sun Times*, October 19, 1967 1120
DX 152— Article entitled "Antipollution, Antitrust Bills Are Signed by Gov. Ogilvie," *Chicago Sun Times*, June 26, 1969 1122
DX 153— Article entitled "Crackdown on Air Pollution!" *Chicago Sun Times*, July 14, 1969 1123
DX 154— Article entitled "Edison Cuts Use Of Coal, Reduces Air Pollution," *Chicago Sun Times*, November 11, 1969 1124
DX 155— Article entitled "8 Utilities Face Pollution Probe," *Chicago Sun Times*, November 13, 1969 1127
DX 156— Article entitled "Clean-Air Edicts Offered In Council; Dimout Suggested," *Chicago Sun Times*, November 18, 1969 1130
DX 157— Article entitled "Mikva Bill Would Make Air Pollution A Federal Offense," *Chicago Sun Times*, November 20, 1969 1134
DX 158— Article entitled "Pollution Fight—Edison Tells Coal Doubts," *Chicago Daily News*, December 1, 1969 1136
DX 159— Article entitled "'Black Diamond' Boom: Kleenburn Coal Mines Enjoy Demand Surge," *The Wall Street Journal*, January 7, 1970 1137
DX 160— Article entitled "Business Bulletin—A Special Background Report On Trends In Industry And Finance," *The Wall Street Journal*, March 19, 1970 1138
DX 161— Letter entitled "The News That Nobody Prints," *Mid-West Coal Producers Institute, Inc.* 1139
DX 162— Article entitled "New Ruckus On Foreign-Oil Imports To Pin Nixon Between Pollution Issue, Coal Groups," *The Wall Street Journal*, March 5, 1970 1141

Defense Exhibits:—Continued Page

DX 163— Article entitled "Commonwealth Edison Is Allowed To Import Low-Sulphur Fuel Oil—Hickel Says One-Year License Doesn't Establish New Policy; Coal Industry Fought Action," *The Wall Street Journal*, March 26, 1970 1143

DX 164— Article entitled "The Real Meaning Of Alaskan Oil Finds," *U.S. News & World Report*, March 3, 1969 1144

DX 165— Article entitled "Petroleum Prize—Oil Firms At North Slope Race For Data As Giant Lease Sale Bidding Approaches," *The Wall Street Journal*, May 2, 1969 1146

DX 166— Article entitled "Jersey Standard Unit To Send Oil Tanker Through Northwest Passage In Test Run," *The Wall Street Journal*, June 4, 1969 1148

DX 167— Article entitled "Three Oil Companies To Study Feasibility Of Building First Coast-To-Coast Pipeline," *The Wall Street Journal*, July 24, 1969 1149

DX 168— Article entitled "Northern Natural Gas Plans Major Canada Pipeline—Cost Of System To Transport Canadian Gas To The U.S. Put At About $1.4 Billion—Government Approval Needed," *The Wall Street Journal*, April 1, 1969 1150

DX 169— Article entitled "People Gas Unit Plans To Buy Midwest Area's First Gas From Canada," *The Wall Street Journal*, June 18, 1969 1151

DX 170— Article entitled "Alberta Agency Backs Northern Natural On Bid To Export Gas To U.S. Midwest," *The Wall Street Journal*, December 17, 1969 1152

DX 171— Article entitled "Consumers Power Announces Plans For Atomic Plant—Dow Chemical Will Be Chief Customer Of New Facility; Cost Put At $267 Million—Completion Is Slated In 1975," *The Wall Street Journal*, December 15, 1967 1153

DX 172— Article entitled "Jersey Standard Joins List Of Companies To Make Nuclear Fuel—Subsidiary To Build Plant In 1970 In Washington State; Research Assigned To Battelle Institute," *The Wall Street Journal*, March 20, 1969 1154

DX 173— Article entitled "In 1970: 23 Utilities Will Ask Bids On 29 Nuclear Units," *Nucleonics Week*, January 15, 1970 1155

DX 174— Article entitled "The Anti-Atom Nuts," *Chicago Tribune*, January 20, 1970 1156

DX 175— Article entitled "Consumers Power Announces Plans For New Plant—Pumped Storage Facility Set For 1973: Detroit Edison To Share Cost And Output—Outlay To Total $186 Million," *The Wall Street Journal*, November 28, 1967 1157

Defense Exhibits:—Continued Page

DX 176— Article entitled "FPC Aide Again Approves Con Edison Bid To Build Power Project; Protests Likely," *The Wall Street Journal*, August 7, 1968 ____ 1158

DX 177— Article entitled "TVA Plans To Start $155 Million Project At Raccoon Mountain—Plan Will Include 4 Reversible Pump-Turbine Units With Total Capacity Of 1.4 Million Kilowatts," *The Wall Street Journal*, January 19, 1970 ____ 1159

DX 178— Article entitled "Geophysics," *Time Magazine*, July 26, 1968 ____ 1160

DX 179— Article entitled "Earth's Own Power Source," *Chicago Daily News*, January 9, 1969 ____ 1161

DX 180— Article entitled "Burning Refuse To Be Used In 'Total Energy' Concept," *The Wall Street Journal*, June 23, 1969 ____ 1162

DX 181— Excerpt from transcript of Hearings before the Joint Committee on Atomic Energy, 99th Congress, 2d Session, on Participation by Small Electrical Utilities in Nuclear Power.—(Part 1-April 30-May 3, 1968), "Affiliation Is Fast Becoming A Necessity." ____ 1163

DX 182— Article entitled "New England Affiliation Slated —Utiilty Concerns Plan Affiliation," *New York Times*, June 12, 1968 ____ 1164

DX 183— Article entitled "Boards of Iowa P&L And Iowa-Illinois G&E Approve Merger Plan—New Entity, Iowa Energy Corp., Plans To Retire The 2 Utilities' Outstanding Preferred Shares," *The Wall Street Journal*, July 22, 1969 ____ 1165

DX 184— Article entitled "Ayrshire Collieries Asks Bids of 5 Firms—Coal Concern Invites Offers To Purchase Or Merge With It; Replies Expected Next Month," *The Wall Street Journal*, November 27, 1968 ____ 1166

DX 185— Article entitled "Ashland Oil Plans To Buy Or Lease Ayrshire Assets—Boards Vote Proposal That Includes The Sale Of Coal Royalties To Third Firm—Pact Involves $125 Million," *The Wall Street Journal*, January 22, 1969 ____ 1167

DX 186— Article entitled "Metal Climax, Ayrshire Sign Merger Accord—Acquisition Of Coal Producer By Metals Firm Valued At Minimum Of $62.6 Million—Boards And Holders To Vote," *The Wall Street Journal*, April 24, 1969 ____ 1168

Defense Exhibits:—Continued		Page
DX 187—	Advertisement entitled "Air Pollution Authorities Urge Use Of 'Clean-Burning' Natural Gas—Today, More and More Apartment Building Owners Are Turning To Gas Heat. Things Stay Cleaner Inside And Out," *Chicago Sun Times*, May 16, 1967	1169
DX 188—	Advertisement entitled "1977 The Year Our City Died." *Philadelphia Inquirer*, December 4, 1967	1170
DX 189—	Advertisement entitled "You Can Heat 2½ Houses With Modern Oil For What It Costs To Heat 1 House With Electricity!"	1171
DX 190—	Advertisement entitled "We're Helping Main Street Switch To Nuclear Power."	1172
DX 191—	Advertisement entitled "This Pollution Was Caused By Burning Money. How Much Of It Was Yours?" *Fortune*, March 1, 1968	1173
DX 192—	Advertisement entitled "What's Gas Energy Doing To Make Industry Nice To Be Near?" *American Gas Association, Inc.*	1174
DX 193—	Advertisement entitled "How Nuclear Science May Give America More Gas Energy." *American Gas Association, Inc.*	1175
DX 194—	Advertisement entitled "Boiler Conversion?"—"Get The 5 Advantages Gas Power-Type Burners Give You In Full Measure."—"Midco Converts An Apartment And The Service Staff Is Cut By 2/3." *American Gas Association, Inc.*	1176
DX 195—	Advertisement entitled "Who Offers You 24-Hour Plant Site Location Service On The 60-Mile Illinois Shore? Peoples Gas, Of Course." *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1177
DX 196—	Advertisement entitled "The Not-So-Brief Case For Complete Chicagoland Plant Site Information," *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1178
DX 197—	Advertisement entitled "The Perfect Salt Substitute," *American Natural Gas Company*	1179
DX 198—	Advertisement entitled "St. Louis' Tallest Office Building Will Be Total Energy All The Way," *The Wall Street Journal*, May 13, 1969	1180
DX 199—	Advertisement entitled "The Savings And Loan That Saves With Natural Gas," *American Gas Association, Inc.*	1181
DX 200—	Advertisement entitled "Natural Gas Energy . . . The Electrifier—Pretty Soon You May Be Making Your Own Electricity From Natural Gas."	1182

Defense Exhibits:—Continued Page

DX 201— Advertisement entitled "What Do You Call It? No Matter What You Call It There's A Lot More Coming From Natural Gas Energy—There's A *Lot* More Coming From Natural Gas Energy." *Northern Illinois Gas Company* 1184

DX 202— Advertisement entitled "Another Shopping Center Finds That Making It's Own Electricity Is The Best Buy.—Waukesha Gas Energy Systems Produce Electricity For Lighting, Heating And Cooling." *American Gas Association, Inc.* 1187

DX 203— Advertisement entitled "Sheraton-O'Hare Reduces Utility Costs Over 50%. Waukesha Gas Engines Produce Electricty, Cooling and Heating." *America Gas Association, Inc.* 1188

DX 204— Advertisement entitled "Shoppers Buy All Year Round In An Ideal Climate Created With Gas Total Energy." *American Gas Association, Inc.* 1189

DX 205— Advertisement entitled "School Board Chooses Gas Heat Over Electric And Saves Over $50,000. (That's Just On First Costs. So It's Just First Savings.)" *American Gas Association, Inc.* 1190

DX 206— Advertisement entitled "This New School Uses Gas Energy For Heating, Cooling And Electric Power And Saves $1,000 a Month." *American Gas Association, Inc.* 1191

DX 207— Advertisement entitled "Gas Produces All The Energy This High School Needs (Including Electricity) At A Projected Savings of $11,639 A Year," *Fortune*, May 1968 1192

DX 208— Advertisement entitled "Williams Hardware Buys All Of Its Electricity From The Gas Company. And Saves $14,000 A Year In The Bargain," *Fortune*, November 1968 1194

DX 209— Advertisement entitled "Introducing The Gas Guitar—The Switch To Gas Total Energy Is On," *Fortune*, May 15, 1969 1196

DX 210— Advertisement entitled "Gas Air Conditioning Is Like A Car That's Better Than Good." *Northern Illinois Gas Company* 1197

DX 211— Advertisement entitled "Turn On A Party With A Gas Grill And Gaslight—We Call It The Patio Pair . . . By Charmglow." 1198

DX 212— Advertisement entitled "Now. The Gas Self-Cleaning Oven. For Builders Who Like To Build Sales. Period. It's The Biggest, Wildest, Most Exciting Gas Industry Promotion Ever. Period. The Theme Is: The Gas Self-Cleaning Oven For People Who Like To Cook. Period." *American Gas Association, Inc.* 1199

Defense Exhibits:—Continued		Page
DX 213—	Advertisement entitled "Texas Gas Invites You To The Wireless House."	1200
DX 214—	Advertisement entitled "Here's The Story Of The Gas Fuel Cell. It's Electrifying." *American Gas Association, Inc.*	1201
DX 215—	"Nuclear Steam-Generation of Electricity: Its Implication for the Future of Coal Transport by Railway and Water," by John C. Spychalski, *ICC Practitioners' Journal*, (July-August, 1967)	1202
DX 216—	"The Story of Coal," *The Petroleum Situation* (October 27, 1969 and November 28, 1969)	1215
DX 218—	Chart entitled "The Prime Interest Rate, 1928-1968," *Chicago Daily News*, December 18, 1968	1223
DX 219—	Letter dated March 9, 1970 from V. H. Clark, Secretary-Treasurer, Electric Energy, Inc., to Reuben L. Hedlund	1224
DX 220—	Letter dated June 29, 1942 from Frank F. Kolbe to B. L. Slack	1225
DX 221—	Letter dated July 23, 1954 from Frank F. Kolbe to Herman G. Schenck	1226
DX 222—	Letter dated June 11, 1956 from Frank F. Kolbe to Nye F. Morehouse	1227
DX 223—	Brochure entitled "Taum Sauk, Union Electric's Pumped—Storage Hydro Plant."	1228
DX 224—	Press release, University of Chicago, January 19, 1970	1232
DX 225—	Letter dated May 25, 1960 from Ward B. Chamberlin, Jr., Office of Chief Counsel, General Dynamics Corporation to Robert A. Bicks, Acting Assistant Attorney General, Antitrust Division, Department of Justice and exhibit C thereto.	1233
DX 227—	November 1, 1963 Memorandum from R. H. Inman to R. J. Hepburn re Freeman analysis of Kerr Mine	1236
DX 228—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies of September, 1966, pages 4386-4389	1238
DX 229—	Form 250 Response to the Court-Ordered Subpoena Questionnaire for the Freeman Coal Mining Corporation	1242
DX 230—	April 13, 1970 letter from Mr. Allen Van Wyck, Chairman of the Board of Illinois Power Company, to Donald G. Kempf, Jr.	1244
DX 231—	April 14, 1970 letter from K. E. Bowen, President of Central Illinois Public Service Company, to Donald G. Kempf, Jr.	1245
DX 232—	Brochure entitled "Low Cost Electric Power and Dependability . . . Through MAPP"	1247
DX 233—	Brochure entitled "Mid-America Interpool Network—MAIN"	1249

Defense Exhibits:—Continued Page

DX 234— 1969 Annual Report of Illinois Power Company— 1265
DX 235— Article entitled "Shortage of Low-Sulphur Coal Hampers Electric Utilities in Antipollution Efforts," *The Wall Street Journal*, April 6, 1970 — 1269
DX 236— April 1, 1970 letter from Marvin O. Young, Vice President and General Counsel for Peabody Coal Company, to Reuben L. Hedlund re coal reserves in McDonough, Schuyler, Adams, Brown and Hancock Counties (Illinois) — 1273
DX 237— Series of four tables: (1) "Fraction of Total Illinois Production of Leading Companies Other Than Peabody"; (2) "Average Production Per Company"; (3) "Changes in Concentration in Illinois Coal Production Since 1959"; (4) "Changes in Concentration in Illinois, Indiana, and Western Kentucky Since 1959" — 1274
DX 238— Telegram of March 5, 1970 from Stephen F. Dunn, President of the National Coal Association, to the President of the United States re foreign oil imports to Midwestern utilities — 1278
DX 239— Summary entitled "Proposed Plans of Compliance With Chicago Air Pollution Control Ordinance of Those Facilities for Which a Response to Court-Ordered Subpoena Questionnaire was Received"— 1279
DX 240— Excerpts from the Keystone Coal Buyer's Manual from the years 1961, 1963, and 1964 — 1282
DX 241— Excerpt from the 1968 Annual Coal, Oil and Gas report of the Illinois Department of Mines and Minerals — 1289
DX 242— Letter to Department of Justice, Chicago, Illinois from R. E. Hartmann, Alpha Portland Cement Company, dated January 22, 1969 — 1291
DX 243— Letter to John T. Cusack from Robert H. Gorske, General Counsel, Wisconsin Electric Power Company, dated May 21, 1968 — 1293
DX 252— Letter to Mr. Reuben L. Hedlund from Clayton G. Ball, Chairman of the Board, Paul Weir Company, dated June 8, 1970 — 1295
DX 254— "Abatement of Sulfur Oxide Emissions From Stationary Combustion Sources" prepared by *Ad Hoc* Panel on Control of Sulfur Dioxide from Stationary Combustion Sources, Committee on Air Quality Management Committees on Pollution Abatement and Control, Division of Engineering, National Research Council, 1970 — 1298
DX 257— West Central Region Power Survey 1970-1990, A Report to the Federal Power Commission prepared by The West Central Regional Advisory Committee — 1381

Deposition Exhibits: Page

Abrahamson Deposition Exhibit 1—Front Cover of 1967 Annual Report of Wisconsin Power & Light Company 1409
Abrahamson Deposition Exhibit 1A—Back page of 1967 Annual Report of Wisconsin Power & Light Company 1410
Beck Deposition Exhibit 1—Letter to Antitrust Division, Department of Justice, Chicago, Illinois, from C. V. Beck dated November 14, 1968 1411
Brazzale Deposition Exhibit 1—Document entitled "Heating Fuel Economic Analysis" for the Federal Office Building and United States Courthouse, Chicago, Illinois 1412
Burton Deposition Exhibit 1—Document entitled "Solicitation, Offer, and Award Contract GS-05S-4945" issued August 1, 1967 1413
Camicia Deposition Exhibit 1—Keystone's Map of the Coal Fields of the United States 1415
Gallagher Deposition Exhibit 3—Mineral Industry Surveys, Bituminous Coal and Lignite Distribution, Calendar Year 1967 1416
Griswold Deposition Exhibit 3—Report of the Secretary of Health, Education, and Welfare to the Congress of the United States entitled "Air Pollution by Federal Facilities" and dated January 1968 1456
Griswold Deposition Exhibit 4—Second Report of the Secretary of Health, Education, and Welfare to the United States Congress entitled "Air Pollution Abatement by Federal Facilities" and dated January 1969 1470
Griswold Deposition Exhibit 5—Document entitled "Operating Experience with Wet-Dolomite Scrubbing" by J. F. McLaughlin, Executive Assistant, Union Electric Co., St. Louis, Missouri, and J. Jonakin, Products Manager, Air Pollution Control Systems, Combustion Engineering, Inc., Windsor, Connecticut, presented at the Air Pollution Control Association Annual Meeting in New York City on June 22-26, 1969 1502
Jensen Deposition Exhibit 12—Memorandum from Burl C. Jensen to Mr. R. H. Inman dated June 7, 1965 1519
Jensen Deposition Exhibit 13—Memorandum from D. H. Emling and B. C. Jensen to Mr. R. H. Inman dated June 7, 1966 1521
Kolbe Deposition Exhibit 2—Annual Report of The United Electric Coal Companies 1956 1526
Kolbe Deposition Exhibit 4—Annual Report of The United Electric Coal Companies 1958 1530
Kolbe Deposition Exhibit 7—Annual Report of The United Electric Coal Companies 1961 1532
Kolbe Deposition Exhibit 12—Letter to Mr. W. B. Hillery, unsigned, by the President dated February 27, 1957 1533

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit 13—Memorandum from T. H. Latimer to Mr. F. F. Kolbe dated February 18, 1957 — 1534
Kolbe Deposition Exhibit 14—Letter from Frank Kolbe to Frank Nugent dated August 18, 1958 — 1536
Kolbe Deposition Exhibit 15—Letter from Frank Nugent to Frank Kolbe dated August 20, 1958 — 1537
Kolbe Deposition Exhibit 16—Profitability comparison between UEC and other coal mining companies (1959) — 1538
Kolbe Deposition Exhibit 17—Memorandum from R. H. Inman to Mr. Frank F. Kolbe dated November 21, 1957 — 1541
Kolbe Deposition Exhibit 33—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated May 10, 1961 — 1542
Kolbe Deposition Exhibit 42—Annual Report of The United Electric Coal Companies 1939 — 1545
Kolbe Deposition Exhibit 51—Annual Report of The United Electric Coal Companies 1948 — 1547
Kolbe Deposition Exhibit 57—Annual Report of The United Electric Coal Companies 1954 — 1548
Kolbe Deposition Exhibit 59—Paul Weir Company Valuation of Physical Assets of UEC as of December 31, 1959 — 1549
Kolbe Deposition Exhibit 60—Document entitled "Regarding Need For Additional Stripping Equipment at Fidelity Mine" dated June 17, 1966 and signed by J. M. Morris — 1562
Kolbe Deposition Exhibit 61—Contract and agreement between Alcoa and UEC dated September 5, 1956 — 1565
Kolbe Deposition Exhibit A—Comparison between Truax-Traer Coal Company and The United Electric Coal Companies — 1571
Kolbe Deposition Exhibit E—Notebook entitled "Report on Proposed Merged Illinois Operations, Truax-Traer Coal Company, January, 1956" of Theron G. Gerow, Mining Consultant and Engineer — 1587
Kolbe Deposition Exhibit L—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent — 1628
Kolbe Deposition Exhibit N—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated October 3, 1955 — 1629
Kolbe Deposition Exhibit O—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated February 16, 1960 — 1631
Kolbe Deposition Exhibit S—United States Letters Patent No. 2,325,064, dated July 27, 1943, entitled "Explosive Composition, Robert W. Lawrence, Wilmington, Delaware, assignor to Hercules Powder Company, Wilmington, Delaware, a corporation of Delaware" — 1634
Kolbe Deposition Exhibit T—Letter from Mr. LeRoy Keane, Assistant General Manager of Hercules Powder Company, to The United Electric Coal Companies dated June 27, 1956 — 1637
Kolbe Deposition Exhibit W-1—Letter from Frank Kolbe to Harry LaViers dated February 25, 1958 — 1639

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit W-2—Letter from Harry LaViers to Frank Kolbe dated March 6, 1958 ... 1640
Kolbe Deposition Exhibit W-3—Letter from Harry LaViers to Frank Kolbe dated April 28, 1958 ... 1641
Kolbe Deposition Exhibit X—Memorandum to Robert J. Hepburn from "President" dated December 3, 1957 ... 1642
Kolbe Deposition Exhibit X-1—Letter from R. J. Hepburn to Frank Kolbe dated November 29, 1957 ... 1642
Kolbe Deposition Exhibit X-2—Memorandum from T. H. Latimer to R. J. Hepburn dated November 25, 1957 ... 1643
Kolbe Deposition Exhibit Y—Memorandum from T. H. Latimer to R. J. Hepburn dated November 7, 1955 ... 1646
Kurtz Deposition Exhibit 8—Steam-Electric Plant Factors, 1968 Edition ... 1650
Kurtz Deposition Exhibit 9—Bituminous Coal Facts 1966 ... 1656
Kurtz Deposition Exhibit 10—Bituminous Coal Facts 1968 ... 1657
Latimer Deposition Exhibit 25—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated September 25, 1964 ... 1662
Latimer Deposition Exhibit 38—Memorandum from T. H. Latimer to Mr. R. H. Inman dated July 19, 1966 ... 1664
Latimer Deposition Exhibit 48—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated February 10, 1961 ... 1665
Maguire Deposition Exhibit 1—General Dynamics Proxy Statement and Agreement and Plan of Merger with respect to Material Service Corporation dated November 24, 1959 ... 1666
Maguire Deposition Exhibit 35—Excerpt from the Minutes of the Board of Directors of General Dynamics Corporation on September 30, 1966 ... 1669
Middleton Deposition Exhibit 4—Control Techniques For Particulate Air Pollutants, United States Department of Health, Education and Welfare ... 1676
Morris Deposition Exhibit 3—Memorandum dated December 17, 1959 from R. J. Hepburn to Mr. J. M. Morris ... 1678
Morris Deposition Exhibit 4—Letter from Mr. John M. Morris to Mr. Frank Nugent dated January 10, 1966 ... 1680
Morris Deposition Exhibit 5—Letter from J. M. Morris to Mr. Frank Nugent dated March 14, 1966 ... 1682
Morris Deposition Exhibit 14—Letter dated May 3, 1965 from J. M. Morris to Mr. Frank Nugent ... 1683
Morris Deposition Exhibit 31—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated January 24, 1961 ... 1686
Morris Deposition Exhibit 32—Memorandum from R. J. Hepburn to Mr. T. J. Tarzy and Mr. J. M. Morris dated February 24, 1960 ... 1688
Morris Deposition Exhibit 35—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated July 17, 1962 ... 1689

Deposition Exhibits:—Continued

Page

Morris Deposition Exhibit 38—Letter from Mr. R. J. Hepburn to Mr. John Davis dated February 3, 1960 ____ 1690
Morris Deposition Exhibit 42—Letter from Mr. J. M. Morris to Mr. Frank Nugent dated October 27, 1965 ____ 1691
Morris Deposition Exhibit 46—Memorandum from T. J. Tarzy to Mr. J. M. Morris dated February 14, 1961 ____ 1693
Morris Deposition Exhibit 47—Letter from T. H. Latimer to Mr. G. I. Grasty dated November 20, 1957 ____ 1694
Morris Deposition Exhibit 55—Letter from Mr. Frank Nugent to Mr. John Morris dated April 26, 1965 ____ 1695
Morris Deposition Exhibit 59—Letter from G. H. Utterback to Mr. Robert S. Overbeck dated November 29, 1962 ____ 1696
Morris Deposition Exhibit 60—Letter from Mr. R. S. Overbeck to Mr. G. H. Utterback dated December 18, 1962 ____ 1697
Morris Deposition Exhibit 61—Contract and Agreement between The United Electric Coal Companies and the Aluminum Company of America dated May 3, 1965 ____ 1699
Morris Deposition Exhibit 62—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent ____ 1712
Morris Deposition Exhibit 70—Letter from J. M. Morris to Mr. Francis Stanley Jordan dated June 11, 1962 ____ 1713
Morris Deposition Exhibit 76—Memorandum from T. J. Tarzy to Mr. J. M. Morris dated February 15, 1961 ____ 1714
Nix Deposition Exhibit 1—Document entitled "Term Contract Ordering Data for: FSC Group 91 Fuels, FSC Class 9110—Coal, Veterans Administration Facilities and Federal Public Buildings, within the states of Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin" for the effective period of the date of award through June 30, 1968 ____ 1715
Nugent Deposition Exhibit 1—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1959 ____ 1741
Nugent Deposition Exhibit 2—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1960 ____ 1744
Nugent Deposition Exhibit 3—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1961 ____ 1747
Nugent Deposition Exhibit 4—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1962 ____ 1750
Nugent Deposition Exhibit 5—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1963 ____ 1753
Nugent Deposition Exhibit 6—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1964 ____ 1756

Deposition Exhibits:—Continued Page

Nugent Deposition Exhiibt 7—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1965 ____ 1758

Nugent Deposition Exhibit 8—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1966 ____ 1760

Nugent Deposition Exhibit 9—Financial Reports: Freeman Coal Mining Corporaiton; Year Ended December 31, 1967 ____ 1762

Nugent Deposition Exhibit 11—Annual Report of the Chicago, Wilmington and Franklin Coal Company for the Year 1953 ____ 1764

Nugent Deposition Exhibit 16—Advertisement of Freeman Coal Mining Corporation in 1967 Keystone Coal Buyers Manual ____ 1766

Nugent Deposition Exhibit 17—Advertisement of The United Electric Coal Companies in the 1967 Keystone Coal Buyers Manual ____ 1768

Nugent Deposition Exhibit 19—Advertisement of The United Electric Coal Companies in the 1968 Keystone Coal Buyers Manual ____ 1770

Nugent Deposition Exhibit 20—Advertisement of The United Electric Coal Companies in February 1968 issue of *The Black Diamond* ____ 1772

Nugent Deposition Exhibit 22—Letter dated February 13, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Paid to MSC, Freeman, GD on the Stock of UEC, January 1, 1959 to December 27, 1967 ____ 1774

Nugent Deposition Exhibit 29—Annual Report of The United Electric Coal Companies 1964 ____ 1776

Nugent Deposition Exhibit 35—Invitation for Tenders of Common Stock of The United Electric Coal Companies by General Dynamics Corporation dated October 5, 1966 ____ 1786

Nugent Deposition Exhibit 38—Map entitled "Shipping Coal Mines In Illinois" prepared by Jack A. Simon, State of Illinois, Department of Registration and Education, State Geological Survey, dated January 1, 1966 ____ 1793

Nugent Deposition Exhibit 39—Letter from Tom Tarzy to Frank Nugent dated December 11, 1964 and Chart Showing Midwestern Coal Consumption by Utility Plants, 1963 ____ 1794

Nugent Deposition Exhibit 49—Minutes of The United Electric Coal Companies Board of Directors Meeting held October 28, 1960 re Capital Appropriation for UEC ____ 1796

Nugent Deposition Exhibit A—Letter from Frank Kolbe to Henry Crown dated October 9, 1956 ____ 1797

Deposition Exhibits:—Continued Page

Pedersen Deposition Exhibit 5—United Electric Coal Companies Computation of Provision for Federal Income Taxes, Month of October 1966 and Ten Months Ended October 31, 1966 ____ 1800
Redard Deposition Exhibit 1—Keystone Steel and Wire Company letter to Department of Justice dated April 26, 1968 ____ 1808
Simon Deposition Exhibit 1—Simon, J.A., An Evaluation of Illinois Coal Reserve Estimates, 1968 ____ 1810
Sloane Deposition Exhibit 1—Unsigned letter from the Secretary of the United Coal Companies to Mr. Robert S. Overbeck dated January 21, 1963 ____ 1821
Steiner Deposition Exhibit 1—VITA, Peter O. Steiner dated August, 1969 ____ 1823
Steiner Deposition Exhibit 2—*U.S.* v. *General Dynamics, et al.*, Memorandum of Expected Testimony of Peter O. Steiner, Professor of Economics and Law, University of Michigan dated August 14, 1969 ____ 1828
Terleke Deposition Exhibit 2—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1957-1958 ____ 1837
Terleke Deposition Exhibit 11—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1966-1967 ____ 1841
Weir Deposition Exhibit 1—Shipping Coal Mines (Map), Illinois, Indiana, West Kentucky. ____ 1845
Weir Deposition Exhibit 8—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated August 5, 1959 ____ 1846
Weir Deposition Exhibit 19—Brochure entitled "Paul Weir Company" ____ 1847

DX 102

87th Congress
2d Session
COMMITTEE PRINT

REPORT

OF THE

NATIONAL FUELS AND ENERGY STUDY GROUP

ON

AN ASSESSMENT OF AVAILABLE INFORMATION ON ENERGY IN THE UNITED STATES

TO THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS UNITED STATES SENATE

DECEMBER 31, 1962

87th Congress
2d Session

COMMITTEE PRINT

REPORT

OF THE

NATIONAL FUELS AND ENERGY STUDY GROUP

ON

AN ASSESSMENT OF AVAILABLE INFORMATION ON ENERGY IN THE UNITED STATES

TO THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS UNITED STATES SENATE

SEPTEMBER 21, 1962

Printed for the use of the Committee on Interior and Insular Affairs

U.S. GOVERNMENT PRINTING OFFICE
87439 WASHINGTON : 1962

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

CLINTON P. ANDERSON, New Mexico, *Chairman*

HENRY M. JACKSON, Washington
ALAN BIBLE, Nevada
JOHN A. CARROLL, Colorado
FRANK CHURCH, Idaho
ERNEST GRUENING, Alaska
FRANK E. MOSS, Utah
OREN E. LONG, Hawaii
QUENTIN N. BURDICK, North Dakota
LEE METCALF, Montana
J. J. HICKEY, Wyoming

THOMAS H. KUCHEL, California
GORDON ALLOTT, Colorado
JACK R. MILLER, Iowa
JAMES B. PEARSON, Kansas
JOE H. BOTTUM, South Dakota
LEN B. JORDAN, Idaho

JERRY T. VERKLER, *Chief Clerk*
STEWART FRENCH, *Chief Counsel*

EX OFFICIO MEMBERS

CLAIR ENGLE, California
JENNINGS RANDOLPH, West Virginia

NORRIS COTTON, New Hampshire

CHAIRMAN ANDERSON'S MEMORANDUM OF TRANSMITTAL

SEPTEMBER 21, 1962.

To the Senate Committee on Interior and Insular Affairs:

I am transmitting herewith to the members of the Senate Committee on Interior and Insular Affairs and the ex officio members of the fuels policy study, as well as to other interested parties a staff report prepared for the committee as an assessment of available information on energy and fuels in the United States.

This study was initiated and conducted under authority of Senate Resolution 105 of the 87th Congress, 1st session. The study report was prepared by a special study group of experts recruited by the committee specifically for this task. The chairman of the study group is Mr. Samuel G. Lasky, an official in the Department of the Interior, and the members of the group are made up of professional men from private industry who were selected after conferences with and recommendations by spokesmen for our fuels industries.

I want to commend these gentlemen individually and as a group for their cooperation during the conduct of the study. As a result of their diligent efforts, in less than a year our committee has before it in a single volume pertinent information relating to fuels and energy essential to any further consideration we make of this important subject. I am particularly grateful to the chairman of the study group who was of great assistance to the committee in helping to meet promptly the deadline set for the study group's report.

In my view, our committee has been charged by the Senate with two main tasks under the authorizing resolution. The first was to gather the facts and figures pertaining to fuels and energy. This has been done in the present study. Our second and final task will be to study the information provided and, if it is the wish of the committee, to report our policy findings and recommendations to the Senate.

To help the committee with this task, we are distributing this study and inviting comments and suggestions which, when received, will be carefully considered in reaching any decisions respecting recommendations for congressional action. When the Interior and Insular Affairs Committee meets early in the 88th Congress, our assignment can be then completed.

I am convinced that the study group has made a real contribution to this Nation's store of knowledge on a complex and all-important subject, and that its report will prove of great value to the Government, to our fuels industries, and to the public.

CLINTON P. ANDERSON,
Chairman, Senate Committee on Interior and Insular Affairs.

REPORT

OF THE

NATIONAL FUELS AND ENERGY STUDY GROUP

ON

AN ASSESSMENT OF AVAILABLE INFORMATION ON ENERGY IN THE UNITED STATES

SAMUEL G. LASKY, Department of the Interior, *Chairman*
HERBERT J. BICKEL, Texas Eastern Transmission Corp.
JOSEPH J. QUINN, Rochester & Pittsburgh Coal Co.
JOHN M. RYAN, Humble Oil & Refining Co.
PAUL R. SCHULTZ, Jr., *Consultant*

LETTER OF SUBMITTAL

U.S. SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
September 7, 1962.

Hon. CLINTON P. ANDERSON,
Chairman, Committee on Interior and Insular Affairs,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: We are honored to present herewith to the Senate Committee on Interior and Insular Affairs our assessment of the available information on energy in the United States. The report is the result of roughly 10 months of effort; although work was started as early as August 1961, the study group was not fully assembled until November. More information could be included, and the analysis made a little more penetrating, here and there, but the broad conclusions to be derived would remain unchanged and we do not think the additional time and effort would be justified.

The report presents first a brief historical and economic perspective, examines current opinion about future consumption of energy, considers one by one the various determinates of supply (reserves, plant capacity, transportation, labor supply and productivity, technology, marketing, competition, and like influences), and then compares the estimated future consumption with the Nation's ability to supply it. The years 1965 and 1980 were selected as check points. Emergency as well as peacetime demand and supply are covered. A subsequent chapter discusses the economic and social costs of various policy directions, and the last chapter of all presents the opinions of industry and consumer groups as to what they think national fuels and energy policy should be, in their own words.

Your instructions regarding the making of this study are presented in the introduction to the report. In brief, the instructions were to assemble the information that is currently available, to study it, and to assess its worth. In doing so we found ourselves continuously dismayed to learn how little positive information exists, how much is impression and folklore, in subject area after subject area, in industry after industry. Belief in this folklore is deep and it is held with passionate, though honest, tenacity. Too often, to our minds, have we been forced to write: "No one knows * * *." One result of this set of circumstances is that our report contains occasional statements that do not have the complete endorsement of one or another of the members of the study group. All this we have tried to record faithfully and objectively. Yet despite the imperfect fabric of fact, we think there has emerged from this study a reasonably good picture of energy in the United States and of the policy, legal, and regulatory framework within which it sets. It is our earnest hope and belief that we have given you and your committee the information you want.

Through you we want to acknowledge the generous and expert cooperation provided us by many Government agencies, trade associations, companies, and individuals in providing us with information and in checking our draft report. The credit for whatever value this report may have must be shared with them.

Respectfully submitted.

NATIONAL FUELS AND ENERGY STUDY GROUP,
SAMUEL G. LASKY, *Chairman.*

CONTENTS

	Page
Chairman Anderson's memorandum of transmittal	III
Letter of submittal	3
Summary	11
Introduction	11
The scope of this report	17
Its purpose	17
The approach	18
How far into the future?	18
Part I. Energy in the economy	20
Use patterns	20
Expenditures	23
Part II. Requirements for energy	26
Factors influencing energy requirements	26
Peacetime forecasts	33
Emergency requirements	41
Nuclear war	41
General war without nuclear attack	43
Limited (Korea-type) war	44
Mobilization short of war	45
Energy as a "free good"	46
The regional problem	48
Part III. Supply	61
The resource base	61
Domestic	61
Crude oil and natural gas liquids	62
Natural gas	71
Gas in coal seams	79
Coal	79
Fissionable materials	83
Oil shale and tar sands	85
Peat	85
Hydropower	86
Foreign	86
Canada	86
Mexico	94
Venezuela	94
Remainder of the world	97
Plant capacity	99
Domestic	99
Bituminous coal	99
Anthracite	101
Petroleum and natural gas production	104
Crude oil and refined product pipelines	114
Oil shale	117
Electric generation	118
Fissionable material	118
Foreign	119
Petroleum and natural gas production	119
Refining	122
Pipelines	126
Labor	129
Coal	129
Oil, gas, and electric utilities	132
Nuclear energy	133
Productivity	133
Coal	134
Oil and gas	137

Part III. Supply—Continued Page
Transportation 139
Peacetime 139
Railroads—coal 139
Railroads—oil 150
Water transportation 152
Highways 156
Pipelines—gas 157
Pipelines—oil 163
Pipelines—coal 164
Electricity 165
Conclusions 169
Emergency 170
Coal 170
Oil 172
Gas 173
Electricity 173
Nuclear (radioactive) materials 174
Technology 176
Coal 176
Oil and gas 182
Oil shale and tar sands 189
Transportation 191
Electric generation 196
Electric power transmission 198
Nuclear 202
Corporate concentration 207
Coal 207
Oil 208
Gas 208
Electric generation 208
Conclusions 211
Marketing and pricing patterns 211
Coal 211
Crude oil 218
Petroleum products 221
Natural gas 225
Gas transmission and distribution 227
Marketing 227
Pricing 233
Electric utilities 238
Foreign trade 241
Oil 241
Natural gas 241
Coal 249
Electric energy 251
Fissionable material 251
Costs 252
Coal 252
Oil and gas production 256
Gas transmission and distribution 265
Electric energy 270
Part IV. Interfuel competition 274
Introduction 274
Historical perspective 274
Influencing factors 277
Individual markets 285
Residential and commercial 285
Industrial 289
Transportation 294

Page

Part V. Unconventional sources of energy 295
Part VI. Comparison between requirements and supply 299
Coal 299
Oil 301
Gas 304
Electric energy 305
Emergency 306
Part VII. Policies, laws, and regulations 310
Federal legislation 310
Foreign trade 310
Production of energy materials 313
Electric power generation 314
Government owned or sponsored 315
Investor-owned utilities—Federal Power Commission 317
Natural gas 317
Transportation 318
Other than gas pipelines 318
The right of eminent domain—pipeline right-of-way 319
Research 320
Minimum price fixing for coal 321
Taxation on production 321
Highway user taxes 322
Maritime laws 322
Foreign policy 322
State and local regulations 323
Conservation of oil and gas 323
Taxation on mineral production 324
Highway user taxes 325
Utility regulation 325
Air pollution 327
Policies of foreign governments 328
Part VIII. Policy issues 331
Interruptible gas 332
Crude oil and petroleum products other than residual fuel oil 338
Residual fuel oil 341
Gas from Canada 345
Oil shale and tar sands 345
Research 351
Self-sufficiency 352
Hemisphere emergency supply 354
Controlled end use 354
Electric transmission interties 357
Coal mining unemployment 359
Pipeline right-of-way 362
Relation to other policy areas 365
Transportation 365
Taxation 366
Trade policy 367
International policy 367
Federal programs 368
Part IX. Industry and consumer points of view 370
American Gas Association 370
American Petroleum Institute 382
American Public Power Association 388
Anthracite Institute 396
Association of American Railroads 399
Edison Electric Institute 402
Independent Natural Gas Association of America 403
Independent Petroleum Association of America 405
National Coal Policy Conference and the National Coal Association 425
The New England Council 437
Statistical and similar references consulted 479
Index 485

LIST OF ILLUSTRATIONS

Figure:		Page
1.	Energy sources as a percent of energy consumption	21
2.	Real national output and energy consumption	29
3.	Real national income and energy consumption per capita	30
4.	Net flow of electric energy between regions	51
5.	Net flow of coal between regions	52
6.	Net flow of oil and natural gas liquids between regions	53
7.	Net flow of natural gas between regions	54
8.	Net imports and exports of energy in the United States by regions	58
9.	Petroleum reserves, annual production, and ratio of reserves to annual production	63
10.	Oil added to proved reserves through revisions and extensions	67
11.	Oil and gas fields of the United States	69
12.	Natural gas reserves, annual production, and ratio of reserves to annual production	73
13.	Natural gas added to proved reserves through revisions and extensions	75
14.	Recoverable natural gas added to proved reserves annually through discovery of new reservoirs	75
15.	Estimates of gas remaining to be discovered	77
16.	Coal fields of the United States	81
17.	Major commercial peat operations in the United States	87
18.	Canadian oil reserves, annual production, and ratio of reserves to annual production	89
19.	Oil added to Canadian proved reserves through revisions and extensions	90
20.	Canadian gas reserves, annual production, and ratio of reserves to annual production	91
21.	Natural gas added to Canadian reserves through revisions, extensions, and discoveries	92
22.	Mexican petroleum reserves, annual production, and ratio of reserves to annual production	95
23.	Mexican gas reserves, annual production, and ratio of reserves to annual production	96
24.	Historical record of coal production	100
25.	Oil and gas wells drilled and exploration crews at work	106
26.	Production of crude oil in the United States	107
27.	Crude oil production compared with capacity	107
28.	Refinery capacity and crude oil runs to stills	111
29.	Regional distribution of refinery capacity	112
30.	Refinery yields of gasoline, distillate, and residual fuel oil	113
31.	Capacity of crude oil and products pipelines	115
32.	Canadian crude oil capacity and annual production	120
33.	Refinery capacity and runs to stills in the Western Hemisphere	123
34.	Refinery yields of heavy fuel oil outside the United States	124
35.	Refinery capacity and runs to stills in the Eastern Hemisphere	125
36.	Men employed in coal mining in the United States	130
37.	Average tons per man-day in U.S. coal mines	136
38.	Productivity in the coal, petroleum, refining, and natural gas industries	138
39.	Railroad shipments of bituminous coal, and coal-traffic revenue	140
40.	Eastbound freight-rate groups for bituminous coal	142
41.	Northbound freight-rate groups for bituminous coal	144
42.	Westbound freight-rate groups for bituminous coal	145
43.	Coal transportation charges	146
44.	Fuel-oil transportation charges	146
45.	Map showing the major coal-carrying railroads	147
46.	Petroleum freight originating with class I railroads	151
47.	River transportation of bituminous coal	151
48.	Water transportation of coal	153
49.	Marketed gas in interstate commerce	158
50.	Major natural gas pipelines in the United States	facing 159
51.	Crude-oil pipelines and underground storage areas	facing 163
52.	Major products pipelines	facing 163
53.	Electric transmission groups and power pools	167

Figure—Continued Page

54. Interconnected investor-owned electric transmission lines as planned by 1970 ..... facing 167
55. The "pushbutton" miner 179
56. Projected output per man-day in bituminous coal mining 180
57. Coal needed to produce a ton of steel 183
58. Money spent on oil and gas research and development 184
59. Pounds of coal needed per kilowatt-hour 197
60. Relation between transmission mileage and voltage 198
61. Relation among length of transmission line, voltage, and load 200
62. Increase in electric transmission voltage since 1920 201
63. Investment cost for electric transmission lines and terminal equipment 201
64. Corporate concentration in American energy industries 209
65. Concentration of coal production by mines 210
66. Bituminous coal sold to electric utilities, by regions 213
67. Bituminous coal sold through retail dealers, by regions 214
68. Bituminous coal sold to coke and gas plants, by regions 215
69. Bituminous coal sold to miscellaneous users, by regions 216
70. Posted prices for typical grades of crude oil 220
71. Major refinery complexes 222
72. Daily sale pattern of gas distribution 229
73. Residential and commercial sale of gas, by regions 232
74. Sales of interruptible gas, by regions 234
75. Industrial sales of gas, by regions 235
76. Gas used for power generation, by regions 236
77. Block ratemaking for gas sales 239
78. Residual fuel oil consumption, supply, imports, and refinery yield 244
79. Penetration of residual fuel oil into eastern U.S. markets 246
80. Exports of coal from the United States 250
81. Tonnages of coal sold at various prices 254
82. Prices of drilling materials and services 257
83. Average depth of oil and gas wells 258
84. Footage of oil and gas wells 260
85. Cost of developing liquid and gaseous reserves, in B.t.u.'s 261
86. Wellhead price of crude oil 263
87. Average realization on petroleum liquids and natural gas 264
88. Gas-industry costs and cost of gas to the consumer 269
89. Cost of electric transmission lines 271
90. Competitive consumption of primary energy 275
91. Consumption of bituminous coal by consumer class 286
92. Retail prices of fuel 287
93. Price of heating fuel in Boston 288
94. Coal, oil, and gas in the electric generation market, by regions 290
95. Coal, oil, and gas in the "coal competitive area" 291
96. Fuel prices paid by Consolidated Edison Co 293

REPORT OF THE NATIONAL FUELS AND ENERGY STUDY GROUP

SUMMARY

The basic purpose of this report is to compile and assess an existing body of information, and hence the report does not readily lend itself to being summarized in the usual sense. Nevertheless, we have tried here to condense the information and to indicate its drift in such a way as to give the reader a useful guide, so that he may be able to select such part of the contents as he wishes for detailed reading.

REQUIREMENTS

There is a reasonable consensus among the experts that the Nation's projected requirements will nearly double by 1980 (to about 82 quadrillion B.t.u.'s), that generation of electric energy will multiply by some 3½ times (to about 2,700 billion kilowatt-hours), and that consumption of oil will increase by about two-thirds (to, say, 5.7 billion barrels). The consensus for coal, gas, and nuclear energy is not so clear cut, but the following deductions have been accepted as usable for the policy-tailored framework of this report: coal consumption roughly to double by 1980 (to 800 million tons or more), gas almost to double (to 20 trillion cubic feet or more), hydropower generation to drop from a share equal to 4 percent of total energy consumption to about 2½ percent, and nuclear energy to increase to a level about equal to hydropower.

Quantitative estimates of emergency requirements—a euphemism for wartime requirements—are meaningful only in relation to a near-future contingency. For this and other reasons, we assume that the nonmilitary part of wartime requirements will be within the margin of error inherent in the peacetime figures projected for 1965: i.e., 11 million barrels of oil a day, 15 trillion cubic feet of gas a year, 500 million tons of coal a year, and 1,100 billion kilowatt-hours a year. For oil there would be an additional military demand approaching 3 million barrels a day.

These figures do not apply to nuclear war, of course. In the period immediately following an attack, the civilian population would have to get along with such quantities and kinds of fuels as are at hand locally. We presume that the military arm has petroleum fuels in hand to support the immediate retaliatory blow. The demand for petroleum products would increase as military action mounts, and the demand for all forms of energy would increase as national authority is restored and industrial activity is resumed. The top limit of this increase is conditioned by how long the war would last and the course it takes. All energy demands would remain high during the period of reconstruction.

SUPPLY

The Nation's resource base, in terms of each fuel, is adequate to meet projected requirements for the period covered by this study—i.e., to 1980. The 20 billion tons of coal even now commercially available (reserves) is more than enough comfortably to support a 1980 coal output of even as much as 800 million tons. There is plenty of oil in the ground but one or more steps may be needed to realize it: rate of exploration be stepped up, more attention be given to secondary recovery, ratio of reserves to rate of output be established at some figure well below the usual range of 12 to 14. The Nation has the ability to be self-sufficient in oil if it so wills. Imports could be called on if desired, there being no dearth of foreign oil, and so could the oil in oil shale. Oil shale may in fact actually be yielding oil well before 1980, and coal may be yielding gasoline. The domestic supply of gas available appears to be safely well above the projected requirement. High B.t.u. gas from coal is in the near offing. A comparison between projected consumption of electric energy (regardless of source) and the ability to supply it yields the prompt and simple answer that there should be no difficulties in that area. While nuclear power faces several problems, it is an accomplished technological fact.

Conventional fossil fuels plus shale oil and fissionable materials contain recoverable energy equivalent to 800 years of usage at the current rate. Improvement in nuclear technology could expand this figure eightfold. This outlook is without the benefit of foreign supplies, fissionable materials available at prices higher than those now paid, coal and shale oil beyond the limited quantities assumed to be recoverable, or the energy potential of unconventional sources.

There is also a large present plant capacity and apparently an industrial ability to generate the funds to expand the capacity as needed. Labor supply should pose no problems; the only sector about which doubt has been expressed is in regard to coal miners; and here it appears that, because of expected continued improvement in output per man-day, the 800 million tons of 1980 conceivably could be produced by a labor force even smaller than the force presently at work.

Transportation has sometimes been considered a bottleneck in the energy complex. The concern appears exaggerated. Transportation of oil and gas is a matter of investment. An aggressive research on extra-high voltage transmission almost assures continued economic transportation of electric power. The only real question relates to a shortage of railroad cars for the movement of coal. Such shortages as occur are not the result of a shortage of cars as such but of cars that are serviceable. The railroads repair damaged cars only as traffic demands it, and a shortage results when business picks up faster than ability to repair the cars. Whether or not shortages have ever limited the total supply of coal to the country, or have caused coal users to turn to other fuels, is a matter of conflicting opinion.

In a nuclear emergency, the Nation will have to rely initially, as indicated above, on the supply locally available, but there would be such great destruction of consuming equipment and plants that the supply would be generally adequate. Further supply should be available as quickly as it is called for by restoration of the economy. For other war or war-related emergency, the national capacity for producing

oil products seems to come close to equaling, or even exceeding, total wartime demand. This is without regard to imports, but so much judgment is involved, and the problems of wartime requirements and logistics are so complicated, that the subject needs deeper analysis than we can give it. Both coal-producing capacity and labor supply are large enough to meet emergency coal demand. Gas-producing capacity and electric-generating capacity are adequate. Information on wartime transportation capability regarding energy is scanty and conflicting, but seemingly there would be no dire problems within the United States itself. Ocean transportation encompasses military problems outside our purview.

COST AND TECHNOLOGIC PROGRESS

Implicit in the above commentary about the Nation's ability to meet its needs over the next 20 years is an assumption about the ability of continued technologic progress to hold costs within limits. In part this is a matter of faith, albeit faith based on the record. How much oil, gas, and coal will be produced, and how much electricity generated, are matters of economic decision, which resolve into incentives for exploration, research, and development and for investment in plant to transport what is produced or generated. Incentives are related to ultimate profits, which are related to costs. Information on costs is elusive and inconclusive, but at least for oil and gas jointly there seems to be little discernible trend either upward or downward in real terms (dollars of constant value). None of the three principal fossil fuels seems likely to price itself out of any major markets within the time span of this report. In any case the cost of oil from shale should place an upper limit on the price of crude oil, and the cost of gasifying coal a limit on the price of natural gas; all these will impose restraints on the price of coal.

The cost of transportation is a vital part of the delivered price of energy. The coal pipeline, the integral train, mine-mouth generation coupled with extra-high-voltage transmission, larger diameter oil and gas pipelines, and other developments should hold transportation costs down.

INTERFUEL COMPETITION

Use of coal has been going down in the face of an increasing national consumption of energy. The three fuels—coal, oil, and gas—compete with one another for the electric energy, space-heating, and process-heat markets; electric energy (including hydropower) competes with coal, oil, and gas for parts of these same markets.

Competition results from the ability and willingness of the customer to shift from one product or supplier to another. Many factors influence this freedom of choice. One is the physical character of the fuels. The solid nature of coal and the liquid nature of oil generate advantages and disadvantages for each, both with respect to cost in their competition with one another and with gas and with respect to esthetic preference.

A second factor is adequacy and assurance of supply, and a third is the delivered price. Delivered price is related to transportation. Cost of transportation is the reason why interfuel competition is so

severe in those areas having little or no native energy resources, as in New England particularly. Railroad transportation of coal comes high, compared to the cost of moving oil or gas, constituting on average throughout the United States more than four-tenths of the delivered price of bituminous coal.

All the major fuels, including coal, are produced and transported as though jointly with coproducts or byproducts. Electricity, too, is sometimes a joint product, and transportation also has its joint-product aspects. The economics of joint products influences the pricing of the main product.

One aspect of the influence of technology has been referred to above. Of more immediate relevance to competition is the technology of use, which has acted particularly to the detriment of coal. Prime examples are the change from steam to diesel railroad locomotives and the substitution of oil and gas for coal in home heating.

Fuel competition is related also to the propinquity of fuel source to market, which is a shifting circumstance, and of course to the common phenomenon of consumer preference.

A final factor is the framework of policies, laws, and regulations within which the competition operates, summarized separately below.

POLICIES, LAWS, AND REGULATIONS

Federal, State, and municipal governments all have laws and regulations relating to energy. The Federal Government leaves local energy problems to local regulation. In addition, the policies of foreign governments have their impact on American supply and demand.

Federal legislation and policy in the field of energy covers foreign trade, production of raw materials, electric power generation, production and sale of natural gas, transportation, research, taxation on production and use, maritime laws, and foreign relations. State and local regulations apply mainly to conservation of oil and gas and cover also taxation on mineral production and use, public utility regulation, and air pollution.

Policies of foreign governments relate to their control over the importation of American coal and to their reaction to U.S. restrictions on importation of oil and oil products. Canadian policy occupies a special niche, because of the contiguity of the two countries. The U.S. imports both gas and electricity from Canada, which imposes restrictions on the outflow of both.

Some policies, laws, or regulations tend to limit production and to raise price, some to lower price; some specifically restrict end use.

POLICY ISSUES

Twelve policy issues have been identified as justifying discussion. These include the sale of natural gas to industrial consumers under interruptible rate schedules, importation of residual fuel oil, importation of crude oil and products other than residual fuel oil, importation of natural gas from Canada, development of a domestic shale industry, the role of Government-sponsored research, domestic self-sufficiency, whether action is necessary to insure that U.S. emergency needs can be met from the Western Hemisphere alone, legislative or regulatory control of the use to which a fuel may be put, Government

encouragement of electric transmission interties, how to handle the problem of unemployed coal miners, and granting of right of eminent domain to coal pipelines.

Whatever policy direction may be followed with respect to each of these, various costs and gains are involved—to the Treasury, to the consumer, to the gaining and losing industries, and to society. Some of these gains can be quantified, mostly they cannot. In fact, it is not possible always to isolate them, or to trace out the specific effect of a policy action. Action taken may better one situation, worsen another. Questions that cannot be answered insist on intruding, such as: What is the cost to society when in the pursuit of some goal a desired product or service is denied? Or, what is the cost of withholding the fruits of technologic innovation or of dampening investment?

Energy policy relates to other policies, either explicitly or indirectly, and some energy policies indirectly affect policy in other areas. The important involvements are with transportation, taxation, trade policy, international policy other than trade, national defense, and various Federal programs, particularly atomic energy. Other areas of policy involvement include antitrust legislation, care and development of the inland waterways, space exploration, air pollution, labor, and urban redevelopment.

The three policy issues that are currently of most intense interest are:

Interruptible gas

In 1960 total interruptible sales totaled 2.1 billion Mc.f. Most of this is sold in geographic areas not economically served by coal, and some is sold for noncompetitive uses. In all, about one-fourth (or the equivalent of 22 million tons) is in direct competition with coal.

The price charged for interruptible gas is less than that charged for firm service and at least covers the cost of the gas itself plus the out-of-pocket costs of transportation and distribution. Thus this type of service makes a contribution toward fixed charges that would otherwise be borne by firm customers. In 1960 this fixed-charge contribution aggregated $400 million nationally.

Residual fuel oil

The use of residual fuel oil in the United States has remained fairly uniform over the past decade, but on the east coast, where most of it is consumed, net imports for domestic consumption have been rising and in 1960 were the equivalent of about 40 million tons of coal. Such imports come largely from the Caribbean where heavy fuel oil is the major refinery product. These imports affect the production of coal primarily in Pennsylvania, Virginia, and West Virginia.

Coal mine unemployment

The number of workers engaged in coal mining has been declining almost steadily from a peak of about 875,000 reached in the early 1920's. It is now only about 150,000. The number of unemployed is estimated at 100,000.

About half the decline has resulted from loss of markets and half from improvement in the efficiency of production. For bituminous coal the fractions are about one-third due to loss of market and two-

thirds to improved efficiency. The average miner produced 2,450 tons in 1960, as against 1,350 tons a year during the midforties when coal output reached its peak, and about 750 tons a year in the early twenties when employment reached its peak. Concurrent with loss of markets, coal-mining wages were rising and were among the highest in American industry, and this element of cost has been a major factor in pushing the industry into mechanization during the postwar period, in order to stay competitive.

Elimination of interruptible gas sales and of the importation of heavy fuel oil would increase employment in the coal industry, but for a number of reasons (among them that part of the vacated markets would be taken by domestic oil and by firm gas and that the current coal work force is used less than full time) the gain would be small—perhaps a few thousand men—in terms of the gross problem. Each million tons of added coal production would represent the employment of 400 miners at today's average output per man-day and at the average current workweek of less than 4 full days; at the current workweek but at the output per man-day projected for 1965, each million tons would represent the employment of 285 miners.

INDUSTRY AND CONSUMER POINTS OF VIEW

The point of view held by producers and consumers of energy as to what policy should be is as much a piece of information as is a table of statistics or description of a piece of technology. In order to provide as full a body of information as possible, we have invited the points of view of 12 groups, each representing either a producer of one or another form of energy or a consumer. These are included precisely as received. It would be a disservice to these groups to summarize their statements, for interpretation unavoidably would insinuate itself, and therefore we have not done so.

INTRODUCTION

The scope of this report

Senate Resolution 105 (87th Cong.) instructs the Senate Committee on Interior and Insular Affairs to undertake a study of the supply of and demand for fuels and energy in the United States. The study is intended as a basis for possible revision of fuels and energy policy, including the possibility of new legislation. The inquiry has three parts: (1) a study of the present and future energy requirements of the Nation and of its ability to meet those requirements; (2) a review of existing laws and policies with respect to their effect upon energy supply and demand; and (3) consideration of policy.

The first two parts are factfinding operations and constitute the subject of this report. The instructions given to the authors of it by the Senate Committee on Interior and Insular Affairs were simple and clear, as follows:

1. To prepare for the committee, within the objective of Senate Resolution 105, as accurate a story as possible, in simple and nontechnical language, about the economic and technical aspects of energy demand and supply in the United States.

2. In doing so, to deal with existing information only or such new information as can be assembled in short order.

. . . And its purpose

The first instruction constitutes a direction to sift out the fact from the nonfact in the existing body of information—to scrub the facts clean, so to speak. There are many persons who will say that the facts are clean enough as they are. That may be, as those persons see the facts. But Congress is not composed of experts in the demand and supply of coal, or oil, or gas; in the intricacies of electric generation, transmission, and use; in the potentials of atomic energy; in the possibility of needing and getting energy from the sun, or wind, or the tides, or of using heat brought up from deep in the earth.

What purports to be fact is not always indeed fact. The only bits of information that everyone can agree on are the bald statistics themselves and even that circumstance does not always hold. Often the so-called fact represents judgment, impression, informed guess, overstatement, prejudice, or sometimes plain fiction. Professional judgment and impression are invaluable when facts are short, but they are not a substitute for fact itself.

The element of prejudice must be particularly suspect. In relation to this study, there are two kinds: the honest prejudice generated by a person's loyalty to his profession or his firm, and the biases inherent in professional theory. There are various schools of thought on how to calculate mineral reserves, for example. Those who estimate reserves of coal, oil, and gas each believe that the occurrence and economics of his commodity are unique and demand unique definitions and criteria. A figure on reserves is thus not an immutable fact, but,

in the first place, involves considerable judgment and, in the second place, is conditioned by the business economics of the industry.

A second example is in the methodology of making projections. There are two major schools of thought on how projections are to be made, and each contains subschools. The adherents of each school are honestly convinced about the correctness of their methods, but however positive they may be, the figures they come up with are not fact. Considering the wide ranges in projections of future use of energy, for example, made by different experts, the figures certainly are not the kind of "fact" upon which Congress should properly be asked to anchor anything so serious and far reaching as national policy.

The first intent of this report, then, is to assemble the facts as meticulously as possible. Where facts run short and judgment must be used, the report points out where the judgment enters; where informed guesswork must be resorted to—and it is resorted to only where necessary—that is clearly flagged for the reader's attention. Where the facts are too scanty for even that, the reader is informed of that, too.

Volumes of information are available. If stacked one on top of another, the statistical compilations, analyses, and reports relevant to the present study would make a pile many feet tall. A list of those that have come to our attention appears as an appendix to this report. The amount of information of one kind or another is so impressive as to appear to obviate the need for time-consuming and costly new studies. Part of the purpose of this report is to find out if that is true—to find out if it is necessary too often to resort to guesswork in clarifying the economic and technologic basis of policy consideration.

The approach

The method used herein in approaching the purposes stated above is to analyze the energy needs of the United States and then to measure against them the supply of energy that can be made available. At the same time and within this framework, and in order to keep the study oriented toward its main purpose as an aid to policy consideration, the report keeps its eye on the gathering and analysis of information specifically needed to clarify the policy issues brought to the attention of Congress during the hearings on Senate Resolution 105.

Preparation of the report has exposed an assortment of additional policy issues. These are indicated. Indicated also are alternative approaches to these issues, an assessment of the costs of each alternative, and the extent, if any, that the various alternatives may violate the technologic and economic situation, in order that Congress may know of them in considering the political and social factors that it must deal with in policy determination.

How far into the future?

Senate Resolution 105 specifically refers to "prospective fuel and energy resources of the United States—and probable future rates of consumption thereof." How far into the future should one attempt to peer? The authors of this report have concluded that 20 years is a good compromise between impulse and reality. It is far enough

into the future to offer perspective for policymaking, yet is not so distant as to preclude reasonable assessment of future demand and satisfactory judgment as to the trends of the technology and economics of production. We can judge within reasonable limits, for example, what may be the technology of the production of coal, oil, and gas by 1980, and what may be the effects of this technology on costs of production, whereas anything beyond that date gets deeper and deeper into unnecessary speculation. At the same time, 20 years is distant enough to permit necessary adjustments in policy if such adjustments become necessary.

The year 1980, then, is taken as the terminal checkpoint for this report. The reader is cautioned to remember, however, that "1980" does not mean that specific year, but, rather, the general period of time clustered around it. The crystal ball available to authors of this report is not clear enough for them to predict what may happen in any given year. A glance at economic ups and downs exposed in any historical record prove how impossible that is. The reader may consider this to be an unnecessary caveat, yet experience proves that projections and the analyses made from them almost invariably run afoul of the public's inclination to hold the forecaster to the specific year.

Assuming that the study called for by Senate Resolution 105 leads to new legislation, it will, perforce, be a while before the legislation takes effect. This factfinding report must be studied, its information married to other considerations, and legislation studied, written, and debated. The new legislation and policy will apply to conditions as they then exist; 1960, the latest year for which statistics were available in preparing this report, and 1961 and 1962 the years in which the study was made and the report written, will be history. Accordingly, the authors have striven to project economic and technological conditions to, say, 1964 or 1965 as a base year.

PART I. ENERGY IN THE ECONOMY

USE PATTERNS

The ways in which energy is used at any given time are a function of the technology of use, the competitive ability of producers of the raw energy (including electricity) to deliver the energy to the consumer, availability of the raw forms, and preference of the consumer.

At any one time, one or another of these several factors dominate, at a different time another dominates. When wood was at hand for the taking, it was used, and the technology of use was adapted to the characteristics of wood. But when coal deposits were discovered and developed, coal's capabilities so far outstripped those of wood that the use technology was modified to suit—and the modification induced additional development of coal production. The growth of iron and steel production and that of coal also went hand in hand, as did, later, petroleum and automotive transportation. Petroleum brought gas with it, but use had to wait for a technology of transportation to be developed. With gas, consumer preferences were and are particularly important. Concurrently, gas was found to have unique properties that make it peculiarly useful for some purposes. Figure 1 shows the historical development of relative usage.

TABLE 1.—*Fuel consumption by sector, 1955*

[Trillion B.t.u.]

	Coal	Oil and natural gas liquids	Natural gas	Total
Industry	5,012	2,722	4,081	11,815
Commercial	896	763	603	2,262
Households	938	2,549	2,239	5,726
Transportation	333	7,430	254	8,017
Government	(1)	821	293	1,114
Agriculture	(1)	616	(1)	616
Miscellaneous	(1)	1,794	1,654	2,848
Electric generation[2]	4,242	630	1,384	6,256
Total	11,422	17,325	9,908	38,635
Total, 1961	10,224	20,412	13,428	44,064

[1] Included in other categories.
[2] Hydropower not included.

NOTE. Totals do not add due to rounding.

Source: Schurr and Netschert with minor adjustments; 1961 Bureau of Mines.

Table 1 shows the pattern of use by consuming sector. Of this pattern, a fifth to a fourth of coal use is nonfuel (for coke), some uncertain but small use of gas (for carbon black and petrochemicals), and an eighth of oil use (petrochemicals, lubricants, wax, coke, road oil, asphalt).

Coal is preeminent in the generation of electricity and is assumed by students of the subject to continue preeminent for some time in

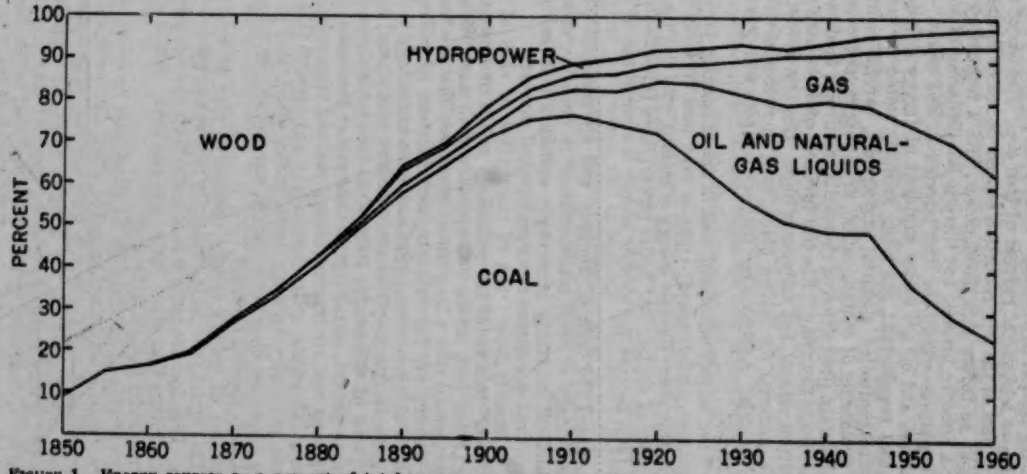


FIGURE 1. Energy sources as a percent of total energy consumption. (After Schurr and Netschert; 1960 figures based on Bureau of Mines data.)

this usage over the Nation as a whole. Coal is uniquely suitable, in the form of coke, as a chemical reducer of iron ore. The use of oil or natural gas in part of the iron-reduction process decreases the need for as much coke as before this development, and a technology is developing for a noncoke process, but there is no displacing of coke entirely for this purpose within the time purview of this report.

Coal, natural gas, and oil are major suppliers of energy in industrial processes that require heat, gas being uniquely suited for processes that require controlled chemical atmosphere, careful control of the heat, or avoidances of contamination, as in forging operations, heat treating of metals, production of chemicals and drugs, food processing, and glass manufacturing. Electric furnaces could be used for precise temperature control, but the cost is high. Gas also is ideally suited as a raw material for carbon black, used in rubber making, and for petrochemicals. And no other fuel can compete with gas for use in the field itself.

Oil and gas have largely displaced coal in space heating, largely because of consumer preference, and gas is even now limiting the growth of oil in this use. Electric energy is moving into this usage, but, except in areas of nuclear and hydro power, there is no displacement of fossil fuels because the electric energy is created out of one of them.

Oil has preempted the field of highway and air transportation, because the technology of such transportation is designed around liquid fuels, and oil currently is strongly entrenched in railroad transportation. Coal dominates the metallurgical market.

To attempt to specify how much of the market of each of the basic fuels is "safe," because of the technology of use or because of the properties of the fuel, would be impossible with any precision and in any event would take a long time. Some uses that are "safe" now may not remain so; for example, electrification of railroads could eliminate diesel locomotives. (See section on technology.) But the following gross fractions appear reasonable at present and up to the first checkpoint of this study, 1965: Coal—six-tenths (most of the electric utility market, metallurgical coke, use at the mines); oil five-tenths (highway and air transportation, railroad transportation for the present, lubricants, petrochemicals); gas—four-tenths or more (field use, petroleum refining, some carbon black and petrochemicals, uses requiring close temperature, atmosphere, or contamination control, some spacing heating).

About 35 percent of today's energy demand is free of interfuel competition. This figure represents essentially motive energy now met by liquid fuels. This does not mean that this market is noncompetitive within itself but rather that other fuels—gas and coal—cannot effectively penetrate it under today's technology.

At the other extreme of competition lie those uses in which coal, oil, and gas are immediately interchangeable, when dual or three-way equipment is maintained and the switch from one fuel to another can be accomplished immediately on the decision to do so. About 45 percent of the 802 utility stations reporting detailed information to the Federal Power Commission in 1960 were equipped to handle two or three fuels. In regions I, II-A, and III (as designated by this study), which constitute our "eastern seaboard," 27 electric utility

plants were equipped to burn only oil; 116 to burn only coal; 51 to burn oil and coal; 16 to burn coal and gas; 19, oil or gas; and 25 to burn all three. Thus, of the eastern seaboard's 256 steam electric plants about 45 percent burn more than 1 fuel, the same proportion as for the Nation. In the West, of the 56 utility steam plants in Texas 23 were equipped for oil and gas, the remainder for gas alone; in Oklahoma 13 out of 15 plants were equipped for more than one fuel; in California all 35 plants burn both oil and gas.

The percent of total energy market involved in this situation is impossible to quantify, however. Useful as this information is, it is deficient in that it does not indicate the extent of convertibility in terms of fuel use. For example, in an electric plant listed as being able to use more than one fuel, is the fuel-burning equipment capacity interchangeable? More important is the lack of information regarding nonutility plants, that is, other industrial plants, hospitals, schools, and apartment buildings. Some of these plants have dual equipment but there are no records of the number of installations or the quantity of fuel consumed.

In part of the energy market more than one fuel can technologically provide energy, but some added investment may be required.

As to the future, it is impossible to project economic conditions, consumer preferences, and technology with certainty, but it is certain that technology and taste will change as they have in the past and that these shifts will set up strong pressures for changes in conventional fuel-use patterns.

EXPENDITURES

The economy of the United States rests upon a small base of energy. National income originating in the energy industries is only about 4 percent of the total national income.

Consumers, manufacturers, and government spend but a small proportion of their incomes in the purchase of energy—household consumers about 5½ percent, manufacturers 1½ percent, and government possibly 3 percent. Despite the expanding use of energy these proportions have remained fairly constant.

By households

Household expenditures for energy may be classified as "internal" and "transportation." Internal energy is that used in day-to-day household operations within the physical confines of the home, in the form of gas, electricity, fuel oil, and coal. "Transportation" means private automobiles, and this need is met almost entirely by gasoline.

Surprisingly, however, while energy is so important in today's home, only a relatively small proportion of the consumer's income is devoted to that end. Consumer expenditures for such purposes have risen from $2.5 billion in 1930 to $11.4 billion in 1960, an increase of 360 percent (see table 2). While this represents a great many dollars, it nevertheless amounts to an actual decline in proportion of personal consumer income, from 3.3 percent in 1930 to 2.8 percent in 1960. This reduction is in face of the significant, indeed radical, changes and improvements that have come about in home energy usage over the past 30 years.

TABLE 2. *Expenditures for various forms of household energy*

[Dollars in billions]

Year	Personal income	Internal energy			Transportation, gasoline	Total consumer energy expenditures
		Electricity and gas	Other fuel	Total internal		
1929	$78.9	$1.2	$1.3	$2.5	$1.5	$4.0
1940	78.7	1.5	1.4	2.9	2.1	5.0
1950	227.6	3.1	3.2	6.3	[1]4.9	11.2
1960	402.2	5.0	3.4	11.4	[1]10.6	22.0

[1] Estimates by study group.

NOTE.—Totals may not add due to rounding.

Basic data from Department of Commerce.

Expenditures for electricity and gas alone have risen from $1.2 billion in 1930 to $8 billion in 1960; the percentage of income so represented, however, has risen only from 1.6 percent to 2 percent. These increases are largely due to more intensive usage of household utilities, the consumer having found more jobs for the utilities to do—to air condition, to incinerate, to dry clothes—but in part also because of the switch from coal to gas for house heating.

Expenditures for private automobile transportation in 1960 were about 2.6 percent of personal income, almost the same as the proportion spent for household energy. Spending on gasoline has risen sharply from $1.5 billion in 1930 to $10.6 billion in 1960, reflecting the added dependence of Americans on their family autos, although the portion of income devoted to this end has remained fairly level. Part of the increase is due to taxes and inflation.

All expenditures by the individual consumer, both for household use and for transportation, represented 5.4 percent of his income in 1960, as compared with 5.2 percent in 1930.

By manufacturers

In 1958 manufacturers spent slightly over $5 billion on purchased fuels and electric energy for heat and power, which is substantially less than was spent by households. Figures for earlier periods were $3.3 billion in 1947, $1.3 billion in 1939, and $1.8 billion in 1929. Fuel used for other than fuel purposes and for conversion to other energy forms are not included in these figures. (The years used here differ from those in the section on consumer use because of the availability of different statistical series.)

The Census of Manufacturers' reports show that manufacturing firms spent about 1.5 percent of their revenues in 1958 for fuel and electricity; in 1947 it was 1.9 percent. This proportion ranged from 3 percent to 5 percent in the process industries (chemicals, stone, clay, and glass, and primary metals) down to small fractions of a percent in printing, apparel, and other industries where major proportions of expenditures go to labor and materials.

By the Federal Government

The Federal Government is a substantial user of energy for heating, cooling, and lighting the buildings it occupies, to power its motor fleet, and in other areas. In fiscal 1961, the General Services Administration spent about $7 million for natural gas, oil, coal, and for steam

as such, and $16 million for electricity. The Post Office Department spent an additional $22 million. The General Services Administration, the Post Office Department, and other agencies also lease or rent buildings, the energy requirements for which, while for the use of the Government, get reflected in statistics on the private sector.

Data on purchases of gasoline are too spotty for meaningful summary. The Post Office Department itself spent $13 million for gasoline and motor oils. In 1960 the Federal Government owned more than 213,000 vehicles that used about 214 million gallons of fuel.

In the Government's construction program some of the work is by private concerns so that there, too, energy requirements are in part reflected by the private sector.

A second category of energy use by the Government relates to the Government's role as a supplier of electricity. The steamplants of the Tennessee Valley Authority in 1960 burned 18.6 million tons of coal for which it paid about $83 million, and the TVA operations as a whole supplied Federal agencies with electricity bearing a price tag of $110 million.

A third category of Government energy expenditures relates to the military and atomic energy programs. Military expenditures exceed $1 billion a year for petroleum and its products and $20 million a year for coal, but we have found no figures for outlays for gas and electricity. The Atomic Energy Commisison spent about $232 million for electricity in fiscal year 1961 and an additional but unknown amount for fossil fuels. It was the principal recipient of energy from the Tennessee Valley Authority.

It appears that about 9 percent of the Atomic Energy Commission's total expenditures in 1960, and 1 percent of the Post Office Department's expenditures, was for energy. The figure for the military program, which is less energy intensive than the AEC operation but much more energy intensive than the Post Office operations, would lie somewhere between.

Since the remainder of Government probably falls between the military and the Post Office in terms of intensity of energy use, one may judge that between 1 percent and, say, 3 percent of the Government's operating expenditures are spent for energy.

6. The ultimate grand total of recoverable gas may be in the neighborhood of, say, 1,250 trillion cubic feet. This amount is compounded as follows:

Recoverable from proved parts of known reservoirs: 260 trillion cubic feet.

Recoverable from extensions to present areas and from pools yet to be discovered: Potentially 1,000 trillion cubic feet.

7. How much gas will in fact be discovered and recovered is anybody's guess, depending in part on money invested. The above figures do, however, give some appreciation of future possibilities. Most of the United States is favorable for discovery.

GAS IN COAL SEAMS

Most coal seams contain methane of a quality—1,000 British thermal units a cubit foot—equivalent to natural gas. The gas is contained in the pores and cracks.

Methane is recovered commercially from coal seams in Belgium, Germany, and France, and a little has been recovered and used locally in our own Appalachian area. Gas has always constituted a problem in coal mining, of course, and the mechanization that has taken place in recent years has aggravated it. New faces of coal are exposed so rapidly that the quantity of gas seeping from the coal makes ventilation increasingly difficult and costly, and thought is being given to removing the gas before mining. The Bureau of Mines has experimented on methods of doing this.

A ton of coal (except for the parts above water level or near the surface, from which the gas has leaked out) may contain as much as 2,000 cubic feet of gas. Thus the Appalachian field, which contains some 300 billion tons of coal in place (155 billion tons recoverable; see section on "Coal Reserves"), may contain possibly 600 trillion cubic feet, or twice the current estimates of proved gas reserves. Most of the gas, however, is perhaps so pore-locked as to be released only when the coal is crushed. The imperfect information we have suggests that the average content recoverable without crushing may be no more than 200 cubic feet a ton. At that rate, the potentially usable methane contained as such in the coal seams of the Appalachian region would total 60 trillion cubic feet. For the entire United States the total would be, say, 350 trillion to 400 trillion cubic feet.

COAL

Estimates of the coal reserves of the United States—in the sense of the tonnage that can be mined under existing mining practices and economic conditions and constituting the basis of investment—have been nonexistent.

The U.S. Geological Survey has periodically reported on what it calls the "coal reserves of the United States," but the term is defined as meaning estimated quantities within stated limits of bed thickness and depth below the surface without direct economic connotation. The total figure is said to include the coal in beds 14 inches or more thick to depths 3,000 feet below the surface. The figure is obtained by first estimating the total amount of coal originally in the ground and then reducing this by production to date and by an estimate of

coal lost in mining, to yield an estimate of the coal still remaining. The remainder is divided by 2 to give a figure called "recoverable reserves," this ratio being based on an analysis of a wide variety of studies on individual mines, counties, States, and individual coal seams.

The 50 percent considered recoverable excludes coal left in restricted areas around oil and gas wells and under towns, railroads, roads, and streams, as well as coal left in pillars to support the overlying rock, in thin adjacent seams left unmined here and there, in local areas of complex geologic folding and faulting and thus too costly to mine, coal lost in cleaning, and a small amount of refuse waste. Actual recovery in individual mines has ranged from less than 40 percent to as much as 80 or 90 percent.

The Geological Survey's estimate of recoverable coal, as of January 1, 1960, totals 830 billion tons.[8] The distribution by regions is as follows:

	Millions of tons	Percent of total
Region I of this report, New England (see map)	Trivial	
Region II, Appalachian region	133, 940	16
Region III	90	
Region IV	130, 300	17
Region V, gulf coast	20, 680	2
Region VI (lignite and subbituminous)	347, 580	41
Region VII	83, 070	10
Region VIII, Pacific Southwest	Trivial	
Region IX, Pacific Northwest, including Alaska	79, 300	10

This figure on recoverable reserves has been, and is, quoted as being equivalent to 2,000 years of production at the current rate. The arithematic is faultless but the calculation has little meaning, first because current rates of output are ephemeral, and second, because there is no indication as to how much it would cost to get the coal produced.

Of more immediate importance is the amount of coal available to support immediate and near-term production—the composite national tonnage of coal held by individual producers upon which they have based, or are willing to base, commmercial operations. Of even more immediate concern is the part that has been prepared for mining, the part, that is, into which entries have been driven or equivalent work performed in accordance with a determined mining system and awaiting only introduction of labor and equipment for production to begin. Such information has to be known for each method of mining—strip mining, auger mining, underground mining.

The Department of the Interior[9] reported in 1960 that 20 billion tons would be available at 1958 prices and costs over the next 40 years. As indicated below, this estimate exposes a high degree of expert judgment, but still it does represent judgment alone and does not provide the kind of assured knowledge needed to assess the strengths and weaknesses of the coal industry, particularly its ability to meet a sustained emergency. The necessary information resides only in the files of industry, and the National Coal Policy Conference has circularized the independent coal producers in order to get it for this study.

[8] Averitt.
[9] Joint Committee on Atomic Energy, Robert McKinney, vol. 4, p. 1520.

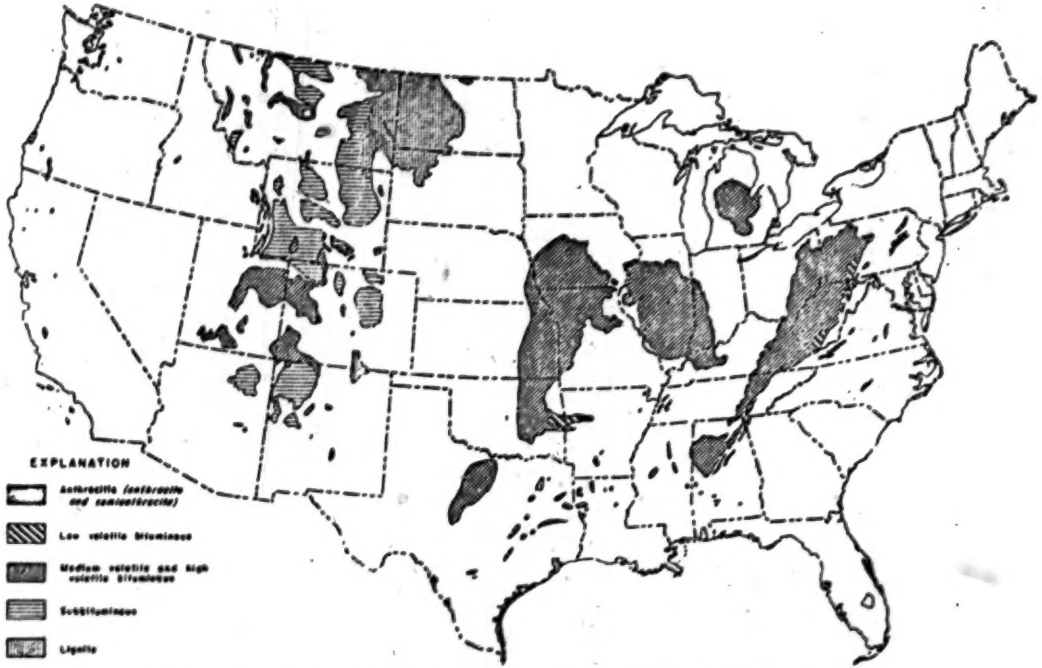


FIGURE 16.—Coal fields of the United States, exclusive of Alaska. Prepared by the Geological Survey, Department of the Interior

Response was received from producers representing, from district to district, 25 to 100 percent of annual output but excluding captive operations. Extrapolating the returns to 100 percent of coverage gives the estimates shown in the accompanying table, with grand totals of 20 billion tons at 1960 prices (of which 3.75 billion tons are strip and auger coal) and 35 billion tons at a price 25 cents a ton higher (of which 5 billion tons are strip and auger coal).

Estimated coal reserves of the United States, 1961

Region	Total reserves				Strip and auger reserves			
	At 1960 prices		At a price 25 cents a ton higher than in 1960		At 1960 prices		At a price 25 cents a ton higher than in 1960	
	Reserves (millions of tons)	Percent of total	Reserves (millions of tons)	Percent of total	Reserves (millions of tons)	Percent of total	Reserves (millions of tons)	Percent of total
II	14,000	70.3	27,000	82.4	2,100	56.0	3,400	68.3
IV	4,000	21.5	5,000	15.2	1,050	27.9	1,200	23.1
V	5	0	5	0	5	.1	5	.1
VI	500	2.7	600	1.8	500	13.2	500	9.8
VII	100	.5	200	.6	100	2.7	100	2.0
IX	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Total (rounded)	20,000	100	35,000	100	3,750	100	5,000	100

[1] Not reported.

We often hear the statement that the demands of World War II nearly exhausted the strippable reserves in the Appalachian region. The following table shows a breakdown of the strip and auger reserves in that region.

Reserves of strip and auger coal in the Appalachian region, 1961

	At 1960 prices		At 25 cents above 1960 prices	
	Million tons	Ratio of reserves to 1961 production	Million tons	Ratio of reserves to 1961 production
Pennsylvania, Maryland, northern West Virginia	100	4	300	11
Southern West Virginia, east Kentucky, Tennessee, Alabama	1,300	69	1,700	105
Ohio	200	8	1,100	44
Western Kentucky	300	17	300	17
Total and average	2,100	25	3,400	40

The 4-year and 11-year "life indexes" shown for Pennsylvania, Maryland, and northern West Virginia, which are the States whose strip and auger mines have been feeding fuel into the Eastern States, have no significance, however, as to whether reserves are running out or not. We have no past estimates of reserves against which to compare them in order to see if a short life index is a characteristic of that part of the coal industry or, if on the contrary, the index has been progressively decreasing as an indication of approaching ex-

haustion. We can be certain that continued improvement in coal mining technology and productivity (see chapter on "Technology") will have made most or all of the additional 200 million tons minable, at prices equivalent to those of the present, well before the 4-year quantity runs out, and will have made minable also several hundred million additional tons at a then moderate increase in price. At about 1965, then, reserves of surface coal in the northern Appalachian region, minable at 25 cents above the then price, should be some 500 million tons, with additional tonnages made available if improving technology can make possible the stripping of thicker overburden or deeper extraction with augers.

In any event, any possible exhaustion of strip reserves in the northern Appalachian region might be made up from nearby producing areas. The significance of strip reserves is not that they have any special quality, but (*a*) that in general they yield lower cost coal than underground reserves and (*b*) that output from surface mines can be expanded, in an emergency, faster than from underground mines.

FISSIONABLE MATERIALS

The Atomic Energy Commission has reported to the President that reserves of uranium in the United States in June 1962 were 175,000 tons of U_3O_8 minable at the price of $8 a pound. A "significant but undeterminable" additional tonnage would become available at $20 a pound, and perhaps as much as 5 million tons would be available at $50 a pound. These figures compare with a 1961 U.S. production of 18,000 tons U_3O_8 and a total 1961 Free-World production of 36,000 tons.

The amount of applicable energy that these reserves represent depends on the efficiency of the atomic reactors in which they may be used. (See section on technology.) The 175,000 tons of reserves mentioned above could be the equivalent of as little as 10 billion tons of coal or as much as 500 billions tons.[11] That is, as raw energy material $16,000 worth of U_3O_8 (1 ton) is the equivalent of at least $200,000 worth of coal (some 40,000 tons at average U.S. mine price of $4.85 a ton). The 5 million tons of U_3O_8 available at a higher price are equivalent to between 200 billion tons and 10,000 billion tons of coal. The figures are hard to grasp; perhaps they can be brought into perspective by noting that the minimum figure of 10 billion tons of coal equivalent is more than the amount of coal used in the United States in the past 20 years, whereas the top amount is six times as much as all the huge coal resources of the country. (See preceding chapter on coal resources.)

Additional quantities of U_3O_8 could be found if sought, and there are also quantities of thorium ore. Considering the magnitude of the above figures, however, for the purpose of this report there is no need to speculate on how much additional U_3O_8 could in fact be found, or to be concerned about the actual figures on thorium.

A related speculation comes to mind, namely, whether the money and effort that would be needed to find more uranium might better be spent in improving reactor efficiency, but the speculation tends to answer itself. Human nature being what it is, improvement in reactor

[11] Joint Committee on Atomic Energy, Robert McKinney, p. 38.

LABOR

COAL

The labor used in coal mining ranges from the unskilled to the highly skilled. Five States—West Virginia, Pennsylvania, Oklahoma, Illinois and Arkansas—have requirements regarding apprenticeship. In those States no man can be employed in a responsible mining job until he has a miner's certificate, obtainable after a year of employment, and has taken an examination. Pennsylvania requires 2 years of training for anthracite miner, and requires a certificate for anyone who handles explosives, underground or surface. In addition to the skilled miner, there are also the trained maintenance workers and supervisors. Labor supply in coal production, then, covers both quantity and quality or occupational composition.

There are three continuing official sets of statistics regarding coal mine labor: (1) by the Bureau of Labor Statistics; (2) by the Bureau of Mines; and (3) by the Bureau of Employment Security. The Bureau of Labor Statistics' figures are based on payroll information and cover both all employees and, separately, production and related workers through the working foreman level. The Bureau of Mines' figures are gathered in connection with the Bureau's mine-accident interests and do not cover store and office workers. The figures of the Bureau of Employment Security are compiled in connection with unemployment insurance laws and cover everyone on the payroll including top management but excluding the self-employed and officials of unincorporated firms. The first two tabulations are not clear as to the extent to which they include working proprietors. There are about 5,000 mines employing less than 10 men each and in which, presumably, the owner himself works. The three series differ one from the other in a way not always related to coverage; for example, in 1959 the Bureau of Mines' figures were 11,000 larger (7 percent) than the broader ranging Bureau of Labor Statistics' figures.

According to the Bureau of Mines, the average number of employees in bituminous coal mining in 1960 totaled 169,400. This is the lowest number for 70 years at least. (See fig. 36.) Of this total 84 percent were employed at underground operations, 15 percent in strip mining, and 1 percent in auger mining. Regionally, 86 percent worked in region II of this report (the Appalachian field), 9 percent in region IV (the Midwest coal field), 3 percent in region VII, and less than 1 percent the other regions.

The average number of men employed in anthracite mining in 1960 was 19,051, all of them in Pennsylvania. Eight-tenths were employed at underground operations and two-tenths in strip mining.

The total coal mine labor force is thus about 0.3 of 1 percent of the total U.S. labor force.

Three-fourths of the coal labor force, bituminous and anthracite combined, is union-affiliated, one-fourth nonunion.

Fewer and fewer young men are applying for miner's certificates, and as a result the average age of coal miners has been rising—estimated from 40 in 1951 to 45 in 1960.

There is also a substantial number of unemployed miners. In a survey made for this study by the bituminous coal industry, it was reported that during June 1961, in the seven ranking coal States plus

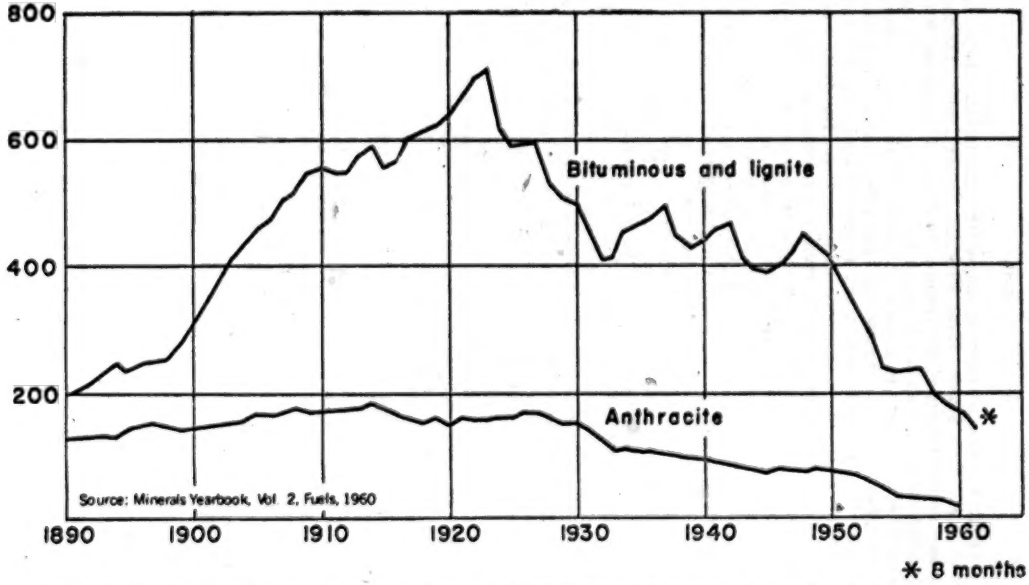


FIGURE 36.—Number of men employed in coal mining in the United States has been decreasing since the twenties, 1890–1960.

Tennessee (which eight States account for about 90 percent of U.S. production), there were 129,530 men employed and 32,760 unemployed, for a total labor availability of 162,290 in those eight States. (These figures include production workers and shopmen—i.e., hoistmen, carpenters, machinists, electricians, and the like.) There is an additional number of unemployed who do not appear on unemployment rolls and for whom, therefore, the reporting agencies had no record.

No parallel figures are available relating to the other coal-producing States, but the State coal associations in six of them, including the Western States, report an excess of available underground labor. A few having strip-mining operations reported also an excess of strip-mining employees, and a few reported surplus auger mining employees.

The United Mine Workers of America estimate that throughout the country unemployed coal miners (bituminous and anthracite) number 100,000.

In addition to the production workers and shopmen, a substantial number of persons are employed in professional capacities (surveyors, accountants, lawyers, and the like) and on the clerical and sales forces. According to some 1950 figures from the Bureau of the Census—the latest presently (February 1962) available in this regard—these may total an additional 10 to 15 percent, or some 15,000 to 25,000 persons.

Very little information is available as to the skills of those employed. The 1950 census figures give a detailed breakdown among the shopworkers but make no useful breakdown as to production skills required in operating complex mining machinery and in mine maintenance.

Although there appears now to be about 25 percent more labor than is being used, it does not follow that this 25 percent is usable. We do not know where their skills lie. If, for example, expanded production should be called for from strip mines, it may be found that there is a shortage of dragline or shovel operators; if the expanded production is attempted from underground mines, there may turn out to be a shortage of men who can operate a mechanical loader, a continuous mining or cutting machine, or who know how to put in roof bolts or to lay track.

One may assume that the unemployed workers represent all the skills involved, and in representative proportions, but the assumption is not necessarily a safe one.

Opinions from coal people vary from 1 week to 3 years as the time necessary to train a person adequately to do an underground job. The extreme range in time is due both to difference of opinion and to the nature of the job, but most coal people believe that after the year necessary to obtain a miner's certificate (2 years in anthracite mining) the average person could perform any assigned production job. Training for a supervisory capacity or for maintenance work on complex machinery takes longer. On the other hand, a man who can operate a dragline ought in short order to be able to operate a coal cutter or any other piece of equipment; the average mechanic should not need much training to be able to repair complex mining machinery. Admittedly, it may take a little extra time for a person to be-

come alert to safety factors, such as the character of the roof or t possible presence of gas.

Relation to markets and productivity

Two factors have influenced the decline in the labor force sho in figure 36: (1) less production and (2) increased output per wor (See chapter on productivity.)

Production of bituminous coal and lignite was 27 percent less 1960 than it was in the year of peak employment, 1923; assumi no change in efficiency of production the 1960 output would t have taken 27 percent fewer men, or 190,000 less than in 1923. T is the reduction in the labor force that may be attributed to smal output. The 345,000 remainder of the total reduction of roug 535,000 men (704,800 to 169,400) would be the part attributable increased output per man.

The vigorous efforts of the bituminus coal industry to improve t output per man reflects the intention to keep the cost of producti under control. In 1960, wages at $3.15 an hour were higher than any other American industry; the next highest were in petrole refining, at $3.02 an hour.* Despite the fact that bituminous co miners worked on average a smaller part of the week than other labo weekly earnings also were near the top.

In anthracite mining increasing output per man has been less a factor. The peak year of employment was in 1914. Producti in 1960 is 79 percent less than in that year. Again, had efficiency production remained constant, 1960 production would have requir 79 percent, or about 140,000, fewer men. The total decline in e ployment has been about 160,000, meaning that in anthracite minin employment has gone down about 20,000 because of improved outp per man, and 140,000 because of reduced market.

OIL, GAS, AND ELECTRIC UTILITIES

Gas pipeline companies and electric and gas utilities have deve oped comprehensive employment information, largely because of t stringent reporting requirements imposed on regulated industrie For petroleum, the information is less complete.

The following table shows 1960 figures:

	Employees	Percent of U.S. labor force
Petroleum and natural gas productions	283,000	0.
Petroleum refining	182,000	.
Gas pipelines and distribution	206,000	.
Electric utilities	340,000	.
Total	1,011,000	

Source: Bureau of Labor Statistics, *Earnings and Unemployment*, February 1961.

The 470,000 employees shown in petroleum and natural gas pr duction and in refining do not include those engaged in various phas

* U.S. Dept. of Labor Monthly Review, March 1962.

The economic advantages in the concept of "transporting coal by wire"—the burning of the coal in utility plants located at or near the mine and then moving the electricity to the point of use—lies in the fact that the average utility plant has to transport about 10,500 B.t.u.'s in the form of coal to generate only 3,400 usable B.t.u.'s in the form of electric energy, as explained in the chapter on "Technology."

CONCLUSIONS

The preceding pages on transportation contain largely descriptive material that speaks for itself for the moment and that will take on major meaning only when brought together with other material in comparing the demand for energy with the supply available (pt. VI of this report) or in discussing specific policy issues (pt. VIII). A few conclusions emerge, however, that are of direct policy relevance.

1. Except for a small amount used in the process of production, all energy, of whatever kind—coal, gas, oil and its products, or electricity—has to be transported from point of origin or production to point of use.

2. Although there has been a general downward trend in the tonnage of coal shipped by rail over the past decade and a half, and a steady decline in the percentage of coal shipped by rail, revenues from coal traffic have stayed firm as a result of adjustments in freight rates.

3. The ratemaking system used by the railroads permits adjustments in some circumstances to allow coal to be marketed at a price that can compete with oil or gas at the same destination. The cost of producing coal—a nontransportation factor outside the control of the railroads—is thus a factor in railroad freight rates.

4. The ratemaking system used by the railroads considers also the ability of different mines in the same general region to compete in common markets, and thus takes coal-mining costs into account to a still further degree. Differential adjustment has aspects of preferential adjustment.

5. On a U.S. average, railroad freight charges for at least 20 years have constituted more than four-tenths of the delivered price of coal.

6. The shortage of cars to move coal, complained about from time to time in the Appalachian and midwestern coal regions, is the result of business decision on the part of the railroads. The railroads repair damaged cars only as traffic demands it, and a shortage results when business pickup moves faster than the ability to repair the cars.

7. Whether or not such car shortages as there have been have impaired the total supply of coal to the country, or have caused users to turn to competing fuels, is a matter of opinion—there are no statistics or other documented information on the subject.

8. While in peacetime barge transportation along the waterways of the country is simply a competitive form of movement, truck haulage is a necessary part of the transportation systems for coal and oil.

9. The low direct operating cost of pipeline transportation, and its ability to deliver a product continuously, is directing attention to the pipeline transportation of coal as a competitor of railroad transportation. This development could materially influence the market outlook for coal, but its ultimate success will depend not only on pipeline technology but also on railroad technology and rates and on the political problem of eminent domain for right-of-way.

10. The economics of transporting electricity and natural gas are similar in that each must arrange to meet high peak requirements, both daily and seasonally.

EMERGENCY

We are dealing in this chapter with the same attempt at before-the-fact interpretation as in the chapter on emergency requirements. Despite the fact that the problem of emergency transportation has been under scrutiny since 1947, information on it is scanty and in some instances conflicting, and the President has directed the Secretary of Commerce (by Executive Order 10999 of February 16, 1962) to come to grips with it. The paragraphs that follow should be read within these qualifications.

COAL

The emergency transportation of coal poses a problem that other forms of energy do not, in that it competes with other bulk commodities that also use open-top cars, barges, and trucks: ores of urgently needed metals, sand and gravel for concrete and other construction, and crushed stone also for concrete aggregate, for railroad ballast and highway construction, and in smelting and other industrial processes. Information on emergency demand for these other items is lacking. A second lack is information on how much unused capacity is available for emergencies.

Heavy loss of rolling stock and facilities in prime *nuclear* target areas can be expected, but a large number of classification yards, truck terminals, and inland water terminals are in target areas of low priority—according to American transportation experts' version of the enemy's plans. Yet an attack may well be preceded by a well-timed wave of sabotage, and inasmuch as transportation is always a key focus of enemy attention, damage may be greater than suggested above. In any event, transportation equipment by its nature is always widely dispersed, and only a relatively small number of pieces will be in any presumed target area at any one time. The overall capability of the railroads, bargelines, and truck fleets is thus expected to survive a nuclear attack better than the consuming, oil refinery, and electric-generating segments of the economy. Even assuming heavy loss of rolling stock and facilities in target areas, the movement of the reduced requirement could be met, it is expected, with surviving equipment and facilities through reduction of turnaround time, alternate routings, and other measures all of which are routine in the transportation industry, such as close coordination of rail, motor, and water movements, "piggyback" operations, and cannibalizing damaged facilities and equipment. Equipment and rolling stock from the construction and ore-mining industries, both of which would be shut down for some months following an attack, could be utilized.

Locomotives offer reasonably good shielding against fallout, and tests suggest that trains should be able to travel anywhere soon after an attack. The tests suggest also that, except in areas of most lethal fallout, maintenance and repair crews could enter facilities like classification yards and repair shops within a matter of weeks.

Coal movement through the Great Lakes and by the inland waterways would be crippled if navigation locks and bulk handling facilities

nonreactive to the waste solutions; (3) to pump them into exhausted oil sands or other deep permeable formations; (4) to dump them far out at sea or on the polar icecaps; and (5) to package and shoot them into outer space. Serious obstacles are inherent in each of these. For example, in pumping into geologic formations, the chemical reaction between the waste solutions and the environment is likely to be such that the pore spaces may become quickly clogged and the whole operation brought to a halt. Disposal at sea is faced with a grand ignorance about ocean currents and the ecology of marine life.

The National Academy of Sciences has had a panel working sporadically on these problems since 1954. Research on matters of this kind moves slowly, and no one would dare predict when the problem of waste disposal will be solved. One point of view is that before the problem becomes crucial an isotope technology will have developed that will require all the Sr^{90} and Cs^{137} produced.

Corporate Concentration

In tune with industrial development throughout the country, a relatively small number of coal, oil, and gas companies account for most of the production. In logic and by analogy with other mineral industries, a few companies probably also employ the bulk of the labor, although because of mechanization in the large coal operations and because large operations are generally the more efficient, the concentration of labor is not so great as is concentration of production. If statistics are available on this subject, they are widely distributed and not readily obtainable. It is probably true also that the companies that produce the most own most of the reserves as well, but only speculative figures on reserves of coal, oil or gas company by company are available.

A similar corporate concentration exists in the electric generating industry. Electric power is generated relatively close to where it is needed—or in the case of hydropower, where good sites exists—and is used within a limited radius where it is generated, so that the corporate concentration that exists is related more to population and industrial concentration and to facts of Nature than, as in coal, oil and gas, to business decision.

Yet, while there is this corporate concentration in the energy industries, these industries are not as concentrated as many other industrial segments in America. Notable examples are the automobile, tire-manufacturing, gypsum-products, aluminum, steel, and acid-manufacturing industries, in which no more than four companies account for eight-tenths or more of shipments.

COAL

The 5 ranking coal companies in 1960, out of a total of roundly 7,500 (0.07 percent), produced almost an even fourth of the year's total output. The top 10 companies produced an even third, and the top 25 produced half. The other half was produced by the remaining 7,400 and more. See figure 64.

Some coal operations are captive, i.e., the mining companies are owned by steel companies and public utility systems and produce coal

for the parent company as needed. If these operations are excluded, the concentration is a little less acute.

The concentration by company is paralleled by a concentration in mines. Small operations have been and are being combined into large ones, inefficient small mines get shut down, and efficient mines are enlarged. Despite this, the total number of mines in operation has generally increased. Figure 65 compares the situation in 1960 with that in 1910 when coal production was on the way up and total output was the same as in 1960, at 416 million tons. Although there were a third fewer mines at that time, they were more uniform in size. Thus while 10 percent of the mines yielded 44 percent of the year's output in 1910, in 1960 this output was provided by only 4 percent of the mines. Or while 10 percent of the mines in 1910 yielded 44 percent of the output, 10 percent in 1960 yielded fully 80 percent of the output.

We do not have full information for the individual coal-producing regions. The bit that is available indicates that the national averages obscure some important regional differences. Nationally, mines producing less than 50,000 tons a year each constituted, in 1960, 80 percent of the firms but contributed only 16 percent of output. But mines of that size produced fully 56 percent of the tonnage in Tennessee, 47 percent in Virginia, and 35 percent in eastern Kentucky.

OIL

In crude oil production (again see fig. 64) a fourth of the output (1959) is by the five ranking companies. The top 10 companies produced 37 percent, and the top 15 companies 44 percent.

In refinery operations four-tenths of the output (1959) is by the first five companies. The top 10 companies produced more than six-tenths, and the top 15 companies three-fourths.

GAS

Because of the large investment required, few companies can afford to get into the gas transmission business. Moreover, the economics of scale favors large firms. As a consequence, corporate concentration is high, the highest, in fact, among this group of industries, 15 companies out of 106 (14 percent) in 1960 accounting for 84 percent of the industry's total gas sales. In gas distribution, in contrast, 84 companies (out of 1,324) accounted for this same 84 percent of the sales.

The only figures available on corporate concentration in gas production are for 1954. According to them, and by strange coincidence, concentration in this industry—as measured by number of firms and percent of output or sales—is almost precisely the same as in the gas distribution industry. Gas distribution is much the more concentrated of the two as measured by percentage of firms.

ELECTRIC GENERATION

Concentration among companies and systems generating electricity closely parallels, up to about half of total output, corporate concentration in gas distribution and crude oil production. The top 5 companies or integrated systems account for nearly a fourth (23 percent in 1960)

FIGURE 64.—A relatively few companies account for the bulk of output and sales in American energy industries.

of the kilowatt-hours sold, and the top 20 account for more than half (53 percent).

These statistics cover all kinds of companies and systems—privately owned, publicly owned, and cooperatively owned. The two largest systems in the country are TVA and Bonneville, which together in 1960 accounted for exactly one-eighth of all the electric power used.

Table 24 assists the chart in bringing the statistics into comparative focus.

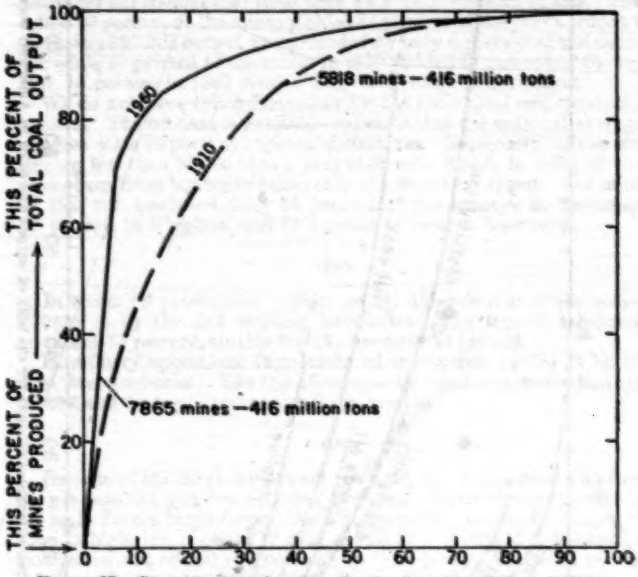


FIGURE 65.—Concentration of coal production by mines, 1960 and 1910.

TABLE 24.—*Corporate concentration among energy industries in the United States*

Number of firms	Percent of total sales			Total firms
	8	13	20	
Gas transmission	39.9	54.2	66.1	108.
Oil refining	30.4	73.1	87.2	172.
Gas distribution	23.4	48.6	65.8	1,274.
Gas production	23.0	47.0	59.0	About 11,000.
Electric generation	23.2	45.7	58.7	3,600.
Crude oil production	23.0	44.3	62.5	About 11,000.
Coal production	24.5	39.5	48.0	1,112.[1]

[1] Producing 100 tons or more a day. Total number of companies is 7,300.

CONCLUSIONS

1. Far fewer firms account for the bulk of output or sales in gas transportation and oil refining than in electric generation, gas distribution, crude oil and natural gas production, and coal mining, which four are much alike in this respect.

2. The coal industry is the least concentrated of all, gas pipelines the most concentrated.

3. The compass of greatest concentration in each of the several industries is roughly as shown below. This indicates generally the break, as read from figure 64, between, on the one hand, the few large producers who account for the bulk of output and on the other hand the relatively—in some instances absolutely—large number of firms who account for the small remainder.

	Number	Percent of output
Gas transmission	Up to 11 out of 106 companies	75
Oil refining	16 out of 172	74
Gas distribution	11 out of 1,204	60
Gas production	11 out of about 11,000	60
Electric generation	11 out of 3,600	60
Crude oil	8 out of about 11,000	60
Coal	6 out of 7,000	32
Coal, nonsaptive	11 out of 7,000	32
		34

MARKETING AND PRICING PATTERNS

COAL

The marketing of coal may be said to begin with the mining itself. This is true because the mining methods employed may so affect the product as to determine to some extent the ultimate market. For example, high-speed mechanical mining machines tend to yield a high percentage of fine or slack coal (small sizes) that cannot be sold in the markets for lump or larger size coals. Mining of the full seam, as is often done, taking the bands of impurities along with the coal, may require that elaborate cleaning equipment be installed in order to make a marketable product. In reverse, the market may influence the choice of mining methods, as for example, in the selective mining that is sometimes used in order to get the quality of coal for making coke.

Marketing

Coal is sold in the following ways:

(1) By a producing company's own sales departments.

(2) By a sales organization owned either by the producing company or by a group of producers.

(3) By a sales company that owns or otherwise controls directly or indirectly, the producing company.

(4) By the sales department of another producing company.

(5) By a broker or independent sales organization who acts as agent for a producing company under contract or who may purchase for resale.

(6) By a captive mine directly to the owner's consuming plants.

An individual company generally relies on a single method in selling most of its output but uses a variety of methods in effecting total sales.

Only a relatively few producing companies are large enough to afford a sales department or an affiliated sales company. Most find it more economical to use the services of independent sales organizations, which provide for a group of small producers the same services provided by the sales department or sales affiliate of a large integrated company.

Consumers who have a railroad siding and are able to receive at least a full carload of coal, and those who are located on navigable waterways, purchase directly from the mine's representatives. Consumers who do not have such facilities usually purchase coal from a retail coal merchant. This had led to a general categorization of customers as either "on-track" or "off-track" accounts. There is also an ever-increasing volume of coal moving by truck and barge directly from mine to consumer. In recent years, some consumers have located plants adjacent to coal mines where coal can be delivered by belt conveyor or by other suitable means direct to the consumer's plant. There are other special situations, such as the coal pipeline in Ohio, but these are not now a part of the general marketing pattern.

The retail market includes, aside from a relatively few home users, some industrial users and such other users as hospitals, apartment houses, schools, and office buildings, where coal-burning equipment requires the smaller sizes of coal. In 1960, less than 10 percent of the total bituminous coal and 70 percent of the anthracite consumed in the United States was classified as retail deliveries.

The patterns of coal usage, competition, and transportation charges vary among coal-producing areas and tend to create a geographic marketing pattern. Thus, coal produced in Pennsylvania, Maryland, and northern West Virginia is marketed primarily in the northeastern part of the United States (New England and Middle Atlantic States, including Maryland and the District of Columbia), whereas coal produced in southern West Virginia, Virginia, and Kentucky is marketed to a large extent in the Midwest, in the area around the Great Lakes, and to tidewater for export.

Figure 66 shows the amount of coal sold to electric utilities and the percent of the total utility shipments, by regions, for 1957 and 1960. The year 1957 was selected for comparison because that is the beginning of the statistical series applicable to this chapter and amenable to the regional breakdown we are using. The figures for regions V to IX are grouped in one total. Figure 67 shows the distribution of coal sold through retail dealers, figure 68 the coal sold to coke and gasmaking plants (only a few gas plants are still operating), and figure 69 to "all others," which category includes mainly industrial users.

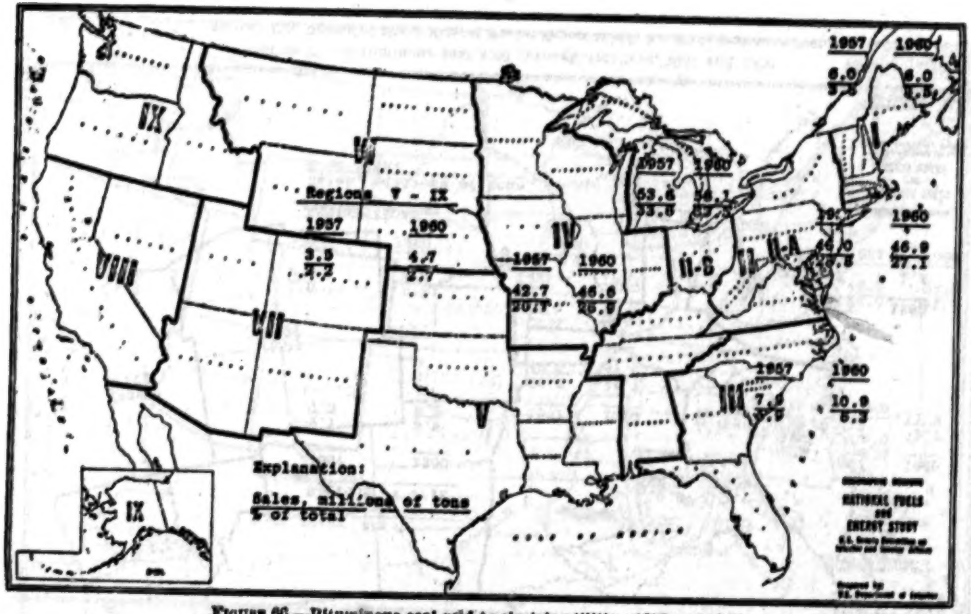


FIGURE 66.—Bituminous coal sold to electric utilities, 1957 and 1960.
Source: U.S. Bureau of Mines Mineral Market Report M.M.S. No. 2302, September 1961.

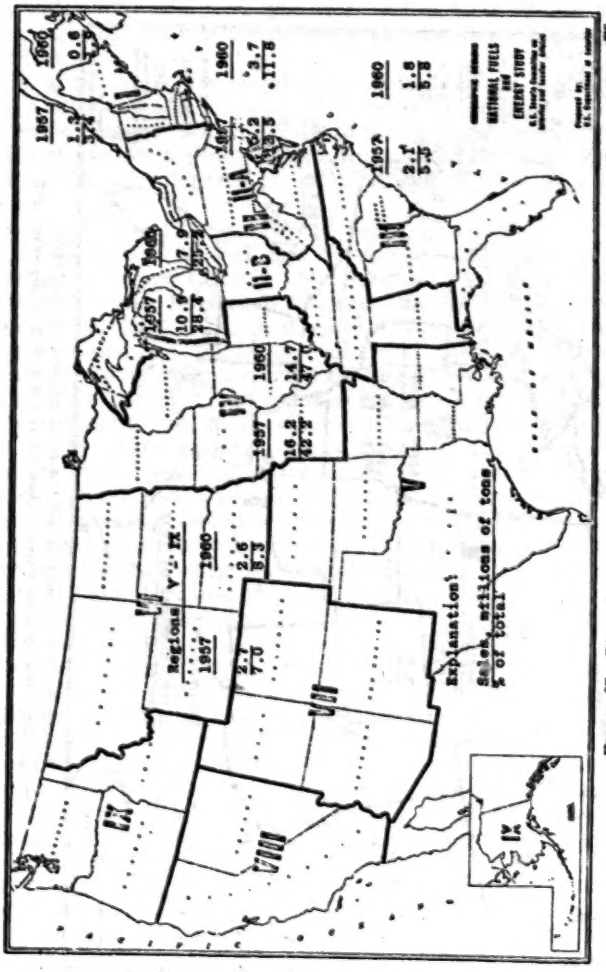


FIGURE 67.—Bituminous coal sold through retailers, 1957 and 1960.
Source: U.S. Bureau of Mines Mineral Market Report M.M.S. No. 2302, September 1961.

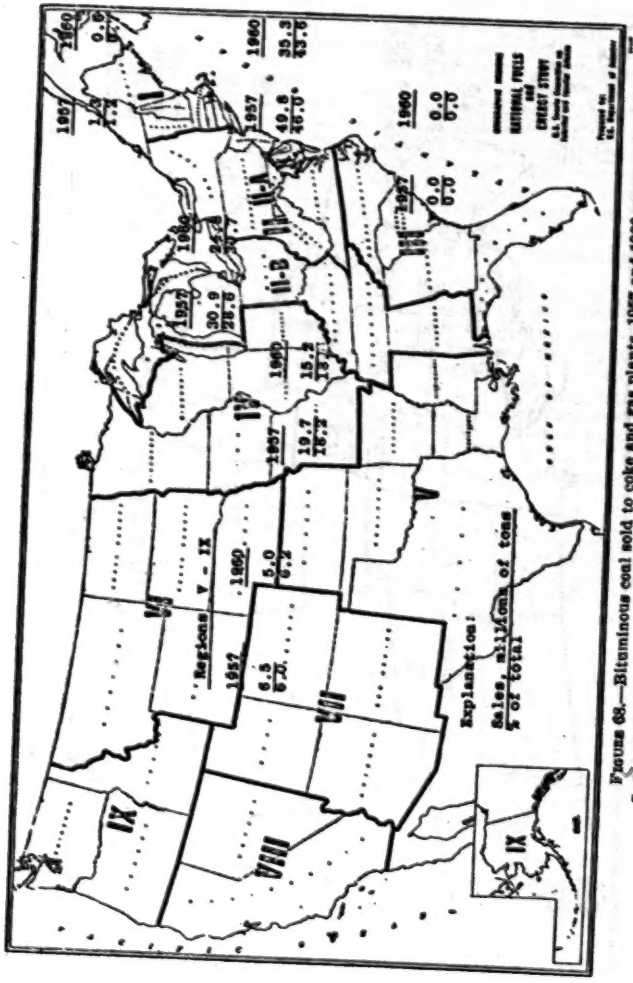


FIGURE 68.—Bituminous coal sold to coke and gas plants, 1957 and 1960.
Source: U.S. Bureau of Mines Mineral Market Report M.M.S. No. 2302, September 1961.

FIGURE 60.—Bituminous coal sold to "Miscellaneous users" in 1957 and 1960.

Source: U.S. Bureau of Mines Mineral Market Report M.M.S. No. 8302, September 1961.

Pricing

Originally all coal was sold as it came out of the mine and was called run-of-mine coal. The primary use was for heating purposes. Customer dissatisfaction with the fine or slack coal and with the fragments of rock and other impurities contained in the run-of-mine product led to the first crude forms of preparation, such as picking out the fragments of rock by hand and sizing by use of makeshift screens. The fine coal passing through the screens was usually poorer in quality than the run-of-mine and larger sizes of coal, and there was a limited demand for it. As a result, the larger or prepared sizes were priced higher than run-of-mine coal while the fine sizes were priced lower, in order to maintain an average realization as nearly equal as possible to the run-of-mine price. The introduction of costly preparation facilities at the mine led to an even greater number of size designations, each carrying a different price.

The larger sizes were sold in substantially smaller tonnages than slack sizes, with the result that the cost of marketing was considerably higher. This made it necessary to widen further the price spread between the larger sizes, such as lump and egg coal, and the finer sizes of slack. As the market for larger sizes of bituminous coal declined—railroads, home heating, and some industrial plants—many mines serving this market had to crush their coal to the smaller sizes needed by the utility and general industrial markets. A substantial part of this market was demanding more precise sizing and cleaning, and all told there may have been hundreds of combinations of sizes and qualities.

Logically there could have been a substantial increase in the price of coal to utility and general industrial markets—which by then had developed into the industry's principal source of revenue—but this was impossible because of the competition developing from residual oil, natural gas, and hydropower. Thus the price pattern that had developed under one set of market conditions persisted even after those conditions had changed.

A special pricing situation developed in connection with coal for metallurgical use. The steel industry requires coals of special quality for the production of coke. As the steel industry grew, this requirement led to the opening of mines to produce coal for that particular use. High-quality coking coal commands a higher price than other coal of equivalent sizing. But steel is a cyclical industry, and in order to keep the mines in operation and to minimize losses during periods of low steel production, the coking-quality coal is sometimes directed into the general industrial market where it must meet the price of the coal normally servicing that market.

Some mines are opened and equipped for the specific purpose of supplying electric generating plants. Many of these electric plants are willing to take run-of-mine coal, doing their own crushing. The avoidance of preparation at the mine makes it possible to quote lower prices to the utility companies able to use coal in this manner. This practice, in turn, has forced mines having elaborate preparation capacity, that was developed under different marketing conditions, to reduce their prices in order to meet the competition.

Coal is sold by three basic methods: Spot orders, annual contracts, and long-term contracts. Spot orders usually specify delivery within

30 days, although occasionally the time is extended. Annual contracts, as the term implies, provide for the delivery of coal over a period of 12 months; while usually for specific tonnages, occasionally they specify maximum and minimum allowances. Long-term contracts are generally written for periods of 5 or 10 years, although some run as long as 20 years. They often call for the entire output of a mine. No information is available on the tonnage of coal sold under contracts of various duration.

Contracts allow the mine operator to receive a stated price for his production and may allow him to benefit from increased production efficiency during the term of the contract. Long-term contracts normally have escalation clauses, usually quite elaborate, that provide for price adjustments as a result of increased labor and supply costs. They also have cancellation clauses.

Regardless of price or of the way the coal is sold, the price to the consumer or retailer is usually f.o.b. the mine. Exceptions to this general rule are when coal is sold to commercial dock operators on the Great Lakes or at tidewater for export. The price f.o.b. mine for a particular class of coal is not, however, always the same, adjustments sometimes being made to offset freight charges in some degree in order to meet competition.

An appreciable amount is sold on the basis of B.t.u.'s delivered to the purchaser's plant. Government purchases generally embody penalty clauses by which the supplier receives less per ton for his coal if the B.t.u. value or other quality drops below that guaranteed in the bid; Tennessee Valley Authority contracts include both premium and penalty clauses, as do also some commercial contracts.

The bituminous coal industry does not post formal price quotations. The Bureau of Mines publishes statistics on average price of coal sold, f.o.b. mine, making a distinction between coal sold in the "open market" and coal "not sold in open market." The latter category refers to production by mines owned by or affiliated with the consumers. The Bureau of Labor Statistics publishes figures on wholesale prices. The figures published by the Federal Power Commission are delivered prices to steam electric plants, reflecting, therefore, from year to year not only changes in the f.o.b. mine prices but also changes in the source of supply, method of transportation, and freight rates.

CRUDE OIL

As described for coal, the marketing of which begins with the mining operation itself, the marketing of crude oil spans the entire territory from the wellhead to the refinery.

The movement from field to refinery is discussed in detail in the chapter on transportation, but a few features that affect marketing practice are repeated here. The large trunk pipelines for the most part are owned by the large integrated companies and are common carriers subject to regulation by the ICC. The gathering lines that connect individual producing leases to the trunklines also are owned generally by the pipeline companies, but some are owned by the producers themselves. When a well is brought into production, its operator understandably seeks to market the oil by selling it to someone who can provide a pipeline connection.

PART IV—INTERFUEL COMPETITION

Introduction

Competition among fuels is a complex of economic, technologic, and political forces. The three fuels—coal, oil, and gas—compete with one another for the electric energy, space heating, and process-heat markets; electric energy (including hydropower) then competes with coal, oil, and gas for parts of these same markets. The subject is complex technologically because of the many areas in which it operates, as described in the chapter on technology: production, conversion of the raw fuels to energy, transportation, and use. As technology changes, so do costs and competitive relationships. The joint techno-logic-economic complexity is compounded by atomic energy. The subject is politically complex because it is involved with problems of trade, utility and transportation regulation, conservation, public versus private power, and such social problems as unemployment and public fears regarding disposal of atomic wastes.

The present chapter attempts to untangle some of this complexity. As indicated in a preceding chapter (Part I: Energy in the Economy), part of the market held by each of the fuels is noncompetitive with other fuels. The following pages deal only with the interfuel competitive aspects.

Historical Perspective

Prior to the Civil War, wood was the dominant fuel in this country, both for home heating and as industrial fuel; more than half of all iron produced, for example, was smelted with charcoal. (See figs. 1 and 90.)

When coal began to displace wood, it did so as a unique energy source that provided services wood could not. Its flame was found to be more adaptable and controllable; its energy was found to be more concentrated, so that it was more easily and cheaply transported; it could be handled more readily than wood logs or charcoal; and it was available in quantities that wood could never achieve. It invited new and expanded uses. Between 1850 and 1890, consumption roughly doubled every decade, largely the result of increasing use as a metallurgical and locomotive fuel. Then after 1900 came the rapid growth of the electric power industry. None of these markets could have developed with wood. Coal dominates the electric generating market to this day.

Coal reached the peak of its growing share of the energy market in 1910, having yielded to a new fuel—oil—unique and necessary to the time in the same way that wood did when it yielded to coal. Oil initially had a small use for illumination, but after 1900 it began to be used more and more by railroads and naval vessels. Just as coal had formed a long-lasting union with electric generation, oil formed a long-lasting union with transportation. The demand for motor

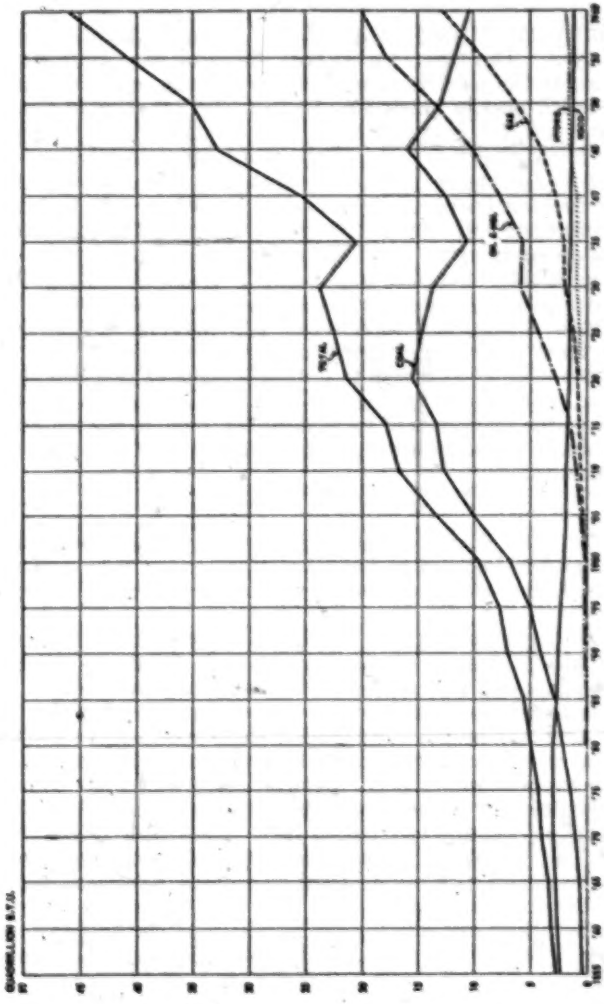


FIGURE 90.—Trends of competitive consumption of primary energy in the United States.

Source: 1855–1955 after Schurr and Netschert, "Energy in the American Economy, 1850–1975," pp. 511–513; 1960 Bureau of Mines final summary.

fuels increased sixfold in the period from 1925 to 1955. Concurrently, oil was invading other coal markets as well, and by 1940 had preempted a great deal of the home heating market. The net result has been a decline in coal consumption that, except for an interruption during World War II, has persisted to the present. The two peak periods, 1918 and 1943–44, were war years.

Oil in its turn—and coal, too—has had to face up to gas, as unique with respect to oil and coal as oil was with respect to coal, and coal to wood. Gas became competitively active on a national scale as soon as there was developed a technology of constructing high-pressure, long-distance pipelines to carry it to a waiting market. In 1945 only about 1 trillion cubic feet of natural gas entered interstate commerce. By the mid-1950's, this volume had increased fivefold; by 1960, eightfold. Gas displaced coal in a number of industrial uses, and coal and oil in space heating—a market that had been previously claimed by wood, coal, and oil in turn. The movement of gas into this market has been one of the major factors slowing the growth of oil consumption.

Table 1 in part I suggests the end-use patterns presently in existence. The table shows the pattern in detail as it was in 1955, which is the latest year for which this breakdown has been published, together with the totals for 1961. The cycle is not ended, for electricity is making inroads into the gas-residential market.

Influencing Factors

Competition among products serving a common market can be defined as the pattern of effort among the producers of those products to secure the favor of the customer by offering to meet his wants on the most favorable terms. The quantities used represent the result of those efforts. In other words, competition results from the ability and willingness of the customer to shift from one product or supplier to another. When, in an economic sense, consumers of fuel are able to shift freely from one fuel to another, there is intense competition among the fuels, and the degree of competition intensifies and softens as this freedom of choice expands or contracts.

Many factors influence this freedom of choice. In part of the energy market, the consumer has equipment that enables him to switch at will from one fuel—coal, oil, or gas—to another; freedom of choice is wide, and competition is keen. In other parts of the market, more than one of the fuels could serve the purpose, but some added investment in the way of new equipment may be needed; the economic choice is less free and competition accordingly less keen. In still other parts of the market, one fuel may satisfy the consumer's wants in a way that no other fuel can, in which case he really has no practical choice, except as to which supplier he selects.

Where more than one fuel may be used, the choice is approached initially on the basis of cost. Other factors are convenience and simple preference, and particularly reliability of supply. However cheap a fuel may be, it may not be selected if the user cannot be certain, within the dictates of his needs, that he can get it in any quantity he wants whenever he wants it and at a price he can afford. There are also political factors, which may circumscribe all the others and that operate in a manner not always immediately obvious. At any partic-

ular time, Congress or other authorized public institution may determine that the public welfare requires some interference with market economics, in which case a whole chain of consequences may ensue.

The situation at any given time represents an economic equilibrium, but the equilibrium is both fragile and fleeting.

Each of the several factors is discussed under appropriate headings in the following pages, to the degree necessary to open the way to a discussion of competition in the individual market areas. Many are intimately related, and the limits of discussion are in a sense arbitrary. The point of much that is said has already been made and documented explicitly in earlier chapters.

THE PHYSICAL CHARACTER OF FUELS

The historical development of the use of fuels is based in good part on their physical character. As already noted, one reason coal replaced wood is because the energy in it is more physically concentrated; as a result, the flame is more controllable, and small hunks of this concentrated energy can be handled more easily than one can handle logs of more dilute energy.

The solid nature of coal has influenced not only its competitive strength in early years but also its competitive weakness of later years. When coal is mined, it must be broken away from its native confinement. The pieces must be physically loaded and then (although some coal gets burned in the form in which it leaves the mine) moved out of the mine to a cleaning plant, dumped, ground into smaller pieces, separated from the processing water and again picked up and loaded for transporting. It should not be inferred that these are separate steps. They are not; in modern operation the sequence is continuous and automatic, but it does call for equipment, labor, and expense all related to the fact that coal is solid. At the destination, the coal must be unloaded again and then moved through another series of steps, all required because of the solid nature of coal, before it reaches the burning device. When it burns it produces an ash that must be removed. The mechanics of producing, delivering, and using a liquid or gas are much simpler, although, to be sure, the liquid and gaseous fuels go through their own processing steps before they are usable.

The rental or availability of storage space and railroad spurs in cities where real estate values are high may be an appreciable factor in the consumer's decision on what fuel to use.

The softness of bituminous coal causes it to abrade and to form dust. The dust is dirty, and this militates against its use in the space-heating market. This, of course, is not true of anthracite.

Architects and consulting engineers prefer the simpler design and fewer potential difficulties associated with the use of liquid or gaseous fuel. The continuing attempts to liquefy or gasify coal, going back many years, and the present development of the coal pipeline, are attempts to overcome the disadvantage of the solid state.

At the same time, the solid state has an advantage in some uses. Coke not only supplies heat in smelting processes, but physically supports the ore mass.

As to oil, its liquidity has constituted its most distinct advantage. Small compact engines have been built around this trait and are now

thoroughly established as an almost unchanging part of present-day technology. Nearly a fifth of all the energy consumed is used to run motor vehicles, diesel locomotives, and aircraft. If coal can be made effectively "liquid" so that it can be used in turbines, it may recapture part of this market.

Yet, because it is a liquid, oil has a disadvantage with respect to gas. With gas, the user need only turn a valve, whereas to use oil he may have to provide storage space and tanks, and unloading docks or access roads and truck turnaround space. He may have to go to the added effort and expense of installing equipment to control air pollution. Oil, being a liquid, has dissolved in it constituents that sometimes foul equipment and leave a greasy soot that many homeowners dislike.

The heat of gas—and of electricity—can be distributed evenly more readily than can the heat of coal or oil, and the heat level can be maintained indefinitely. Gas flame can be pinpointed in a way that no other fuel permits. Still, the physical nature of gas is not all advantage. Explosions do occur, as indeed they do with oil. Because gas *is* a gas, it must be transported by pipeline, and it cannot go to market unless a pipeline will take it there, not only physically but economically. Oil, on the contrary, can choose a pipeline, barge, tank car, or truck as fits a specific competitive situation. It is this transportation feature regarding gas that has engendered the effort to liquefy it.

SUPPLY

The cost of energy starts with the cost of the primary material. To now, there has been no lack of coal, oil, and gas in the ground that would exert an upward pressure on price. As implied in the chapter on the comparison between requirements and supply, this promises to continue to be true. In terms of dollars having a constant value, the cost of finding, developing, and producing oil and gas jointly appears to some observers to have been fairly constant and on average could well remain so for some time; the great coal resources of the country make this even more probable for coal.

Another element of supply as it affects competition is assurance of delivery. International crises have sometimes caused oil shortages in particular markets, and this is sure to happen again some time or other. Work stoppages in the bituminous coal industry have caused disruption in delivery, but there has not been an industrywide strike in the coal industry in over 12 years, and railroad strikes also are much less a matter of concern than formerly.

PRICE

A distinction must be made between the delivered price of a fuel and the price at the pithead or wellhead. Both are quoted in economic discussions of fuel competition. It is not always easy to remember that a fluctuating transportation cost must be added to the field price and that sometimes this is greater than the cost of the fuel itself.

Delivered price is normally both an ambiguous figure and an incomplete one. It is ambiguous because it is quoted in terms of the natural unit—ton, gallon, or cubic feet—whereas it is not the natural product burned that is significant but the energy the product provides. It takes 4⅛ barrels of heavy oil or about 25 M c.f. of gas to provide the same amount of energy as a ton of coal.

The delivered price of a fuel is an incomplete figure because to it must be added the cost of equipment and labor needed to use it. Whereas to use gas one need only install an appropriate burner and turn a valve, to burn oil or coal he must provide a variety of other equipment and services. Both delivered price and utilization cost are taken into account when a consumer makes his choice of fuel. In some cases, the differences between the fuel cost and the "cost as consumed" may be quite large. For example, the estimated cost of a 10,000-pounds-per-hour boiler unit, installed, is about $16,000 for gas and $35,000 for coal. The coal unit costs the more because it requires equipment—such as a stoker, storage bins, and ash-removal facilities—that the gas unit does not and because of higher installation costs. As a result, gas can be dearer than coal in terms of delivered B.t.u.'s, yet the lower capital charges can make gas the more economic overall. On the other hand, the aggregate saving in the cost of coal at the plant gate over a period of years may more than offset the higher capital costs. In larger boiler units, in those areas of the country where coal is economic, this is usually the case.

TRANSPORTATION

Geography initially establishes the general patterns of fuel consumption and is responsible for the location of many fuel-consuming industries. The reason is the absence of a transportation cost. The coke-oriented steel industry, for example, had its origin near the coalfields of the Appalachians; few, if any, significant carbon black plants operate outside of the oil and gas fields of the Southwest. Generally every fuel is cheaper at its point of production—at the wellhead or mine mouth—than is another fuel that must be transported to that same location. Gas originating in the Southwest is transported through pipelines that traverse near the coalfields, yet in West Virginia, Ohio, and other eastern coal States virtually all the electric utilities use coal. Then, as these fuels move toward more distant markets, the relatively higher unit transportation costs for coal dispel some of this locational advantage.

This element, transportation, is what makes interfuel competition so severe in those areas having little or no native energy resources, such as along the Atlantic seaboard, particularly in New England. In order to compete, the several fuels must be priced approximately the same on a B.t.u. basis as delivered, particularly in industrial markets. Even for space heating, the preference premium paid for gas cannot get too high.

Transporting coal always comes high, constituting on average throughout the United States more than four-tenths of the delivered price of bituminous. From a given region of production, the delivered price of coal is directly related to the distance traveled.

The cost of moving oil is low or high depending on how the movement is made. Heavy fuel oil or crude oil can be shipped from the gulf coast or from the Caribbean to the east coast cheaply, but from there it moves by rail, barge, or truck at costs that are roughly comparable to the cost of moving coal. The low cost of marine transportation is one of oil's major competitive strengths, especially in those locations that can be supplied directly from the tanker. The pipeline transportation of gas is substantially less than the cost of moving

coal or oil by rail, but higher than the cost of moving oil (or coal) by ocean transport.

TABLE 40.—*Prices at point of production*

	Oil—Bunker C—Posted prices [1]				Natural gas [2]		Bituminous coal, dollars per ton [3]
	At gulf coast		At Aruba				
	Dollars per barrel	Dollars per ton, coal equivalent	Dollars per barrel	Dollars per ton, coal equivalent	Cents per thousand cubic feet	Dollars per ton, coal equivalent	
1946	1.23	5.07			5.3	1.34	3.41
1947	1.69	7.03			6.0	1.52	4.16
1948	2.43	10.10			6.4	1.65	4.99
1949	1.43	5.95			6.3	1.60	4.82
1950	1.68	6.99			6.5	1.65	4.84
1951	1.73	7.26			7.3	1.85	4.92
1952	1.84	8.07			7.3	1.85	4.92
1953	1.70	7.07			7.3	1.93	4.80
1954	1.85	7.60			8.7	2.32	4.92
1955	2.00	8.33			10.1	2.65	4.82
1956	2.14	8.90	[4] 2.40	9.97	10.4	2.62	4.80
1957	2.65	11.03	2.36	10.02	10.8	2.67	4.89
1958	2.20	9.15	2.18	9.05	11.3	2.74	4.63
1959	2.00	8.32	2.00	8.32	11.9	2.89	4.55
1960	2.17	9.02	2.00	8.32	12.9	3.15	4.77
					14.0	3.30	4.69

[1] Platt's Oil Price Handbook.
[2] Bureau of Mines.
[3] Dec. 31, 1959.

Table 40 shows the postwar pattern of prices, at points of production, upon which U.S. transportation charges are mounted. The prices shown for heavy fuel oil are posted prices, but for the gulf coast these are representative of actual sales price. (Posted prices for gulf coast bunker C oil are not usually subject to discount.) Caribbean fuel oil is subject to discount, however, by unknown amounts, so that sales price is cheaper than posted price. According to the table, the price of heavy fuel oil at the point of production, and as measured by its heat content, has been nearly twice the price of coal at the mine since about 1956, while the price of gas has been substantially less than the price of coal. (New contract prices for gas sold to pipelines have been going up, and the contract prices now being negotiated make the price of gas equivalent to that of coal at $4.37 a ton, or substantially the same for the two.) The fact that coal has difficulty competing with oil in markets near the ports of entry is a measure of the high transportation cost that coal bears.

With its relatively high cost in eastern harbors and high overland transportation charges, the market for heavy fuel oil is confined to a strip bordering the waterways, about 125 miles inland from the coast and 20 miles each side of the major riverways. Each mile overland adds more to its delivered price while reducing the delivered price for coal at the same location. The point is soon reached where it is uneconomic to move residual oil farther inland, and coal and gas then compete for the market under similar considerations.

Gas has much farther to go, generally, than coal, and its initial large price advantage over oil and lesser advantage over coal are ultimately overcome, despite its low transportation cost. The States of Vermont and Maine use no natural gas for this reason.

In concept, there is a degree of similarity in the pricing of transportation services for all three fuels. The sale of interruptible gas represents an adjustment in transportation charges, and so is analogous, in this sense, to the reductions in rail rates covering the movement of coal to New York Harbor and of residual fuel oil into New Hampshire in order to sustain competition. (See Part VII: Policies, Laws, and Regulations.)

JOINT PRODUCT CONSIDERATIONS

All three of the major fuels are produced or transported as though they were jointly produced or transported with other products. Electricity, too, is sometimes a joint product. This factor has an impact on pricing and competition.

Coal mining yields several products in the form of different sizes, and aside from what is deliberately produced some fine coal is unavoidably produced in coal-cutting operations. Coals of special quality also are produced for specific markets. In some mines the successful extraction of metallurgical coal requires the mining of a certain proportion of steam coal as well, and in many instances availability of metallurgical coal therefore is directly related to the market for steam coal; in other cases the reverse is true. In the opposite direction lack of demand from the steel industry can and does send metallurgical coal into the steam market.

Oil and gas are produced jointly, of course, and both are frequently produced from the same well. The proportions differ. The industry can shift its efforts somewhat between the two, but it can never be sure whether successful exploration will result in oil or gas.

Heavy fuel oil is a byproduct of refining in the United States. As with byproducts generally, the minimum price required in its sale is an amount large enough to balance out-of-pocket transportation and production costs. However, the lower the price, the more the incentive to install equipment to convert it into other and more valuable products. This is happening now, the yield of heavy fuel oil having been declining markedly in the United States for well over a decade. On the other hand, heavy fuel oil of foreign origin is not a byproduct, nor is it priced as one. It is a prime product at all Western Hemisphere refineries outside the United States and Canada and accounts for the bulk of their total output.

The electricity generated at Government-sponsored power facilities is frequently a byproduct. Power from the St. Lawrence Seaway is a byproduct, so to speak, of the principal objective to improve transportation, and in Western States it is a byproduct of an irrigation objective, along with conservation and recreation. This byproduct is marketed in direct competition with the fuels. Similarly, electric generation related to the atomic energy and nuclear power programs also may be called a byproduct.

Transportation, too, has its joint-product aspects. Transportation of coal is a joint service with transportation of other bulk commodities and competes with them with respect to rates and for rolling stock. There is also an analogy in marine transportation, in that tankers that would otherwise be idle are sometimes used in transporting grain. Natural gas pipelines sometimes find that they have idle capacity in

offpeak periods, which idle capacity, in the sense that it is unavoidably created as a result of supplying another market, can be called byproduct; as is normal in byproduct economics, the item is sold if a market exists and if it is economically feasible to do so.

TECHNOLOGY

The effect of the technology of exploration, production, and transportation on competition gets incorporated in the cost and price of the product, which have been discussed above and need no further reference here except to draw attention to the record of the coal industry. Even though wage rates and the cost of materials and mining machinery increased an average of 70 percent during the decade 1950–60, the average price of coal f.o.b. the mine has managed to stay firm as a result of the cost-controlling effect of mechanization.

Of more immediate relevance to competition is the technology of use, which has acted particularly to the detriment of coal. Annual retail deliveries of coal (mainly for space heating) declined by about 55 million tons from 1950 to 1960 with the switch to oil and gas, and railroad use of coal dropped 60 million tons in the same period as the railroads converted from steam to diesel engines. Thus these two factors alone reduced coal consumption by about 115 million tons a year, or nearly 80 percent of the total decline in the nonutility areas of consumption. Conversion of ship use from coal to heavy fuel oil and improvements in iron smelting claimed an additional 25 million tons of annual output.

Another technologic development has been the progressive improvement is what is called heat rate, by which is meant the weight of coal (or B.t.u. content) used in an electric generating plant to produce 1 kilowatt-hour of electricity. This is described in detail in the chapter on the technology of electric generation. As recently as 1950 the heat rate averaged about 1.2 pounds of coal per kilowatt-hour; in 1960 it averaged less than nine-tenths of a pound. This reduction over the past 10 years alone "cost" coal some 60 million tons a year at present rates of electric generation. Generation of electricity from oil and gas has experienced similar but less striking improvements in efficiency.

Another facet of technology and its impact on fuel competition relates to small boilers, those that serve the general industrial market as opposed to the electric utility market. The major change in industrial energy utilization has been the trend toward what are called package boilers, by which is meant boilers assembled at the factory and shipped as one piece, with consequent savings in cost, particularly of installation. The package boiler is much more adaptable to oil or gas firing than to coal firing, and can be designed for much higher capacities per dollar of cost or unit of size.

Still another area of technologic change is now beginning to erode the coal market. Until about 3 years ago the metallurgical fuel market was considered captive to the coal industry. During the past 50 years coke accounted for nearly all the fuel used in blast furnaces, but now oil or gas can be injected with the air blast, reducing the amount of coke needed. Coal technologists are moving to combat this by injecting coal with the airblast.

GOVERNMENT POLICY

Government policy has such pervasive influence that a special part of this report is devoted to it. It relates to competition in many ways: Through its impact on supply, ranging from limitations on production (oil and anthracite) to controls of imports (oil) and control over construction of facilities (gas and electricity); through direct competition between Government and industry in electric power; in its impact on prices and costs, both indirectly through import duties and other taxes and directly through control over sales contracts, utility ratemaking, and cost of transportation; and in control of the end use of the fuels, i.e., "inferior use" of gas (the *Transco* case) and air pollution. (See part VII.)

A point not previously discussed in detail is that different jurisdictions of Government sometimes pull in directions that have opposite effects. Several different agencies regulate, control, or otherwise influence competition among the fuels, and each tends to act independently of the others within its own interpretation of its charter. We have made no attempt to itemize such occurrences, but the following instance has been brought to our attention. While the Department of the Interior maintains quotas against the import of foreign oil in order to help sustain the American industry, the maritime laws of the United States (through the requirement that coastal movement of oil be in relatively high-cost U.S.-flag tankers) operate in the opposite direction by giving foreign oil and oil products a price advantage over domestic fuel.

There are other instances, of course, in which Government policy pulls in only one direction. For example, Government is a large consumer of fuel, and its procurement practices therefore exert important competitive pressures. A specific example in this regard is the Tennessee Valley Authority, the largest single purchaser and consumer of coal in the United States. In 1960 it purchased about 19 million tons of coal (to the exclusion of other fuels), mostly from mines that sell also to public utilities. Of this amount, 1,800,000 tons consisted of spot purchases each under $10,000, at prices generally lower than paid on term contracts and in some instances from the same supplier. Spokesmen for the coal industry say that the result of TVA purchases is a pressure on the producers to charge other utilities the same low price they charge the Tennessee Valley Authority. In making contracts the TVA can take advantage of special rates applicable to transportation of Government property. Another illustration is the setting aside, in Government purchase contracts, of certain portions of Government fuel procurement to be met by small producers.

Two final points may be made:

Hydropower produced by public projects, both Federal and State, is sold to electric utilities sometimes in competition with fossil fuels. A case in point is the operation of the Power Authority of the State of New York, which has arranged to sell much of the electric energy from Niagara Falls and the St. Lawrence project to utilities in the State. Blocs of power have been sold to the Niagara Mohawk Power Co., Rochester Gas & Electric Co., and New York State Electric & Gas Co. These companies operate a number of large coal-burning

generating stations. Through the distribution facilities of these three utilities, the power authority has arranged also to distribute electricity to other companies beyond the State. Between 1958 and 1961 the Niagara Mohawk Co. decreased its coal usage from 3.2 million tons to 2.5 million tons while during the same period increasing its purchases of hydropower in coal equivalent to 3.3 million tons.

Much public regulation initially had no intention of influencing competition among fuels. The legislation was for the purpose of protecting the American consumer in his direct relation with a particular producer or was related to some other aspect of national interest. Some Government actions thus now find themselves in an environment for which they were not designed and on which they therefore have an influence not foreseen. For example, the commodity clause of the Interstate Commerce Act (1906) prohibits railroads from owning properties that produce the freight the railroads haul. A second clause exempts bulk transportation by water carriers from regulation. At that time coal was the principal fuel, and the railroads the principal carriers, and their competitive position was not affected. Now there are three basic fuels and additional methods of transportation, and the competition is keen.

REGIONAL FACTORS

Aside from the circumstance that fuels are most widely consumed near their points of production, fuel consumption reflects also regional shifts in industrial concentration. The migration of the New England textile industry to the South, for example, added to one region's fuel consumption while subtracting from another's. When such shifts occur between one native energy region and another, one fuel may be substituted for another. There is no information, however, on how much this amounts to except in an illustrative way here and there. According to the latest Census of Manufacturers, iron foundries in the coal-consuming regions of New York, New Jersey, Pennsylvania, Ohio, Illinois, and Michigan reported less activity for 1958 than for 1954, while foundries in the gas-using areas of California and Texas reported a substantial increase in activity.

An example of the regional factor is in the development of nuclear energy. By some happenstance, the first two commercial reactors—Shippingsport, Pa., and Dresden, Ill.—are in coal regions.

CONSUMER PREFERENCE

Consumer preference for a particular fuel is such a common phenomenon that little need be said about it here.

Despite the fact that natural gas and heating oil are more expensive than coal in some areas, they are preferred by householders to such an extent that they have taken over a large segment of the space-heating market. Gas is taking away markets from oil for the same reason—simple preference.

In the industrial market it is technically possible to conduct numerous operations with any fuel, but often the user prefers one over the other because it makes his task easier, although, to be sure, the choice is influenced also by technical considerations. As already indicated, the heat of gas and electricity can be distributed more readily than the heat of coal or oil, and the heat level can be maintained indefinitely.

Individual Markets

RESIDENTIAL AND COMMERCIAL

In the postwar period the use of electricity in the residential market has grown at an average compound rate of 11 percent a year, gas at 10 percent, and petroleum at 7 percent, although the rates of growth have been much lower in the past 5 years. The use of coal has declined at a rate of 10 percent a year. In 1960 oil and gas each held about 40 percent of the market, and coal and electricity each about 10 percent.

The commercial market is primarily for heat and power—in hospitals, apartment houses, schools, and office buildings—and resembles the residential market. It is fairly small. In 1960 the market shares were gas 50 percent, oil 17 percent, coal 10 percent, and electricity 23 percent.

The top space in figure 91 shows the postwar changes in the deterioration of the retail coal market; retail deliveries (i.e., the residential, commercial, and some "offtrack" industrial markets) in 1960 totaled only 30 million tons or 67 million tons less than in 1947. Most of this decline was due to the switch to oil and gas for heating. The use of electricity for residential heating may enable coal to recapture some of this market.

Of the retail market remaining for bituminous coal about 60 percent is in the Midwest, primarily in Ohio, Indiana, Illinois, Michigan, and Minnesota. Most retail coal has been mined in the southern Appalachian area in the States of Virginia, West Virginia, and Kentucky. Even though the retail market declined nearly 20 percent between 1957 and 1960, these three States still supply about half of the retail market and any further loss would be taken mainly by them. The primary market for anthracite is Pennsylvania and in New England and adjacent States.

The price relations involved in the residential market are shown in figure 92, which shows indexes back to 1935 for added perspective. During this 25 years the average retail (delivered) prices of coal and oil have been consonant, indeed almost identical. The rapid rise in the price of each right after World War II was the result of the removal of price controls, and the rise ended as soon as they reached the competitive ceiling imposed by gas. Since that time the prices of the three have reflected their competitive interdependence. In 1948 and again in 1957 oil appears to have tried to push ahead, but each time was pulled back by the competition of the other two. As noted, the series shown for gas is for space heating only and does not reflect the average price paid by residential user for all gas. For example, from 1950 to 1960 the space-heating index rose by 44 percent. During that same period the average price for all residential gas as reported by the American Gas Association rose by 17 percent.

But these are national averages, whereas competition is more of a local problem. Figure 93 shows price relationships in Boston, a city for which there are data and that is in a hotly competitve area. Until 1953 the gas used in Boston was manufactured gas, made locally from coal and oil, and its price necessarily reflected the competitive

87538—62——19

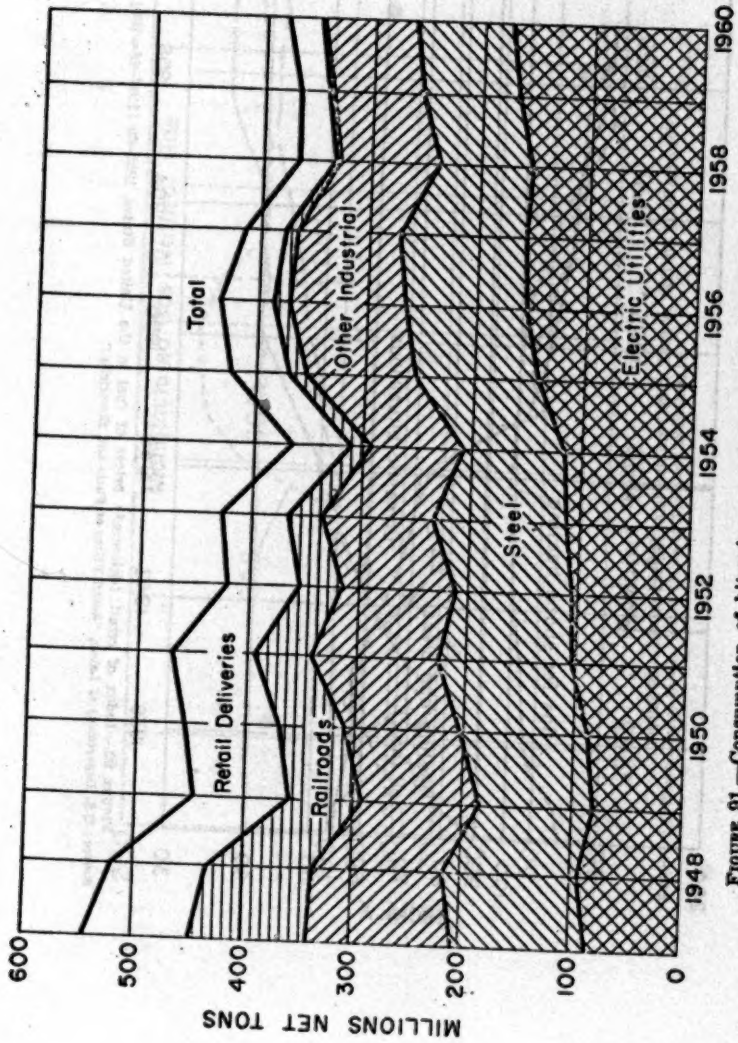


FIGURE 91.—Consumption of bituminous coal, by consumer class, 1947-60.

Source: U.S. Bureau of Mines (Minerals Yearbook).

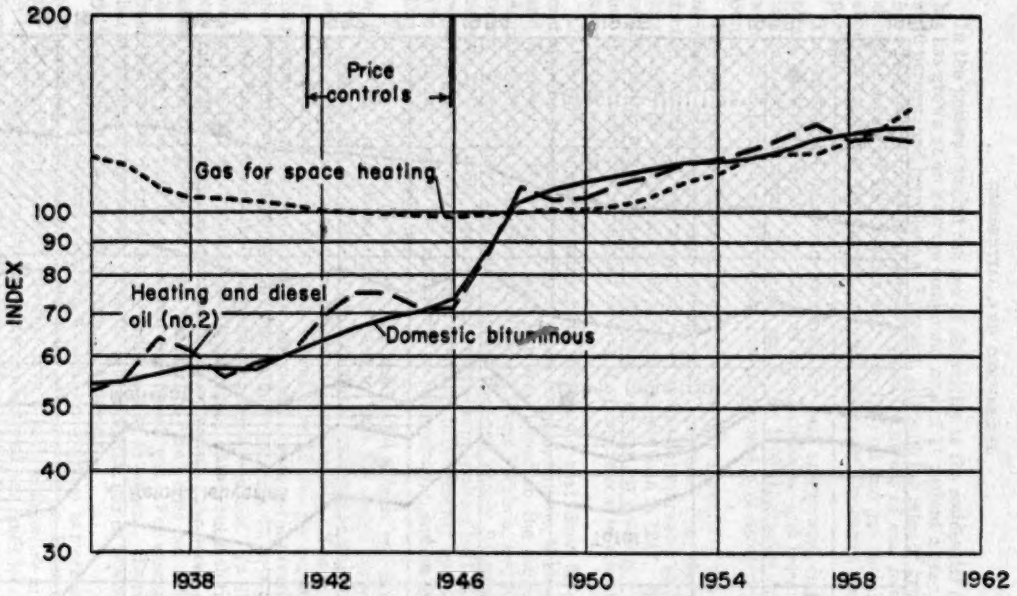


FIGURE 92.—Index of retail (delivered) prices of fuel in the United States, 1935-60 (1947-48=100).
Source: U.S. Department of Labor, "Retail Prices of Fuels and Electricity."

FIGURE 93.—Indexes of prices of heating fuel in Boston, 1941–60 (1947–49=100).

Source: U.S. Department of Labor, "Retail Prices of Fuels and Electricity."

prices of these fuels. As the price of manufactured gas rose, it provided an invitation for natural gas to come in. Once there in abundance, natural gas had to be competitive, and the price sought out a level that made it so.

INDUSTRIAL

There are two parts to the industrial market: electric power generation (mainly public utility) and general industrial use.

Power generation

The power-generation market is probably the best mirror of what happens in interfuel competition. Minor differences in delivered price, multiplied by very large quantities, can amount to large sums of money to the user. Costs associated with utilizing fuels—handling, storage, and entry facilities—also are large. The electric utilities are among the most well-informed buyers of energy and the quickest to take advantage of price differentials and changes in technology of utilization. Since electricity can be generated equally well by gas, oil, or coal, no single fuel has an impregnable position in this market.

TABLE 41.—*Cost of fuels at steam electric powerplants, 1952–60*

(Cents per million B.t.u.)

	Coal	Oil	Gas		Coal	Oil	Gas
1952	27.2	22.1	14.5	1957	27.3	24.4	19.5
1953	27.3	22.3	16.7	1958	27.4	25.6	20.7
1954	26.1	22.6	17.3	1959	26.5	25.2	21.2
1955	25.2	23.2	18.0	1960	26.0	24.5	22.6
1956	26.2	27.9	18.5				

Source: Federal Power Commission.

Figure 94 shows fuels utilization by areas for thermal electric utilities in 1952, 1957, and 1960, which bracket the years for which good data are available. Different fuels predominate in different regions. The coal share declined nationally very slightly between 1952 to 1960, and somewhat more from 1957 to 1960. By regions, the pattern has been diverse. To illustrate: In region II–A, coal's share declined while the shares of oil and gas rose; in region II–B coal rose while oil and gas declined. These relationships refer only to the steam electric market and may differ substantially from those calculated for total electricity generated. In region IX, for example, the 88 percent shown for gas is equivalent to less than 1 percent of all electricity generated in that area, which is served primarily by hydropower.

The National Coal Association has tabulated electric utility consumption of coal in what it calls the "coal-competitive area," the area cross-hatched in figure 94. The market share of each fuel in this area is shown in figure 95. It appears that no single fuel has been able consistently to undersell the others. In recent years, most of the new electric generating facilities constructed east of the Mississippi River have been designed to use coal as the primary fuel, although there are major exceptions. In electric powerplants placed in service between 1955 and 1960 in this region, coal constituted 94 percent of all fuel used in 1960; oil 2 percent, and gas 4 percent. The

FIGURE 24.—Percentage of the steam electric generation market held by coal, oil, and gas, by regions.

SOURCE: National Coal Association, "Steam Electric Plant Factors."

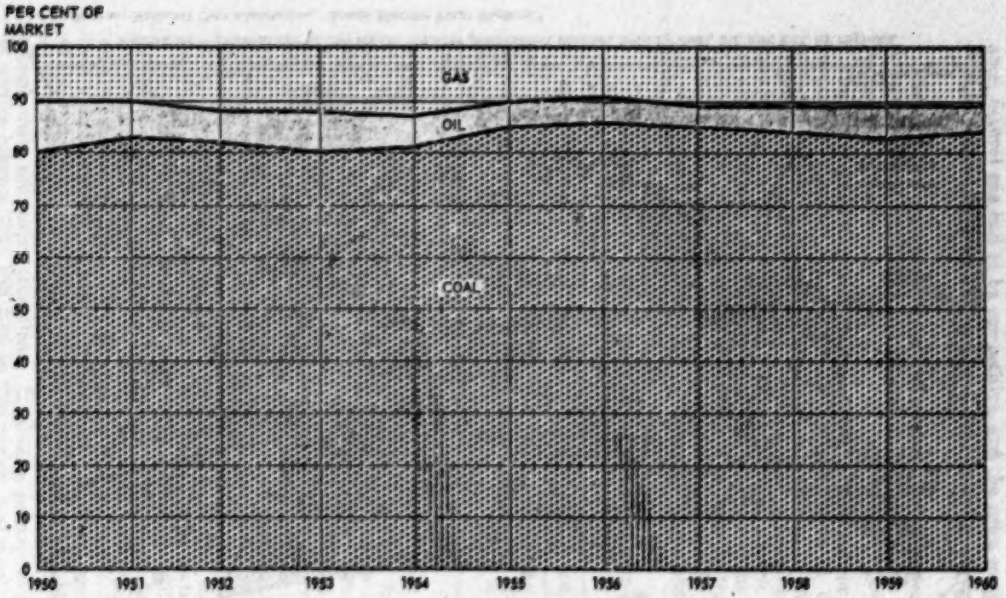


FIGURE 95.—Proportions of coal, oil, and gas used for electric power generation in the "coal-competitive area," defined by the National Coal Association. See figure 93.

Source: National Coal Association, Steam-Electric Plant Factors, 1956, 1959, and 1960.

combined market share of oil and gas in the coal competitive area in 1960 was equivalent to 33 million tons of coal out of a total market equivalent to 207 million tons. Since 1952 oil and gas have increased their joint participation in this market by the equivalent of 8 million tons of coal, coal itself by 70 million tons.

Most discussions about interfuel competition relate to the eastern seaboard, with special emphasis on New England. In New England, gas pipelines reach no farther than southern New Hampshire; Maine and Vermont have no natural-gas supply at all. Oil is the dominant fuel in Maine, New Hampshire, and Massachusetts (to where coal haulage is longest); coal is dominant in Vermont, Connecticut, and Rhode Island. With so little gas entering, the competition in this area is mainly between coal and residual fuel oil.

A relatively small amount of gas is used for power generation in the Ohio-Indiana-Illinois region as a result of the prime considerations of price and availability of underground storage. In the Southwest, on the other hand, almost all steam-generated electric power has been from gas, but here and there this is changing. The new Cholla plant of the Arizona Public Service Co. is designed for pulverized coal alone, and its Four Corners plant, being built, is a mine-mouth plant also designed for pulverized coal only. The Public Service Co. of New Mexico too is planning a mine-mouth plant.

The operations of the Consolidated Edison Co. of New York present a typical case history. This company is the largest utility company in the Metropolitan New York area. Its present steam-generating capacity is equivalent to 10.6 million tons a year. The company estimates that its fuel requirement in 1962 will be supplied 51 percent by coal, 25 percent by oil, and 24 percent by gas. In addition, the equivalent of 1 million tons of coal will be provided by the company's nuclear facilities and by hydropower from the Niagara Mohawk System. Also Consolidated Edison is constructing a new station at Ravenswood, Long Island, which will be equipped to burn only gas and oil. The company [1] reports that it expects to save $30 million in coal-burning equipment, cinder-catchers, coal and ash-handling equipment, water-frontage improvements, and other items realted to the use of coal. The planned energy consumption is the equivalent of about 1,500,000 tons of coal a year. On April 1, 1962, Consolidated Edison began to switch its East River plant from coal to residual oil in order to control air pollution, having been restricted in the use of gas (the *Transco* case). In early 1963, when the conversion is complete, 40 percent of boiler capacity will be oil fired. The converted boilers burned 450,000 tons of coal annually.

Figure 96 shows the prices (in cents per million B.t.u.) of coal, oil, and gas as reported by Consolidated Edison from 1950 to 1961.

An argument advanced by the coal industry regarding competition between residual oil and coal is that the effect upon the price of coal ripples out through the entire U.S. coal market. The producers in the northern Appalachian region who sell to east coast consumers sell also to consumers in other directions. These other customers will not pay more f.o.b. the mine than anyone else. Producers in other regions then tend to adjust their prices in order to hold their markets against the competition of the Appalachian producers, and so on market area by market area. For example, whenever a producer in Pennsylvania is

[1] Letters dated May 21 and June 26, 1963.

forced to cut his price on coal sold to customers in New York and Philadelphia, the same price concessions are demanded by customers in western New York, Ohio, Michigan, or Minnesota, and the concessions are quickly echoed in the coalfields of Ohio, Indiana, and Illinois.

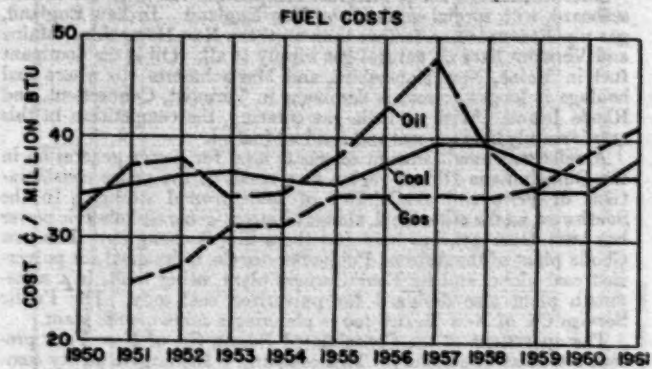


FIGURE 90.—Fuel prices paid by Consolidated Edison Co., 1950–60.

General industrial

General industrial fuels are used for process heat, boiler heat, or as raw materials.

The general industrial market has many of the aspects of power generation, with the major difference that the average industrial customer uses less fuel than the average powerplant, and that the capital charges are probably more prominent in relation to fuel costs. Also, these general industrial consumers are usually less able to achieve the efficiencies that power companies obtain with their larger boilers. For these reasons the general industrial market is probably not quite as sensitive to what it pays for fuel. Nevertheless, fuel costs together with consumer preference and technology have resulted in a significant decline in coal sales in the general industrial market in the postwar period, though not much of a decline has occurred since the mid-1950's. (See fig. 90.)

Because the data are so sketchy, it is not always possible to assign to competition a loss that one fuel may sustain at a given time, or that another may gain. One factor is the tendency in the industry toward purchasing power from electric utilities rather than generating one's own. In 1947, for example, industry generated about 30 percent of its electric power requirements, but less than 20 percent in 1960. There thus occurred a transfer of fuels from the industrial sector to the utility sector. This trend would be expected to be pronounced in the areas most heavily industrialized.

From 1954 to 1958—the latest 2 census years—coal's share of manufacturers' heat and power market (which excludes metallurgical coal and all raw material uses of the fuels) rose from 34 percent to 36 percent, oil's share rose from 11 percent to 16 percent, and that of gas declined from 56 to 48 percent. In the area east of the Mississippi

coal's share rose from 41 to 51 percent. In region IV oil's share rose from 10 to 15 percent, while in region IX it fell from 55 to 30 percent. Gas' share declined substantially in region II, but increased in region III. A different time span might show different relationships; both 1954 and 1955 were recession years, but no more satisfactory data are available.

With respect to the competitive prices involved, there is very little information. Data from the 1958 Census of Manufacturers show that in the manufacturers' heat and power market the delivered price of coal averaged 37 cents per million B.t.u. and that gas averaged 28 cents. East of the Mississippi both prices averaged about 37 cents. Available figures for oil apply to too great a variety of products to yield anything meaningful.

According to the American Gas Association, the average price of gas sold to industrial users rose by almost 60 percent from 1950 to 1960. With respect to interruptible sales alone, which is a point of common discussion, data for comparison are not available on prices of coal and oil that compete with this type of sale (about two-thirds of which is for boiler fuel, and one-third for process heat). However, in those regions where coal is a significant factor the average cost of coal to electric powerplants is below the equivalent average cost of interruptible gas.

Since 1949, residual fuel oil imported into the east coast has ranged between 17 million and 49 million tons of coal equivalent a year. This enters into both the general industrial and utility markets. Under the 1969 quota it was entering at an annual rate of 49 million tons of coal equivalent, of which 10 million tons was used in ships' bunkers in foreign trade and would not be supplied by domestic oil. If the importation were stopped, coal, natural gas, and domestic petroleum products would supply roughly an equivalent amount, in unknown proportions. Any additional coal produced would come largely from Pennsylvania, West Virginia, or Virginia, but its entry would be slow because many installations are equipped to burn only one fuel; the loss would be borne by the Netherlands West Indies and Venezuela. Any additional gas would probably come from Louisiana and Texas.

TRANSPORTATION

The table below gives the latest reliable data on the use of fuel in transportation. According to it, oil accounts for over 90 percent of the total. Figure 90 shows the rate at which coal has dropped out of this market, from 110 million tons in 1947 to 2 million in 1960.

Oil may not necessarily maintain its preeminent position in this market. The electrification of railroads and liquification of coal both provide potential threats.

TABLE 42.—*Fuels used in the transportation industry, 1955*

[Trillion B.t.u.]

	Direct	Via electricity	Total	Percent
Coal	333	24	357	4.8
Oil and NGL	7,430	5	7,435	91.9
Gas	234	12	246	3.3
Total	8,017	71	8,088	100.0

Source: Schurr and Netschert.

PART V. UNCONVENTIONAL SOURCES OF ENERGY

Unconventional sources of energy are sources other than coal, oil, gas, wood, falling water, and now atomic energy. They include the sun's heat and light (solar energy), the wind (windpower), the tides (tidalpower), the heat within the earth, the thermal energy of the sea, bacterial life processes, and new exotic forms of generating electricity. The subject is included here for the sake of completeness, and the treatment is brief.

SOLAR ENERGY

The traditional commercial uses of solar energy are in the evaporation of brine in open pans for recovery of the salt, in the drying of fruit, and to hasten plant growth in greenhouses. The attention to unconventional uses is with the intent of trying to capture and apply the heat to various other ends, depending on temperature desired, and for direct conversion into electricity. Low-temperature uses are many, including the heating of water (which then may be used for home heating, for example) and in the conversion of saline to fresh water. Solar conversion of saline water is one of the techniques being investigated by the Office of Saline Water of the Department of Interior. At higher temperatures the heat may be applied to furnaces or to run engines of various types—steam engines, for example—either for direct transmission of power or for generation of electricity.

The heat of the sun is caught by a reflector and focused where wanted. The focused beam can achieve temperatures of thousands of degrees, high enough to melt metals, and solar heat already has been used in experimental metallurgy.

Focused sunlight can be used in thermoelectric devices (creating an electric current by heating the junction of two dissimilar conductors). (See below.) A number of satellites are powered by photovoltaic cells (the kind used in photographic exposure meters), which are solid-state electronic devices that convert light into electricity. Other specialty uses are possible.

WINDPOWER

Windmills for pumping water are well-known devices, and the reference to windpower as an unconventional source of energy is to its widespread use, and mainly to produce electricity. Electric generators run by windmills are in commercial production or operation in Denmark, Canada, France, Germany, South Africa, the Soviet Union, the United States, the United Kingdom, and elsewhere. Interest is expanding.

Thousands of generators of capacity of 3 to 4 kilowatts are in use in different parts of the world. A 100-kilowatt wind-driven generator has been operating successfully in Denmark for several years, and a 100-kilowatt generator has been installed also in the Isle of Man.

A 640-kilowatt generator has been tested in France. All these larger units are designed to feed energy into existing alternating-current networks.

TIDAL ENERGY

Tidal energy is contemplated as a source of hydroelectric power wherever tides are abnormally high. The tides in the Passamaquoddy area of the Bay of Fundy have been viewed in that light for some time. A 235,000-kilowatt plant was proposed in 1924, and $7 million were spent on the project by the United States in 1935–36. The latest interest is expressed in a report of the International Joint Commission dated April 1961. A tide-driven prototype plant generating 9,000 kilowatts was inaugurated successfully in France (at Saint-Malo, Brittany) on November 4, 1959; interest is alive in a project on the La-Rance River nearby that will have a capacity of 240,000 kilowatts, planned to deliver 97,000 kilowatts of winter power and 195,000 kilowatts of peak power. The U.S.S.R. is said to be interested in several projects, including one at Mezen on the White Sea.

THERMAL ENERGY OF THE SEA

Proposals have been advanced to make use of the difference in temperature between the surface water of the sea, heated by the sun, and the colder water below. Again, French engineers have been the leaders. The interest is based on the thermodynamic principle that heat can be converted to mechanical energy when there exists a difference in temperature between two heat sources. The temperature differential is analogous to head in a waterfall. The power that may be produced is proportional to the square of the difference, so that even small differences—if they are not too small—can be utilized. In certain ocean expanses, the temperature difference is consistently great enough, about 20°C., for this purpose.

GEOTHERMAL HEAT

Reservoirs of underground heat underlie the volcanic regions of the world. They are commonly identified by the presence of hot springs and fumaroles, and the heat can be withdrawn and used either in the form of hot water or steam under pressure. If the natural steam has sufficient volume, temperature, and pressure, it can be directed through a turbine to drive an electric generator, or the heat can be used to generate steam. Geothermal plants in Italy had a capacity of 274,000 kilowatts in 1954 and operated 300 days a year to provide 2 billion kilowatt-hours annually. A 275-kilowatt plant is in operation in the Katanga mining region. In Japan, New Zealand, Mexico, and Chile either plans have been made, designs drawn, or construction is in progress. The Pacific Gas & Electric Co. in 1959 placed a 12,500-kilowatt plant in operation at Sonoma, Calif., north of San Francisco, and has since expanded the capacity.

The steam fields of Iceland have long been used for heating purposes.

THE BACTERIAL FUEL CELL

The fuel cell, discussed more fully below, is included here as an unconventional source of energy because of the demonstration within

the past 2 years of a bizarre cell fueled with a common and harmless species of bacteria. The bacteria occur in and feed on almost any kind of organic matter and generate electricity in doing so: corncobs, peanut shells, the waste in polluted rivers. They occur everywhere, including abundantly in the sea. Cells generating 2 volts have been built, and model devices have been operated. An intriguing aspect is that the bacteria clean up organic waste matter in the process of converting it into electricity; a papermill, for example, might get its energy from its waste products and at the same time avoid polluting the river running by its door.

The bacteria fuel cell was discovered by a scientist of the Geological Survey—i.e., it is the result of Government research.

EXOTIC WAYS OF GENERATING ELECTRICITY

Five unconventional conversion methods are attracting considerable attention in scientific laboratories:

Thermionic converters, in which electrons "boiled out" of a hot metal surface are used to generate electricity. The device may appear soon in solar-power generators in satellites. One of the most hopeful applications, though at least a decade away, is in atomic powerplants, where the thermionic devices would use heat that is otherwise wasted in the steam-cycle. Such units would give added efficiency to power stations, augmenting the steam-turbine generator.

Thermoelectric generators, defined above. There is considerable talk about specialty applications but not much optimism about the generation of large amounts of economic power. Known materials do not offer any hope of efficiency above 10 percent, but the operation is simple and the materials would last indefinitely. Converse to the generation of electricity by heat, the passage of an electric current heats the conductor and, oddly enough, passage of the current in the opposite direction cools it. Thermoelectric cooling devices are already appearing commercially.

Magnetohydrodynamic generators (MHD), which use a hot steam of plasma (ionized gas) instead of a copper wire as the conductor. Few ideas of modern times have posed tougher materials problems. Some observers feel that there is little if any hope of finding an electrode material that can withstand the required temperatures for anything like the period of time that would make such devices economic for large powerplants, which is the field in which the application is usually talked about. Few specialty applications have been suggested. The idea is to combine MHD with conventional systems, to achieve higher efficiencies. Most observers judge that MHD is the least promising of the schemes discussed here.

Fuel cells, batterylike devices in which a chemical substance reacts to produce electricity without flame, smoke, or noise. In the fuel cell one of the chemicals is oxygen (pure or in the form of air), the other is hydrogen or an organic material. The chemicals are fed continuously into the cell, which is able therefore to generate electricity continuously and indefinitely.

The fuel cell is still an experimental idea, although close to some special commercial applications. Experimental fuel-cell tractors and forklift trucks have been tested. A small number of fuel cells are

being delivered to the Armed Forces; the first application might be for a backpack generator that can operate frontline electronic gear. Such specialty applications, where convenience is more important than cost, could become important soon. Bulk power generation (central station plants) would require a cell that operates on cheap hydrocarbon fuels (coal, oil, natural gas). Some experts believe such cells may be developed within a decade; others believe this is far too optimistic. The fuel cell for the home or for automotive use seems a long way off. In general there is more optimism about the fuel cell than about any of the other new energy conversion schemes.

Comparison of Coal-Fired and Nuclear Power Plants For the TVA System

• • •

Conclusions

It is evident from the results of the evaluation that the nuclear alternatives have a decided advantage over the coal-fired plant and that either a BWR or a PWR nuclear plant at Browns Ferry would be a decided economic choice over a coal-fired plant at Cumberland City. Comparing the present values of the investment cost plus the total production costs for the first 12 years of plant operation of each of the alternatives indicates the amount of this saving is $21.9/kw for a PWR plant and $35.6/kw for a BWR over the coal-fired plant. Although the capacities of these plants are not identical, an indication of the magnitude of this saving in total dollars is helpful in appraising the alternatives. The dollars per kw saving above amounts to about $43 million if a PWR is installed instead of a coal-fired plant, and $76 million, if a BWR is installed. These represent annual savings of about $8 million for the BWR and $5 million for the PWR. In addition, the nuclear plants have firm prices covering all the equipment (for 1970 and 1971 operation), and firm prices for a longer period on the fuel supply.

There are no technical or other reasons to believe that either a fully operable plant of the BWR or PWR type cannot be successfully licensed and built. The choice then lies between the BWR and PWR. The BWR plant has a $13.7/kw economic advantage over the PWR; based on the capacity of the BWR plant the saving over the PWR has a present value for the first 12 years of about $29 million, or about $3 million annually, for the two-unit plant. In addition to this evaluated advantage over the PWR are GE's offers of a capacity guarantee, an operating assurance, better fuel cancellation terms, and a longer firm fuel supply.

* * *

Contract 41-T3 10-17-62 DX 104

Bart,

Enclosed is a draft of a letter which incorporates the basic information that I would like to have in your request for adding the Fidelity Mine as a source under this contract.

We will need the original and one copy of an executed Producer's Statement on the Fidelity Mine. The information that I have filled in on the form enclosed came from the statements that are on file for this source under Contract 38-T12.

You can probably improve on the language that I have suggested for the letter, but the idea is the thing I wanted to be sure was incorporated.

I certainly appreciate your cooperation in working with me to bring this matter to its proper conclusion. I feel that the contract is good for both of us and that we will certainly reap mutual benefits from it.

Tilman.

DEFENDANT'S EXHIBIT 105

October 18, 1962

Mr. E. C. Hill, Chief
Coal Procurement Branch
TENNESSEE VALLEY AUTHORITY
1010 Georgia Avenue
Chattanooga, Tennessee

Subject: CONTRACT 63P-41-T3—Coal for Shawnee Steam Plant

Dear Mr. Hill:

Confirming our telephone conversation on October 17, 1962, we would appreciate being authorized to begin deliveries on the above contract effective October 22, 1962, rather than on the November 1, 1962, date which was established as the initial date when this contract award was made last week. Deliveries during October will be at the rate of 9,000 tons per week and increase to 13,000 tons per week effective November 1, as now provided under the agreement.

We also request that beginning with initial deliveries and continuing until further notice, we be permitted to deliver 50 per cent of the contract weekly schedule requirements from the Fidelity Mine of our affiliated company, The United Electric Coal Companies. The size and quality of coal to be furnished from this source and other data pertinent to this operation are set out on the enclosed Producer's Statement which is provided in duplicate. It would be agreeable with us if you prefer to provide for a separate guaranteed analysis and billing price

per ton on this Fidelity coal so as to minimize quarterly adjustments for quality.

We will deeply appreciate your cooperation in the arrangement of these matters.

Sincerely yours,

FREEMAN COAL MINING CORPORATION

BARTON R. GEBHART
Vice President

BRG:AJ

TENNESSEE VALLEY AUTHORITY
Division of Materials
Coal Procurement Branch
Chattanooga, Tennessee

COAL CONTRACT SUPPLEMENT

To Freeman Coal Mining Corporation
300 West Washington Street
Chicago 6, Illinois

Supplement No. 1
Date October 25, 1962
Contract No. 63P-41-TJ
Plant Shawnee
Name of Mine Various

Attention: Mr. Barton R. Gebhart

This confirms agreement reached between you and J. C. Hill by telephone on October 17, 1962, regarding the initial date of contract shipments and authorization of a supplemental mine source under above contract. This also acknowledges receipt of your letter dated October 18, 1962.

Initial deliveries shall begin under this contract on October 22, 1962, and continue for a period of 120 months thereafter. The Fidelity Mine is authorized as a supplemental source for up to 50 percent of weekly schedule requirements.

Information pertinent to the supplemental source in accordance with the Producer's Statement furnished is as follows:

Producer	United Electric Coal Companies
Mine	Fidelity
Seam	No. 6 (Illinois)
Type of mine	Strip
Size & preparation	*
Shipping point	Du Quoin, Illinois
Via	IC Railroad
Consigned to	Shawnee Steam Plant

(a) *1-1/4" x 0 Scgs. (moisture allowance 3%)
(b) 6" x 0 Cr. to 1-1/4" x 0 - mixed with 1-1/4" x 0 Scgs. (moisture allowance 1%)
(c) 6" x 1-1/4" or int. sizes Cr. to 1-1/4" x 0 (moisture allowance none). All crushing after washing.

The guaranteed analysis for deliveries from the Fidelity Mine shall be as follows:

Total moisture	11.0%
Ash (dry basis)	11.1%
Sulphur (dry basis)	3.4%
Btu/lb. (dry basis)	12,653
Delivered heat content Btu/lb. (as received)	11,261
Btu/lb. (MAM free)	14,233

Effective October 22, 1962, the billing price TVA will pay for deliveries from the Fidelity Mine shall be $2.85 a ton f.o.b. rail cars, Du Quoin, Illinois. This change in price (to the nearest cent a ton) is correlative to the above change in the guaranteed analysis and the contract evaluated delivered cost of 16.00 cents a million

TENNESSEE VALLEY AUTHORITY
Division of Materials
Coal Procurement Branch
Chattanooga, Tennessee

COAL CONTRACT SUPPLEMENT

-3-

To Freeman Coal Mining Corporation

Supplement No. 1
Date October 25, 1962
Contract No. 632-41-73
Plant Shawnee
Name of Mine Various

Btu to the Shawnee Steam Plant (using a freight rate of $0.99 a ton). Your invoices should reflect the new billing price on shipments from the Fidelity Mine.

Separate samples shall be taken and separate Coal Quality Adjustment Reports will be issued each calendar quarter on receipts from the Fidelity Mine. The quarterly quality adjustment shall be applied to the billing price of the Fidelity Mine coal in the amount (calculated to the nearest cent a ton) necessary to preserve the delivered cost of 18.00 cents a million Btu at the Shawnee Steam Plant. The adjustment shall in no way be affected by subsequent changes in steam plant destination of the coal or in freight rates. (See contract Exhibit II for samples of calculations).

All other provisions of the contract remain unchanged.

Please complete the acceptance below and return the copy of this contract supplement to this office. You should retain the original for your file.

Accepted FREEMAN COAL MINING CORP.
Company

By B. P. Robinson

Title Vice-President

Date October 29, 1962

TENNESSEE VALLEY AUTHORITY

By D. B. Stair

D. B. Stair
Contract Agent

DX 107

CENTRAL STATION NUCLEAR POWER

UNITS OPERABLE, UNDER CONSTRUCTION, OR ON ORDER

Contract Awarded	Operating Utility & Plant	State	Reactor Supplier	Size (Gw-Net)	Est. Cost* (Millions)	Power Operation	Regulatory Status**	
1970	Cincinnati G. & E. Co. (Zimmer 1)1/	Ohio	GE	810	$ 197	1976	-	L30
	Georgia Pwr. Co. (Hatch 2)	Ga.	GE	786	206	1976	-	2SP
	Southern California Ed. (San Onofre 2)	Cal.	Comb	1,100	450	1976	-	440
	" " " (" " 3)	Cal.	Comb	1,100		1977	-	
	Virginia E. & P. Co. (Gn. Anna 2)1/	Va.	W	845	208	1975	-	L33
	(5 units)			4,641	$1,058			

1/ Considered a 1970 sale although the utility may consider the order to have been placed at the end of 1969.

See Other Notes on Page 3.

SUMMARY OF ORDERS BY YEAR OF CONTRACT AWARD

Contract Awarded	No. of Units Annual	No. of Units Cumulative	Capacity - Mw Annual	Capacity - Mw Cumulative
1953	1	1	90	90
1955	2	3	465	555
1956	1	4	175	730
1957	1	5	61	791
1958	3	8	130	921
1959	1	9	70	991
1962	2	11	685	1,676
1963	5	16	2,712	4,388
1965	7	23	4,361	8,809
1966	20	43	16,206	25,015
1967	31	74	25,935	50,950
1968	17	91	15,627	66,577
1969	7	98	7,139	73,716
1970 (3/31/70)	5	103	4,641	78,357

UTILITIES CONSIDERED LIKELY TO PLACE ORDERS IN 1970

Commonwealth Edison Co.
Consolidated Edison Co.
Eugene W. & E. Board
Jersey Central P. & L. Co.
Los Angeles D. W. & P.
Middle South Utilities
Pacific G. & E. Co.
South Carolina E. & G. Co.
Tennessee Valley Authority
Puerto Rico Wtr. Res. Auth.

AEC Division of Industrial Participation
March 31, 1970

-3-

CENTRAL STATION NUCLEAR POWER

UNITS OPERABLE, UNDER CONSTRUCTION, OR ON ORDER

Contract Awarded	Operating Utility & Plant	State	Reactor Supplier	Size (Net-Mwe)	Est. Cost* (Millions)	Power Operation	Regulatory Status**
1953	Duquesne Lt. Co. (Shippingport 1)	Pa.	W	90 1/	$ 80	1957	1/
1955	Commonwealth Edison Co. (Dresden 1)	Ill.	GE	200	$ 51	1960	0
	Consolidated Edison Co. (Indian Pt. 1)	N.Y.	B&W	265 1/	124	1963	0
				465	$ 175		
1956	Yankee Atomic Electric Co. (Yankee)	Mass.	W	175	$ 39	1961	0
1957	Pwr. Reactor Development Co. (Fermi)	Mich.	PRDC	61	$ 40	1970	0
1958	Pacific G. & E. Co. (Humboldt Bay)	Cal.	GE	68	$ 24	1963	0
	Philadelphia Electric Co. (Peach Bottom 1)	Pa.	GGA	40	20	1967	0
	Rural Cooperative Pwr. Assoc. (Elk River)	Minn.	AC	22 1/	14	1964	0
				130	$ 58		
1959	Consumers Pwr. Co. (Big Rock Pt.)	Mich.	GE	70	$ 25	1963	0
1962	Connecticut Yankee A. P. Co. (Conn. Yankee)	Conn.	W	575	$ 99	1967	0
	Dairyland Power Cooperative (LaCrosse)	Wisc.	AC	50	14	1969	0
				625	$ 113		
1963	Jersey Central P. & L. Co. (Oyster Creek 1)	N.J.	GE	530	$ 83	1969	0
	Los Angeles D. W. & P. (Malibu)	Cal.	W	462	92	1975	C/P
	Niagara Mohawk Pwr. Corp. (Nine Mile Pt.)	N.Y.	GE	500	151	1969	0
	Southern California Edison Co. (San Onofre)	Cal.	W	430	68	1967	0 1/
	Washington Pub. Pwr. Sup. Sys. (WPPSS)	Wash.	-	790	315	1966	
	(5 units)			2,712	$ 709		
1966	Boston Edison Co. (Pilgrim)	Mass.	GE	655	$ 130	1971	C
	Commonwealth Edison Co. (Dresden 2)	Ill.	GE	809	84	1970	0
	Consolidated Edison Co. (Indian Pt. 2)	N.Y.	W	873	126	1971	C/P
	Florida P. & L. Co. (Turkey Pt. 3)	Fla.	W	693	78 1/	1971	C
	Northeast Utilities (Millstone 1)	Conn.	GE	652	90	1970	C/P
	Public Ser. Co. of Colorado (Ft. St. Vrain)	Colo.	GGA	330	70	1972	C
	Rochester G. & E. Corp. (Robt. E. Ginna)	N.Y.	W	470	65	1969	0
	(7 units)			4,361	$ 805		
1966	Carolina P. & L. Co. (Robinson 2)	S.C.	W	700	$ 76	1970	C/P
	Commonwealth Edison Co. (Dresden 3)	Ill.	GE	809	82	1970	C/P
	" " (Quad Cities 1)	Ill.	GE	809	88	1970	C/P
	" " (" " 2)	Ill.	GE	809	82	1971	C/P
	Consumers Pwr. Co. (Palisades)	Mich.	CE	700	170	1970	C/P
	Duke Pwr. Co. (Oconee 1)	S.C.	BW	841	196 1/	1971	C
	" " (" 2)	S.C.	BW	885		1972	C
	Metropolitan Edison Co. (Three Mile Is.)	Pa.	BW	831	142	1972	C
	Northern States Pwr. Syst. (Monticello)	Minn.	GE	545	88	1970	C/P
	Omaha Public Pwr. District (Ft. Calhoun)	Nebr.	CE	457	120	1971	C
	Pacific G. & E. Co. (Diablo Canyon 1)	Cal.	W	1,060	154	1972	C
	Philadelphia Electric Co. (Peach Bottom 2)	Pa.	GE	1,065	163	1972	C
	" " (" " 3)	Pa.	GE	1,065	165	1973	C
	Public Ser. E. & G. Co. (Salem 1)	N.J.	W	1,090	168 1/	1972	C
	T. V. A. (Browns Ferry 1)	Ala.	GE	1,064	224 1/	1971	C
	" (" 2)	Ala.	GE	1,064		1972	C
	Vermont Yankee N. P. Corp. (Vt. Yankee)	Vt.	GE	514	133	1971	C
	Virginia E. & P. Co. (Surry 1)	Va.	W	788	165	1971	C
	" (" 2)	Va.	W	788	123	1971	C
	Wisconsin Michigan Pwr. Co. (Pt. Beach 1)	Wisc.	W	497	83	1970	C/P
	(20 units)			16,385	$ 2,424		

See Notes on Page 3

-3-

CENTRAL STATION NUCLEAR POWER

UNITS OPERABLE, UNDER CONSTRUCTION, OR ON ORDER

Contract Awarded	Operating Utility & Plant	State	Reactor Supplier	Size (Mwe-Net)	Est. Cost* (Millions)	Power Operation	Regulatory Status**
1967	Arkansas P. & L. Co. (Nuclear One)	Ark.	B&W	800	$ 132	1972	C
	Baltimore G. & E. Co. (Calvert Cliffs 1)	Md.	Comb.	845	124	1973	C
	" " " " 2)	Md.	Comb.	845	106	1974	C
	Commonwealth Edison Co. (Zion 1)	Ill.	W	1,050	208	1972	C
	" " " 2)	Ill.	W	1,050	198	1973	C
	Consolidated Edison Co. (Indian Pt. 3)	N.Y.	W	965	155	1973	C
	Duke Pwr. Co. (Oconee 3)	S.C.	B&W	887	83 3/	1973	C
	Duquesne Lig. Co. (Beaver Valley 1)	Pa.	W	852	109	1973	C/P
	Florida P. & L. Co. (Turkey Pt. 4)	Fla.	W	693	79 3/	1972	C
	" " " (Hutchinson Is. 1)	Fla.	Comb.	800	123	1973	C/P
	Florida Pwr. Corp. (Crystal River 3)	Fla.	B&W	889	140	1972	C
	Georgia Pwr. Co. (Hatch 1)	Ga.	B&W	786	101	1973	C
	Indiana & Mich. Electric Co. (D.C. Cook 1)	Mich.	W	1,054	} 235	1972	C
	" " " " 2)	Mich.	W	1,060		1973	C
	Jersey Central P. & L. Co. (Three Mile Is. 2)	N.J.	B&W	810	108	1974	C/P
	Long Island Lighting Co. (Shoreham)	N.Y.	Comb.	819	210	1973	C/P
	Maine Yankee A. P. Co. (Maine Yankee)	Me.	Comb.	790	101	1972	C
	Nebraska Pub. Pwr. Dist. (Cooper)	Nebr.	GE	778	127	1972	C
	New York State E. & G. Corp. (Nail)	N.Y.	W	838	146	(no data)	C/P
	Northern Indiana Pub. Ser. Co. (Bailly)	Ind.	GE	660	103	1976	C/P
	Northern States Pwr. Co. (Prairie Is. 1)	Minn.	W	530	} 105	1972	C
	" " " " 2)	Minn.	W	530		1974	C
	Northeast Utilities (Millstone 2)	Conn.	Comb.	828	179	1974	C/P
	Philadelphia Electric Co. (Limerick)	Pa.	GE	1,065	252	1975	C/P
	" " " " 1)	Pa.	GE	1,065	224	1977	C/P
	Public Ser. E. & G. Co. (Salem 2)	N.J.	W	1,090	148 3/	1973	C
	Sacramento Mun. Util. Dist. (Rancho Seco)	Cal.	B&W	918	138	1972	C
	T. V. A. (Browns Ferry 3)	Ala.	GE	1,065	150 3/	1973	C/P
	Virginia E. & P. Co. (No. Anna 1)	Va.	W	845	209 3/	1974	C
	Wisconsin Michigan Pwr. Co. (Pt. Beach 2)	Wisc.	W	497	3/	1971	C/P
	Wisconsin Pub. Ser. Corp. (Kewaunee)	Wisc.	W	527	109	1972	C
	(31 units)			25,935	$ 4,435		
1968	Carolina P. & L. Co. (Brunswick 1)	N.C.	GE	821	$ } 323	1974	C
	" " " " 2)	N.C.	GE	821		1975	C
	Consolidated Edison Co. (Yonkers 1)	N.Y.	GE	825	164	(no data)	C/P
	Consumers Pwr. Co. (Midland 1)	Mich.	B&W	1,115	221	1976	C/P
	" " " " 2)	Mich.	B&W	492	} 337	1973	C
	Detroit Edison Co. (Fermi 2)	Mich.	GE	858		1976	C/P
	Iowa Electric Lt. & Pwr. Co. (D. Arnold)	Iowa	GE	1,133	221	1973	C/P
	Pacific G. & E. Co. (Diablo Canyon 2)	Cal.	W	1,060	133	1973	C/P
	Pennsylvania P. & L. Co.	Pa.	GE	1,060	186	1974	C/P
	" " "	Pa.	GE	1,062	139	1975	C/P
	Portland General Electric Co. (Trojan)	Pa.	GE	1,062	150	1977	C/P
	Pwr. Auth. of New York (FitzPatrick)	Oreg.	GE	1,106	199	1974	C/P
	Pub. Ser. Co. of New Hampshire (Seabrook)	N.Y.	W	821	224	1973	C/P
	T. V. A. (Sequoyah 1)	N.H.	Comb.	860	186	(no data)	C/P
	" " " 2)	Tenn.	W	1,124	} 332	1973	C/P
	Toledo Edison Co. (Davis-Besse)	Tenn.	W	1,124		1974	C/P
	(17 units)	Ohio	B&W	872	201	1974	C/P
				15,627	$ 3,016		
1969	Alabama Pwr. Co. (Farley)	Ala.	W	829	$ 164	1975	C/P
	Cincinnati G. & E. Co. (Zimmer 1)	Ohio	W	810	197 3/	1975	C/P
	Duke Pwr. Co. (Lake Norman)	N.C.	W	1,100	} 372	1975	C/P
	" " " "	N.C.	W	1,100		1977	C/P
	Jersey Central P. & L. Co. (Oyster Crk. 2)	N.J.	Comb.	1,100	200	1976	C/P
	Pub. Ser. E. & G. Co. (Hope Creek Is. 1)	N.J.	GE	1,100	} 481	1975	C/P
	" " " " 2)	N.J.	GE	1,100		1977	C/P
	(7 units)			7,139	$ 1,414		
	TOTAL THROUGH 1969 (55 units)			73,714	$13,250		

*Figures indicate total construction cost, including land and land rights. Transmission plant, fuel, training, and AFDC excluded.

**O - Operating License, O/P - Operating License Pending, C - Construction Permit, C/P - Construction Permit Pending

1/ Limit of T-G capacity. Reactor power 135 Mwe.

2/ Includes capacity of fossil fueled superheater. Electric power from reactor only: Indian Point - 151 Mwe; Ella River - 16 Mwe.

3/ Operable - License not required.

4/ One-half total cost for two units.

5/ 70% of total cost for three units.

6/ 30% of total cost for three units.

1969 ANNOUNCEMENTS OF NEW STEAM-ELECTRIC PLANT ADDITIONS*

Operating Utility and Plant	Capacity, Mw		Power Operation
	Fossil	Nuclear	
Alabama Pwr. Co. (Farley)		829	1975
American Electric Pwr. Co.	1,300		-
" " "	1,300		-
" " "	1,300		-
Appalachian Pwr. Co.	1,300		-
Associated Electric Co-op (Springfield, Mo.)	600		1972
Cambridge Electric Lt. Co. (Canal 2)	300		-
Carolina P. & L. Co. (Roxboro 3)	720		1973
" " (Sutton)	420		1972
Central Hudson G. & E. Corp. (Roseton 1)	680		1972
" " " 2)	680		1973
Central P. & L. Co.	325		1974
Dayton P. & L. Co. (Stuart 4)	800		1975
Detroit Edison Co. (Monroe 4)	786		1973
Duke Pwr. Co. (Belews Creek 1)	1,144		1974
" " " 2)	1,144		1975
" " (Cliffside 5)	576		1972
" "		1,100	1977
" "		1,100	1979
Duquesne Lt. Co./Ohio Edison Co.	800		1975
" " " "	800		1976
Florida P. & L. Co. (Sanford 4)	398		1972
"	398		1972
Gulf Pwr. Co. (Crist 7)	500		1973
Houston Ltg. & Pwr. Co.	750		1973
Jersey Central P. & L. Co. (Union Beach 1)	400		1973
" " " " 2)	400		1974
Kentucky Utilities Co. (Ghent 1)	427		1974
Minnesota P. & L. Co. (Boswell 3)	350		1973
Mississippi Pwr. Co. (Watson 5)	505		1973
Mississippi P. & L. Co.	750		1975
New England Electric System	685		1973
New Madrid, Missouri (New Madrid 1)	600		1972
Northeast Utilities	402		1973
Northern Indiana Pub. Ser. Co. (Bailly 12)	560		1973
" "	560		1975
Orange & Rockland Utilities, Inc. (Bowline 1)	600		1972
Orlando, Florida (Indian River 3)	327		1973
Otter Tail Pwr. Co.	400		1975
Pacific P. & L. Co.	500		1974
" "	500		1975
" "	500		1976
Philadelphia Electric Co.	400		1974
Public Ser. Co. of Colorado (Comanche 1)	360		1973
Public Ser. Co. of Indiana, Inc.	800		1974
" " "	680		1975
Public Ser. Co. of New Hampshire	400		1974
Public Ser. E. & G. Co.		1,100	1976
" " "		1,100	1977
Puerto Rico Water Res. Authority	500		1974
" " " "	500		1975
Salt River Pwr. District (Navaho 1)	770		1974
" " " " " 2)	770		1975
" " " " " 3)	770		1976
Seattle City Light/Snohomish PUD		1,000	1979
Southern Calif. Edison Co. (Huntington Beach 7)	790		1973
" " " " 8)	790		1974
Tampa Electric Co.	434		1973
Texas Electric Ser. Co. (Permia Basin 6)	568		1974
Union Electric Co.	600		1975
" "	600		1976
Utah P. & L. Co.	330		1974
" "	500		-
" "	500		-
" "	500		-
" "	500		-
Total Each	37,040	6,229	
Total - %	86%	14%	
Total Fossil & Nuclear	43,269		

* Units under 300 Mw and gas-turbine installations are not included.

AEC Division of Industrial Participation
March 31, 1970

CENTRAL STATION NUCLEAR POWER

UNITS OPERABLE, UNDER CONSTRUCTION, OR ON ORDER

Power Operation	No. of Units Annual	No. of Units Cumulative	Capacity - Mwe Annual	Capacity - Mwe Cumulative
Thru 1965	-	7	-	880
1966	1	8	790	1,680
1967	3	11	1,045	2,725
1968	-	11	-	2,725
1969	4	15	1,500	4,225
1970	9	24	5,382	9,607
1971	11	35	7,892	17,499
1972	17	52	14,640	32,139
1973	16	68	14,214	46,353
1974	11	79	9,614	55,967
1975	9	88	8,082	64,049
1976	7	95	6,372	70,421
1977	5	100	5,417	75,838
1978	-	100	-	75,838
1979	-	100	-	75,838
No Completion Date	3	103	2,519	78,357

SUMMARY OF REACTOR ORDERS

	No.	Capacity Mwe	%
Babcock & Wilcox	12	9,288	12
Combustion Engineering	10	8,475	10
General Electric	39	31,091	40
Gulf General Atomic	2	370	1
Westinghouse	36	28,349	36
*Other	4	823	1
TOTAL (3/31/70)	103	78,357	100

* Farnl, Elk River, LaCrosse, HPR

SUMMARY OF ANNOUNCEMENTS OF NEW STEAM-ELECTRIC PLANT ADDITIONS

Announcements in	FOSSIL Mwe	FOSSIL %	NUCLEAR Mwe	NUCLEAR %	TOTAL
1965	15,908	73	6,009	27	21,937
1966	20,096	47	22,477	53	42,573
1967	32,320	55	26,460	45	58,780
1968	24,600	62	14,803	38	39,403
1969	37,040	86	6,229	14	43,269
(5 Year Total)	129,984	63	75,978	37	205,962

DEFENDANT'S EXHIBIT 108

No. N-2
Tel. 973-3446 (Info.)
973-5371 (Copies)

FOR IMMEDIATE RELEASE
(Tuesday, January 13, 1970)

JAN 14 1970

NOTE TO EDITORS AND CORRESPONDENTS:

Following is a brief status report on U. S. civilian nuclear power plants for the year 1969:

During the year, electric utilities made known plans for six nuclear power plants. In this period, the utilities ordered seven reactors (five for plants announced during the year and two for plants previously announced) with a total capacity of about 7,169,000 kilowatts.

In 1968, utilities made known plans for 17 nuclear power plants. They also ordered 17 reactors with a total capacity of about 15,630,000 kilowatts.

Status of all nuclear power plants, as of December 31, 1969

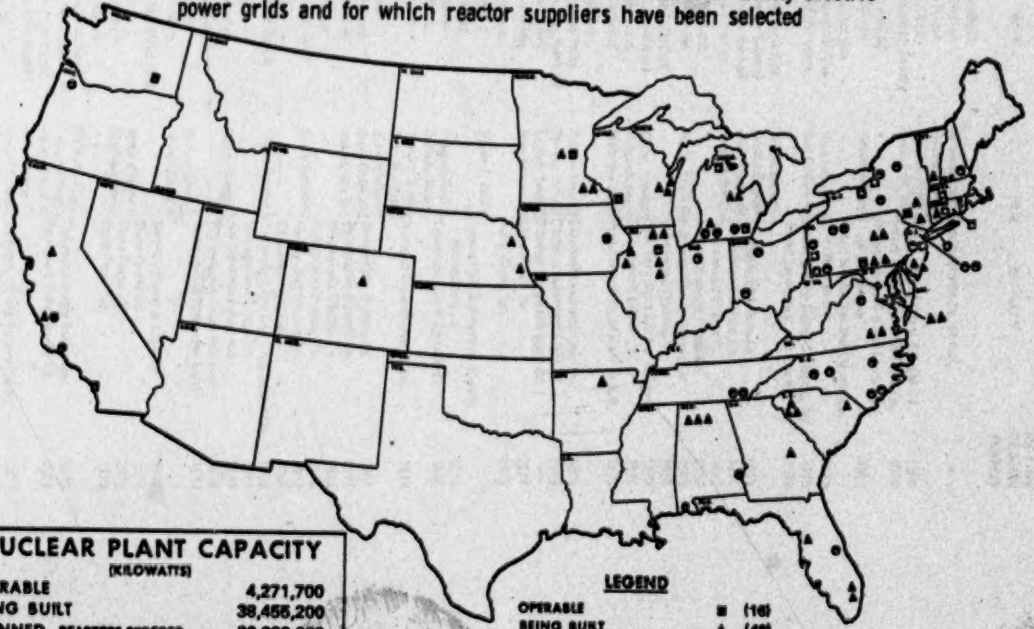
	kilowatts
16 operable	4,271,700
48 being built	38,455,200
34 planned (reactors ordered)	30,883,000
8 planned (reactors not ordered)	7,645,000
Total	81,254,900

Attached for your information is a map of the United States showing the location of all present and proposed civilian nuclear power plants for which reactor suppliers have been selected.

#

NUCLEAR POWER PLANTS IN THE UNITED STATES

The nuclear power plants included in this map are ones whose power is being transmitted or is scheduled to be transmitted over utility electric power grids and for which reactor suppliers have been selected



NUCLEAR PLANT CAPACITY

(KILOWATTS)

OPERABLE		4,271,700
BEING BUILT		38,456,200
PLANNED	REACTORS ORDERED	30,883,000
	REACTORS NOT ORDERED	7,645,000
	TOTAL	81,254,900

ELECTRIC UTILITY CAPACITY BY CONVENTIONAL MEANS AS OF OCT. 31, 1969: 323,610,431 KILOWATTS

LEGEND

OPERABLE	■	(16)
BEING BUILT	▲	(48)
*PLANNED (Reactors Ordered)	●	(34)

*8 more plants have been announced for which reactors have not yet been ordered.

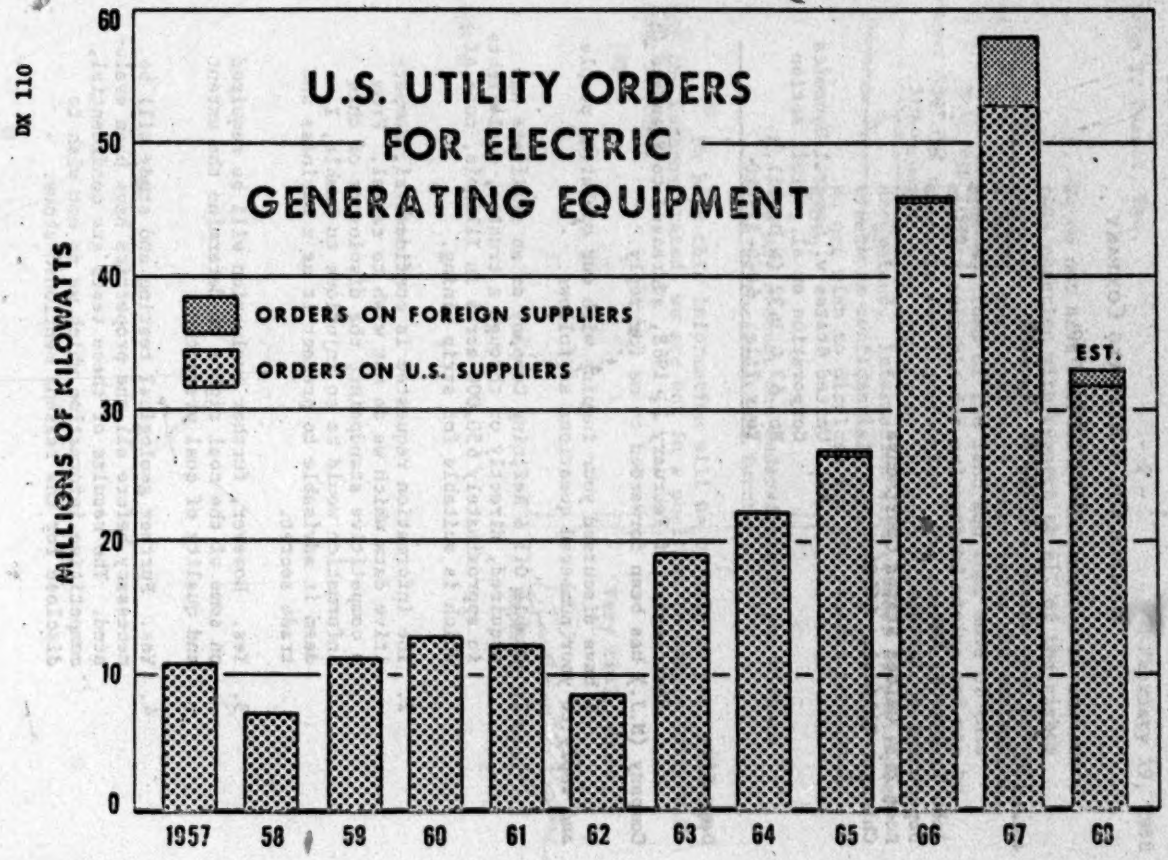
U.S. Atomic Energy Commission
December 31, 1969

1009

SITE	PLANT NAME	CAPACITY (Kilowatts)	UTILITY	INITIAL DESIGN POWER
ALABAMA				
Decatur	Browns Ferry Nuclear Power Plant: Unit 1	1,064,500	Tennessee Valley Authority	1971
Decatur	Browns Ferry Nuclear Power Plant: Unit 2	1,064,500	Tennessee Valley Authority	1972
Decatur	Browns Ferry Nuclear Power Plant: Unit 3	1,064,500	Tennessee Valley Authority	1972
Houston County	Joseph M. Farley Nuclear Plant	829,000	Alabama Power Co.	1975
ARKANSAS				
London	Arkansas Nuclear One	850,000	Arkansas Power & Light Co.	1972
CALIFORNIA				
Humboldt Bay	Humboldt Bay Power Plant: Unit 3	68,500	Pacific Gas & Electric Co.	1963
San Clemente	San Onofre Nuclear Generating Station	430,000	Southern Calif. Edison and San Diego Gas & Electric Co.	1967
Corral Canyon	Malibu Nuclear Plant: Unit I	462,000	L.A. Dept of Water & Power	1975
Diablo Canyon	Diablo Canyon Nuclear Power Plant: Unit 1	1,060,000	Pacific Gas & Electric Co.	1973
Diablo Canyon	Diablo Canyon Nuclear Power Plant: Unit 2	1,060,000	Pacific Gas & Electric Co.	1974
Clay Station	Rancho Seco Nuclear Generating Station	800,000	Sacramento Municipal District	1972
COLORADO				
Platteville	Ft. St. Vrain Nuclear Generating Station	330,000	Public Service Co. of Colorado	1972
CONNECTICUT				
Haddam Neck	Conn. Yankee Atomic Power Plant	575,000	Conn. Yankee Atomic Power Co.	1967
Waterford	Millstone Nuclear Power Station: Unit 1	652,100	Northeast Utilities	1970
Waterford	Millstone Nuclear Power Station: Unit 2	828,000	Northeast Utilities	1974
FLORIDA				
Turkey Point	Turkey Point Station: Unit 3	651,500	Florida Power & Light Co.	1971
Turkey Point	Turkey Point Station: Unit 4	651,500	Florida Power & Light Co.	1972
Red Level	Crystal River Plant: Unit 3	858,000	Florida Power Corp.	1972
Ft. Pierce	Hutchinson Island	800,000	Florida Power and Light Co.	1973
GEORGIA				
Baxley	Edwin I. Hatch Nuclear Plant	786,000	Georgia Power Co.	1973
ILLINOIS				
Morris	Dresden Nuclear Power Station: Unit 1	200,000	Commonwealth Edison Co.	1960
Morris	Dresden Nuclear Power Station: Unit 2	809,000	Commonwealth Edison Co.	1970
Morris	Dresden Nuclear Power Station: Unit 3	809,000	Commonwealth Edison Co.	1970
Zion	Zion Nuclear Plant: Unit 1	1,050,000	Commonwealth Edison Co.	1971
Zion	Zion Nuclear Plant: Unit 2	1,050,000	Commonwealth Edison Co.	1973
Cordova	Quad-Cities Station: Unit 1	809,000	Comm. Ed. Co.–Ia.–Ill. Gas & Elec. Co.	1970
Cordova	Quad-Cities Station: Unit 2	809,000	Comm. Ed. Co.–Ia.–Ill. Gas & Elec. Co.	1971
INDIANA				
Dunes Acres	Bailly Generating Station	515,000	Northern Indiana Public Service Co.	1976
IOWA				
Cedar Rapids	Duane Arnold Energy Center: Unit 1	545,000	Iowa Electric Light and Power Co.	1973
MAINE				
Wiscasset	Maine Yankee Atomic Power Plant	790,000	Maine Yankee Atomic Power Co.	1972
MARYLAND				
Lusby	Calvert Cliffs Nuclear Power Plant: Unit 1	800,000	Baltimore Gas and Electric Co.	1973
Lusby	Calvert Cliffs Nuclear Power Plant: Unit 2	800,000	Baltimore Gas and Electric Co.	1974
MASSACHUSETTS				
Rowe	Yankee Nuclear Power Station	175,000	Yankee Atomic Electric Co.	1961
Plymouth	Pilgrim Station	625,000	Boston Edison Co.	1971
MICHIGAN				
Big Rock Point	Big Rock Point Nuclear Plant	70,300	Consumers Power Co.	1963
South Haven	Palisades Nuclear Power Station	700,000	Consumers Power Co.	1970
Lagoona Beach	Enrico Fermi Atomic Power Plant : Unit 1	60,900	Detroit Edison Co.	1963
Lagoona Beach	Enrico Fermi Atomic Power Plant : Unit 2	1,126,000	Detroit Edison Co.	1974
Bridgman	Donald C. Cook Plant: Unit 1	1,054,000	Indiana & Michigan Electric Co.	1972
Bridgman	Donald C. Cook Plant: Unit 2	1,060,000	Indiana & Michigan Electric Co.	1973
Midland	Midland Nuclear Power Plant: Unit 1	492,000	Consumers Power Co.	1973
Midland	Midland Nuclear Power Plant: Unit 2	818,000	Consumers Power Co.	1974
MINNESOTA				
Elk River	Elk River Nuclear Plant	22,000	Rural Cooperative Power Assoc.	1964
Monticello	Monticello Nuclear Generating Plant	545,000	Northern States Power Co.	1970
Red Wing	Prairie Island Nuclear Generating Plant: Unit 1	530,000	Northern States Power Co.	1972
Red Wing	Prairie Island Nuclear Generating Plant: Unit 2	530,000	Northern States Power Co.	1974
NEBRASKA				
Fort Calhoun	Ft. Calhoun Station: Unit 1	457,400	Omaha Public Power District	1971
Brownville	Cooper Nuclear Station	778,000	Consumers Public Power District and Iowa Power and Light Co.	1972
NEW HAMPSHIRE				
Seabrook	Seabrook Nuclear Station	850,000	Public Service Co. of N.H.	—
NEW JERSEY				
Toms River	Oyster Creek Nuclear Power Plant: Unit 1	515,000	Jersey Central Power & Light Co.	1969
Toms River	Oyster Creek Nuclear Power Plant: Unit 2	1,100,000	Jersey Central Power & Light Co.	1976
Salem	Salem Nuclear Generating Station: Unit 1	1,050,000	Public Service Gas and Electric Co. of New Jersey	1972
Salem	Salem Nuclear Generating Station: Unit 2	1,050,000	Public Service Gas and Electric Co. of New Jersey	1973
Newbold Island		1,100,000	Public Service Gas and Electric, NJ	1975
Newbold Island		1,100,000	Public Service Gas and Electric, NJ	1977
NEW YORK				
Indian Point	Indian Point Station: Unit 1	265,000	Consolidated Edison Co.	1963
Indian Point	Indian Point Station: Unit 2	873,000	Consolidated Edison Co.	1971
Indian Point	Indian Point Station: Unit 3	965,300	Consolidated Edison Co.	1973
Scriba	Nine Mile Point Nuclear Station	500,000	Niagara Mohawk Power Co.	1969
Rochester	R.E.Ginna Nuclear Power Plant: Unit 1	420,000	Rochester Gas & Electric Co.	1969
Shoreham	Shoreham Nuclear Power Station	819,000	Long Island Lighting Co.	1975
Lansing	Bell Station	838,000	New York State Electric & Gas Co.	1978
Verplanck	Verplanck: Unit 1	1,115,000	Consolidated Edison Co.	1975
Scriba	James A. Fitzpatrick Nuclear Power Plant	821,000	Power Authority of State of N.Y.	1973
NORTH CAROLINA				
Southport	Brunswick Steam Electric Plant: Unit 1	821,000	Carolina Power and Light Co.	1975
Southport	Brunswick Steam Electric Plant: Unit 2	821,000	Carolina Power and Light Co.	1976
*		821,000	Carolina Power and Light Co.	—
*		1,100,000	Duke Power Co.	1977
*		1,100,000	Duke Power Co.	1979
OHIO				
Oak Harbor	Davis-Besse Nuclear Power Station	872,000	Toledo Edison-Cleveland Electric Illuminating Co.	1974
Moscow	William H. Zimmer Nuclear Power Station	840,000	Cincinnati Gas & Electric Co	1975
OREGON				
Rainier	Trojan Station	1,106,000	Portland General Electric Co.	1974
PENNSYLVANIA				
Peach Bottom	Peach Bottom Atomic Power Station: Unit 1	40,000	Philadelphia Electric Co.	1967
Peach Bottom	Peach Bottom Atomic Power Station: Unit 2	1,065,000	Philadelphia Electric Co.	1971
Peach Bottom	Peach Bottom Atomic Power Station: Unit 3	1,065,000	Philadelphia Electric Co.	1973
Limerick Township		1,065,000	Philadelphia Electric Co.	1975
Limerick Township		1,065,000	Philadelphia Electric Co.	1977
Shippingport	Shippingport Atomic Power Station: Unit 1	90,000	Duquesne Light Co.	1957
Shippingport	Beaver Valley Power Station: Unit 1	847,000	Duquesne Light Co.–Ohio Edison Co.	1973
Goldsborough	Three Mile Island Nuclear Station: Unit 1	831,000	Metropolitan Edison Co.	1971
Goldsborough	Three Mile Island Nuclear Station: Unit 2	810,000	Metropolitan Edison Co.	1973
*	—	1,052,000	Pennsylvania Power and Light	1976
*	—	1,052,000	Pennsylvania Power and Light	1977
SOUTH CAROLINA				
Hartsville	H.B. Robinson S.E.Plant: Unit 2	700,000	Carolina Power & Light Co.	1970
Seneca	Oconee Nuclear Station: Unit 1	841,100	Duke Power Co.	1971
Seneca	Oconee Nuclear Station: Unit 2	886,000	Duke Power Co.	1972
Seneca	Oconee Nuclear Station: Unit 3	886,000	Duke Power Co.	1973
TENNESSEE				
Daisy	Sequoyah Nuclear Power Plant: Unit 1	1,124,000	Tennessee Valley Authority	1973
Daisy	Sequoyah Nuclear Power Plant: Unit 2	1,124,000	Tennessee Valley Authority	1974
VERMONT				
Vernon	Vermont Yankee Generating Station	513,900	Vermont Yankee Nuclear Power Corp.-Green Mt. Power Corp.	1971
VIRGINIA				
Gravel Neck	Surry Power Station: Unit 1	780,000	Virginia Electric & Power Co.	1971
Gravel Neck	Surry Power Station: Unit 2	780,900	Virginia Electric & Power Co.	1971
Mineral	North Anna Power Station: Unit 1	845,000	Virginia Electric & Power Co.	1974
WASHINGTON				
Richland	N-Reactor/WPPSS Steam	790,000	Washington Public Power Supply System	1966
WISCONSIN				
Genoa	LaCrosse Boiling Water Reactor	50,000	Dairyland Power Cooperative	1969
Two Creeks	Point Beach Nuclear Plant: Unit 1	497,000	Wisconsin Michigan Power Co.	1970
Two Creeks	Point Beach Nuclear Plant: Unit 2	497,000	Wisconsin Michigan Power Co.	1972
Carlton	Kewaunee Nuclear Power Plant: Unit 1	527,000	Wisconsin Public Service Co.	1972

* Site not selected.

DX 110


U.S. UTILITY ORDERS
FOR ELECTRIC
GENERATING EQUIPMENT
ORDERS ON FOREIGN SUPPLIERS
ORDERS ON U.S. SUPPLIERS
MILLIONS OF KILOWATTS
60
50
40
30
20
10
0
1957
58
59
60
61
62
63
64
65
66
67
68
EST.

1011

HUMBLE OIL & REFINING COMPANY

HOUSTON, TEXAS 77001

February 19, 1968

RICHARD A. RYAN
GENERAL COUNSEL

60-0-37-920
DEPARTMENT OF JUSTICE
FEB 20 1968
DIVISION OF ANTITRUST

John T. Cusack, Esq.
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)
Your file: 60-0-37-920

Dear Sir:

Your letter of February 2, 1968, addressed to Standard Oil Company (N.J.) has been forwarded to me for reply.

I have discussed your inquiry with our operating people and reply to your numbered questions as follows:

1. Humble Oil & Refining Company or an affiliate has acquired, directly or through a trustee, coal rights in approximately 650,000 acres in Illinois, none of which is suitable for strip mining.

2. The information requested is confidential, competitive data which we do not wish to reveal. From a competitive standpoint, the disclosure of this information would be so injurious to Humble, I deem it advisable to protect it as a business and trade secret.

3. Yes. However, further evaluation will be required on some of the coal rights to determine the extent and quality of coal present.

4. Yes. Further geological testing and study will be necessary before all the properties have been evaluated. The results of these tests are confidential, competitive information which we do not wish to disclose for the reasons mentioned above.

5. We do not have sufficient information to answer this question with respect to all of the rights acquired. However, it appears, based upon present studies, that coal will occur below the surface of some portions of the land and that some of this coal is suitable for underground mining and may be suitable for liquefaction. The commercial feasibility of liquefying the coal has not yet been determined. Information with respect to particular tracts is confidential, competitive data which we do not wish to disclose for the reasons mentioned above.

6. You may contact the undersigned if you wish to discuss these matters further.

We hope this information will be of help to you, although for the reasons stated, we are not in a position to comply fully with your request.

Very truly yours,

Richard P. Ryan

RPR:ab

HUMBLE OIL & REFINING COMPANY
HOUSTON, TEXAS 77001

February 22, 1968

RICHARD P. RYAN
GENERAL COUNSEL

FEB 28 1968

Mr. Ron Futterman
Department of Justice
Room 2634 United States Courthouse
Chicago, Illinois 60604

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)
Your file: 60-0-37-920

Dear Sir:

Following your telephone call Tuesday afternoon I asked our operating people for a statement of our purpose in acquiring coal reserves in Illinois.

I found that they look upon these coal reserves as a long-range source of raw material that may be converted into hydrocarbon products, such as gasoline. We are also considering the possibility of making some sales of coal to utilities tributary to our reserves.

I trust this answers the question you raised in our telephone conversation.

Very truly yours,

Richard P. Ryan

Richard P. Ryan

RPR/nb

60-0-37-920
DEPARTMENT OF JUSTICE
FEB 28 1968
Chicago

DX 112

GENERAL DYNAMICS CORPORATION

Excerpt from Minutes of Meeting of Board of Directors

Held on September 30, 1966

7. United Electric Coal Companies - Purchase of Stock

The Chairman referred to the discussions at the last Board meeting regarding the purchase of additional stock of United Electric Coal Companies. He reported that, as authorized by the Board, the Corporation had acquired 48,400 shares of UEC from Material Service Employees Profit Sharing Trust at $50.50 a share, which represented the cost to the Trust of acquiring and carrying the stock.

The Chairman then stated that management had considered further the advisability of acquiring the remaining minority interest in UEC and, for various reasons, had concluded that the Corporation should proceed with a plan of acquisition at this time. He asked Mr. Sargent to present the management's views.

Mr. Sargent reviewed for the Directors the charts containing financial data on UEC which had been presented at the

last Board meeting, and noted the amounts that would be required on various assumptions to acquire the remainder of the UEC stock. He stated that the management still felt that the most direct method of acquiring the balance of the UEC stock was through a combination of a tender offer for an additional 170,000 UEC shares, which would bring the Corporation's holdings to slightly more than 90%, and a "short form" merger, available under Delaware law to a 90% holder, under which any remaining minority would be paid the fair value of their shares. He stated that under the "short form" merger provisions, UEC could be merged directly into the Corporation or into a new Delaware subsidiary to which the Corporation would first transfer its UEC shares, in either case by action of the Board of the parent. He stated that if the tender offer were a success the merger would be effected as promptly as possible and steps would be taken to provide management for UEC and to combine UEC and Freeman marketing and other administrative functions and staffs where efficiencies and cost reductions could be achieved. He stated, however, that in the first instance the UEC coal properties and contracts would be held separately from those of Freeman, most probably in the new Delaware subsidiary.

Mr. Sargent then reviewed the various considerations in support of the management view that the minority interest in UEC should be acquired and that Freeman and UEC should be combined as soon as possible, including a review of UEC's limited coal reserves and the resulting problems UEC had encountered in obtaining and keeping long term contracts, the ability of Freeman to provide a back-up of reserves over the long term and finally

the requirement for a new chief executive officer and other key personnel on which action should be taken promptly. He also reported that the New York Stock Exchange indicated its intention to delist UEC within the next few weeks. He stated that, in general, the combination of the two operations made good business and operating sense and would insure the ability of the enterprise to compete more effectively in its market. He stated further that, under all the circumstances, the Corporation's legal staff was not aware of any legal reason why the Corporation should not proceed with the plan.

The Directors discussed the matter of a tender offer price, in the course of which it was pointed out that it is normal in tenders of this kind to offer a premium over market of between 15% and 20%. Mr. Sargent then reviewed the market action of UEC stock over the last few months in which he noted that in July, when the possibility of a tender offer was first discussed, UEC was selling at 39-1/2, and that on August 3, the day before the meeting of the Board at which the tender offer was to be considered, the price of UEC had risen to 49. He stated that subsequent to the August meeting the price of the stock dropped sharply. The current market is about 42. Mr. Sargent then stated that, in his opinion, the Corporation should not, under present conditions, pay more than $50 a share on the tender offer, which provided a sufficient premium over the market. The consensus of the Directors was that $50 a share would be a proper offering price at this time.

Mr. Sargent answered questions by various Directors about the Corporation's cash position, the status of bank loans,

the effective rate of interest being paid, compensating balances, and all other factors relating to the Corporation's ability to finance the tender offer and the payout to the minority stockholders on the "short form" merger. The remaining Directors were polled and, in view of the business considerations detailed by management, all concurred in the recommendation to proceed with the tender offer.

Mr. Sargent stated that, as he had noted earlier, on a Delaware "short form" merger, the minority are entitled to be paid the fair value of their shares, exclusive of any element of value arising from the merger. In the first instance the Corporation or the Board of the new subsidiary would set the price, and any UEC share holder objecting to the price could seek appraisal under Delaware law. He stated that management did not have a final recommendation on the price to be offered on the merger, but that he was certain that it would not exceed $50 a share and might be less.

Mr. Sargent stated that it was proposed that Chase Manhattan Bank be designated as Tender Agent, that Georgeson & Co. be retained to assist on the tender offer and that a fee of 50 cents a share be paid to soliciting brokers. He then submitted to the meeting the proposed Invitation for Tender and Form of Tender and Assignment. He stated that these documents were substantially as submitted and reviewed at the August Board meeting, except that UEC earnings data for the first nine months of the year had been included. He stated that the documents had also been cleared with the New York Stock Exchange. The Chairman

directed that copies of the proposed Invitation for Tender and Form of Tender and Assignment be filed with the records of the meeting.

Mr. Sargent stated that, in addition to authorizing the tender offer and related action, it would be appropriate at this time for the Board to authorize the management, in its discretion, to organize a new Delaware subsidiary, to transfer the UEC stock to such subsidiary and to take such other action as would be required to effect the "short form" merger on the basis proposed. He stated that it was expected that the definitive plan for the combination of UEC and Freeman would be developed in time to permit its consummation by the end of the year.

After further discussion, on motion duly made, seconded, and unanimously carried, it was

RESOLVED, that the Corporation make an offer (hereinafter in these resolutions called the Tender Offer) to purchase shares of Common Stock of The United Electric Coal Companies (hereinafter in these resolutions called UEC) by inviting tenders for such shares at a price of $50 per share in the manner and on the other terms set forth in the instruments hereinafter in these resolutions approved; and further

RESOLVED, that the form, terms and provisions of the proposed Invitation for Tenders and the proposed Form of Tender and Assignment to be used in connection with the Tender Offer, copies of which have been submitted to this meeting, be, and hereby are, approved, with such changes therein as the President or the Vice President-Finance of the Corporation and Counsel for the Corporation may deem necessary or advisable and approve; and further

RESOLVED, that The Chase Manhattan Bank, N.A., be, and hereby is, designated as Tender Agent of

the Corporation for the purposes of the Tender Offer; and further

RESOLVED, that the President, the Vice President-Finance or the Secretary of the Corporation be, and each of them hereby is, authorized to

(a) engage The Chase Manhattan Bank, N.A., as Tender Agent of the Corporation in connection with the Tender Offer;

(b) extend the termination date of the Tender Offer to such date (not later than November 21, 1968) as they or any of them shall determine;

(c) pay commissions or fees to brokers responsible for soliciting tenders of shares of Common Stock of UEC;

(d) retain solicitors to assist in connection with the Tender Offer;

(e) deliver to the Tender Agent such instructions as they or any of them shall deem necessary or proper in connection with the Tender Offer (which instructions shall designate the persons authorized to act for and on behalf of the Corporation in connection therewith); and

(f) take all such other action as they or any of them shall deem necessary, proper or advisable in connection with the Tender Offer and the implementation of these resolutions or any of them; and further

RESOLVED, that the President, the Vice President-Finance, or the Secretary of the Corporation be, and each of them hereby is, authorized to take all such action, in the name and on behalf of the Corporation, as shall be necessary or proper to

(a) at such time as the Corporation shall own not less than 90% of the outstanding stock of UEC, cause UEC to be merged into the Corporation and, in connection therewith, set the terms and conditions of the merger (provided that the consideration to be paid for shares of UEC shall not exceed $50 a share) and execute and file a certificate of ownership and merger, all in accordance with Section 253 of the Delaware General Corporation Law;

(b) form a new corporation under the laws of the State of Delaware (hereinafter called New Corporation);

(c) execute, in the name and on behalf of the Corporation, a subscription agreement with New Corporation providing for the purchase by the Corporation of all the authorized capital stock of New Corporation for not more than $1000;

(d) as an alternative to the actions authorized pursuant to (a) above, transfer to New Corporation, as a capital contribution, all the shares of Common Stock of UEC owned by the Corporation (including, but not limited to, the shares of Common Stock of UEC to be purchased by the Corporation pursuant to the Tender Offer); and

(e) at such time as New Corporation shall own not less than 90% of the outstanding stock of UEC, cause UEC to be merged with and into New Corporation in accordance with Section 253 of the Delaware General Corporation Law upon such terms and conditions as said officers or any of them shall deem advisable, and in connection therewith to cause the Corporation to advance to New Corporation such funds as may be necessary to enable New Corporation to effect the terms of said merger.

THE UNITED ELECTRIC COAL COMPANIES DX 113

Special Meeting of the Board of Directors

October 9, 1959

A special meeting of the Board of Directors of

THE UNITED ELECTRIC COAL COMPANIES

was held at the office of the Company, 307 North Michigan Avenue, Chicago, Illinois, on the 9th day of October, 1959, at ten o'clock A. M., Central Daylight Saving Time, pursuant to waiver of notice.

The following directors were present:

John D. Ames
Dudley F. Jessopp
Frank F. Kolbe
John E. Martin
J. M. Morris

constituting a majority of the Board and a quorum.

Absent: Paul C. Clovis
J. Sterling Rockefeller
Henry A. Rudkin
George Spatta

The meeting was called to order by the President, Mr. Frank F. Kolbe, who presided throughout as Chairman of the meeting, and the minutes were recorded by Mr. G. H. Utterback, Secretary of the Company.

The Chairman suggested to the Board that a consideration of the minutes of the meeting of the Board of Directors held on September 21, 1959, be postponed to a later date.

The President then stated that certain large stockholders of the Company whose stock holdings aggregated approximately 50% of the Company's shares were requesting representation on the Board of Directors. He said that in the past he had offered representation

to them but that they had declined. He further stated that in order to meet such current request it would be necessary to eliminate five members of the present Board. He stated that the members of the present Board had agreed among themselves that Messrs. Frank F. Kolbe, J. M. Morris, John D. Ames and Dudley F. Jessopp should remain on the present Board, and that Messrs. Frank Nugent, Milton Falkoff, Reuben Thorson, Irving Crown and Barton R. Gebhart should be the other five nominees to be suggested by the management, and that a proxy statement should be issued by the management to solicit proxies for the election of such nine suggested nominees.

Thereupon, on motion duly made by Mr. Jessopp, and duly seconded by Mr. Ames, it was unanimously

RESOLVED, that the action taken by this Board of Directors at its meeting held on July 10, 1959, authorizing the Secretary of this Company to mail to stockholders of record on September 30, 1959, a notice and proxy statement in the forms adopted at said meeting and a proxy naming Messrs. Rudkin, Ames and Kolbe as proxies therein, be and the same hereby is rescinded.

FURTHER RESOLVED, that the Secretary of this Company be and he hereby is authorized and directed to cause the Transfer Agent for the common stock of this Company to mail as soon as reasonably possible after the date of this meeting, in accordance with the By-laws of this Company and the laws of the State of Delaware, to all stockholders of record as of the close of business September 30, 1959, addressed to them at their respective addresses as they appear on the books of this Company, a notice and proxy statement in substantially the following forms:

EXCERPTS FROM MINUTES OF
MEETINGS of May 13, 1960

The Chairman brought up for discussion the Company's ownership in McDonough and Schuyler Counties. At July 31, 1959 the Company owned or had contracts to purchase 2,529.10 acres of coal containing an estimated 8,976,117 tons and as of this date these figures have been increased to 3,339 acres of coal containing 11,530,000 tons. Inasmuch as the development of this field is probably some ten years in the future, it was decided not to pursue an aggressive purchasing policy in that area, but only to acquire acreage which might become available at not to exceed normal farmland prices in this area.

EXCERPT FROM MINUTES OF
MEETING OF JULY 15, 1960

Mr. Hepburn was invited into the meeting and, referring to a map that displayed the western part of Illinois, explained the Company's plan for acquiring #2 coal reserves in McDonough and Schuyler Counties where some 10,000,000 tons are already held in reserve. He stated that about a year ago a mining feasibility study was made of the property. A study of County records discloses that coal land options are being taken by two or three other companies. It was decided to review and revise the feasibility study to re-examine the advisability of pursuing a more active optioning program in the area.

than for any previous month. All mines were in good physical condition, with Fidelity being particularly improved by the new location with lower ratio and better stripping conditions in general. Banner Mine produced 38,47h tons and changes in the washing plant are still in progress.

Increased sales were due largely to greater purchases by power companies, particularly Commonwealth Edison and Illinois Power.

Some additional strip coal found at Mary Moore Mine, while of higher stripping ratio, will make it possible to keep the mine in operation for another 6 or 8 months and this is being considered.

The President stated that the Company is continuing to take options and leases on coal in the Beaucoup Field, acting as agent for the Aluminum Company of America. At a recent meeting officials of Alcoa indicated they planned to make the next expansion so as to use the coal reserve in Beaucoup Field. The total reserve is considerably greater than the 100 million tons allocated as a proper backlog for aluminum production and the officials expressed an interest in the possible development of a coal mine in the area prior to the need for an aluminum plant, the coal so produced to be sold in the industrial market when and if such a demand is forthcoming. Mr. Nugent stated that the engineers for Freeman Coal Mining Company could make a feasibility study for such a project when necessary.

There being no further business, on motion duly made by Mr. Jessopp, and duly seconded by Mr. Morris, the meeting was adjourned.

[illegible]
Secretary

(c) To consult with the Auditors regarding the scope of the audit to be made by such Auditors and to determine other services to be rendered by such Auditors with respect to such audit and other affairs of the Company.

(d) From time to time to advise this Board in respect of the matters herein covered, and

(e) To exercise such other powers as from time to time shall be delegated to it by the Board and as shall be necessary or proper to make effective the provisions of this resolution.

FURTHER RESOLVED, that Mr. Milton Falkoff be and he hereby is designated the Chairman of said Committee.

Upon motion duly made by Mr. Nugent, and duly seconded by Mr. Falkoff, it was unanimously

RESOLVED, that the proper officers of this Company, for and on its behalf, be and they hereby are authorized and directed to place a purchase order for a 70 cubic yard stripping shovel costing approximately $2,800,000.00; and

FURTHER RESOLVED, that said order be subject to cancellation within 30 days from this date by payment of such expenditures as the manufacturer may have made during that time and which cannot be recouped by him.

The Chairman stated because of conversations in the past in regard to possible consolidation with another coal company in this area it might be well to give some consideration to the subject.

Thereupon, on motion duly made by Mr. Gebhart, and duly seconded by Mr. Thorson, Messrs. Nugent, Falkoff and Morris not voting, it was

RESOLVED, that a committee composed of Messrs. Nugent as Chairman, Falkoff and Morris be and they hereby are appointed to serve at the pleasure of this Board to investigate and report to this Board concerning such consolidation.

Mr. Morris reported that Midwest Towing Co., Inc. for the first nine months of 1960 had a net income of $71,516.00 as against $44,235.00 for the corresponding period in 1959. Revenue for this

Excerpt FROM MINUTES OF MEETING OF MARCH 10, 19(

Upon motion duly made by Mr. Nugent, and duly seconded by Mr. Ames, the following preambles and resolution were unanimously adopted:

> WHEREAS, this Company on January 31, 1961 conveyed by Deed of Conveyance to James C. Sneed approximately 3½ acres of land in Hopkins County, Kentucky, the total consideration being $2,500.00; and
>
> WHEREAS, this Company completed its mining operations in this area some years ago and has no further use for the land;
>
> NOW, THEREFORE, BE IT RESOLVED, that the action of the officers of this Company, for and on its behalf, in executing said Deed of Conveyance to James C. Sneed, upon the terms as set forth above, be and the same hereby is in all respects approved, ratified and confirmed.

Upon motion duly made by Mr. Nugent, and duly seconded by Mr. Crown, the following preambles and resolution were unanimously adopted:

> WHEREAS, the proper officers of this Company on Jan. 27, 1961 entered into a coal lease with A. E. Gross and Margaret Gross covering the acquisition of minerals and the right to use the surface of approximately 12 acres of land in Vermilion County, Illinois, containing an estimated 95,600 tons of coal, the consideration being 27¢ per ton on the first 50,000 tons and 2¢ per ton on all over 50,000 tons, with advance royalty of $13,500.00, payable $7,000.00 on January 27, 1961, and $6,500.00 on August 1, 1961; and
>
> WHEREAS, at a stripping ratio of about 12 to 1 there is an estimated mineable tonnage of 38,300 which at the minimum royalty of $13,500.00 will cost 35.3¢ per ton; and
>
> WHEREAS, the acreage covered by the lease is necessary for proper continuous operation of the Mary Moore Mine;
>
> NOW, THEREFORE, BE IT RESOLVED, that the action of the officers of this Company, for and on its behalf, in entering into the coal lease with A. E. Gross and Margaret Gross, upon the terms and conditions as set forth above, be and the same hereby is in all respects approved, ratified and confirmed.

Mr. Nugent raised the question of the Company's reserves of mineable strip coal. After considerable discussion, upon motion duly made and duly seconded, it was

RESOLVED, that Messrs. Frank Nugent, John Morris and Irving Croun be and they hereby are constituted a committee to study the Company's situation in regard to reserves and to make recommendations to the Board as to how further reserves should be acquired.

FURTHER RESOLVED, that Mr. Frank Nugent be and he hereby is delegated to serve as Chairman of such Committee.

In view of the fact that March is the second month of the third quarter of the fiscal year, Mr. Morris brought up for discussion the Management Incentive Bonus for said fiscal year, and it was decided to defer discussion on this subject until the Board meeting scheduled for May 12th.

Mr. Morris also raised the question as to whether it would be advisable to transfer to a Chicago bank the Trusteeship of The United Electric Coal Companies Employees' Profit Sharing Trust fund from The Chase Manhattan Bank in New York. The question was referred to Messrs. Falkoff and Jessopp to report back to the Board at its May 12th meeting.

Mr. Falkoff, Chairman of the Audit Committee, requested that, in view of Mr. Thorson's absence, the report of Haskins & Sells detailed audit for the year ended July 31, 1960 be deferred until the Board meeting scheduled for May 12th. Mr. Falkoff further requested that the appointment of auditors for the year ending July 31, 1961 be deferred until the Board meeting on May 12th.

Mr. Falkoff also recommended that in the future the detailed audit report be made available to the Audit Committee before the annual statement is approved for printing.

There being no further business, on motion duly made by Mr. Anes, and duly seconded by Mr. Morris, the meeting was adjourned.

Secretary

EXCERPT FROM MINUTES OF MEETING ON MAY 12, 1961.

5. When and if requested by United Electric, Central Illinois Light Company will use coal from this storage pile and United Electric may curtail shipments to that extent, and when requested by United Electric, Central Illinois Light Company will put into storage additional coal, and by this arrangement, United Electric will be able to ship at times most beneficial to production and sales commitments.

6. On coal withdrawn from storage at request of United Electric, 7¢ per ton will be charged for such withdrawal.

Previous contract provided for re-opening of price and annual tonnage each year and this new contract gives firm commitment on price and tonnage.

NOW, THEREFORE, BE IT RESOLVED, that the action of the officers of this Company, for and on its behalf, in entering into such contract with Central Illinois Light Company, upon the terms and conditions as set forth above, be and the same hereby is in all respects approved, ratified and confirmed.

Mr. Hepburn was invited into the meeting and he and Mr. Nugent made a report on the Company's stripping reserves, using maps of Fulton County and Perry County, showing the Company's reserve areas in relation to the reserve areas of other strip companies, and it has been determined that the present reserves provide tonnage for continuing and growing production for about fifteen to twenty years. After discussion, upon motion duly made by Mr. Nugent, and duly seconded by Mr. Thorson, it was unanimously

RESOLVED, that the proper officers of this Company, for and on its behalf, be and they hereby are authorized and directed to begin at once an aggressive program to option for purchase and/or lease areas for test drilling in the North Canton and South Buckheart areas in Fulton County, and in the area in Perry County and Jackson County immediately south of the property acquired from Union Colliery Company.

The President reported to the Board that the new Bucyrus-Erie 70-yard stripping shovel was expected to be delivered and in operation at Fidelity Mine sometime late in the current year. This machine was

EXCERPT FROM MINUTES OF MEETING ON SEPTEMBER 8, 1961

The Chairman recalled that at a meeting of the Board held on July 14, 1961, a resolution was adopted authorizing the sale of a tract of 174 acres at Mary Moore Mine, said authorization subject to appraised value being obtained. The President then reported that an appraisal was obtained from a bank in Danville, Illinois, the value being set at $50,000 cash, or possibly $70,000 if sold by contract. Another appraisal was obtained from a Peoria appraisal firm which established the market value at $65,000. Since the price offered by the prospective purchaser, Miels C. Nielsen, was $85,000, the sale will be made to him, the purchase price to be paid as follows: $25,000 on signing of contract, $20,000 on each of the three next successive anniversaries, with interest on the unpaid balan at 5% per annum. However, Mr. Nielsen has agreed to purchase certain small tracts adjacent to the 174 acres that will eliminate the need for the Company to remove a haulage road and construct a private bridge, thus saving the Company an estimated $12,000 to $15,000, and consummation of the sale is contingent on Mr. Nielsen so doing.

In regard to the annual report for the fiscal year ended July 31, 1961, a draft of the letter to stockholders and a review of the results were read. It was pointed out by the President that in previous years only the coal deposits suitable for strip mining were included in our annual report. After considerable discussion it was decided that total coal deposits, both strip and underground, owned and controlled by the Company be shown in the annual report.

Upon motion duly made by Mr. Nugent, and duly seconded by Mr. Thorson, the following preamble and resolution were unanimously adopted:

> WHEREAS, the proper officers of this Company expended certain sums for equipment for use at its various mines as follows:

and

WHEREAS, the resolutions authorizing and/or approving said coal mining leases did not state that the acquisition of minerals included also "the right to use the surface" for such purposes as may be necessary in carrying on the strip mining operations; and

WHEREAS, such right is included in the coal mining leases;

NOW, THEREFORE, BE IT RESOLVED, that the wording of the resolutions authorizing and/or approving the six coal mining leases cited in the foregoing preamble should include the phrase "the right to use the surface", and that said phrase be and the same is hereby made a part of each of the cited resolutions the same as if it had been included in the original resolutions.

Mr. Nugent, Chairman of the Land Committee, referred to the coal land reserve position of the Company and the need to add to the operating life of present mines. The Company should continue to pursue a vigorous land acquisition program, not only at existing properties but at any location that might provide additional reserves and extension of mining activities. Management was again instructed to pursue this policy in acquiring additional coal lands suitable either for strip or underground mining.

Upon motion duly made by Mr. Crown, and duly seconded by Mr. Nugent, the following preamble and resolution were unanimously adopted:

WHEREAS, the proper officers of this Company expended the sum of $66,331.20 for the purchase of 1 Northwest 80-D coal loading shovel for use at Banner Mine;

NOW, THEREFORE, BE IT RESOLVED, that the action of the officers of this Company, for and on its behalf, in expending the sum of $66,331.20 for equipment as set forth above, be and the same hereby is in all respects approved, ratified and confirmed.

The Chairman advised that Midcontinent Barge Company, which Company is owned jointly with Truax-Traer Coal Company, desired to

purchase six 1,500 ton barges to take care of the increase in coal shipments on the Mississippi River. The Chairman further stated that Ingalls Ship Building Company has for sale six new barges, just recently completed, and of the type now in use by Midcontinent Barge Company. The purchase price of the Ingalls' barges is $60,000 per barge as compared with $61,500 and $63,900 per barge quoted by two other builders, neither of which could make immediate delivery.

At a meeting held on May 15, 1962, the Executive Committee authorized this Company, as a stockholder in Midcontinent Barge Company, to approve the purchase of the six barges, and that this Company purchase 1,000 shares of the no par value capital stock of the Barge Company for $150,000, the proceeds of such stock to be used toward completion of such purchase of barges. The 1,000 shares would continue to represent this Company's 50% share of the capital stock of such Barge Company.

After discussion, on motion duly made by Mr. Ames, and duly seconded by Mr. Thorson, the following preambles and resolution were unanimously adopted:

> WHEREAS, the Executive Committee of the Board of Directors of this Company at a meeting held on May 15, 1962, authorized the purchase of 1,000 shares of Midcontinent Barge Company's no par value capital stock, being the allocable portion of this Company's interest in such Barge Company, at a price of $150,000, on the determination that such $150,000, together with other available monies, will be used to purchase six 1,500 ton capacity barges by Midcontinent Barge Company, and also approved the authorization by this Company of making such purchase of barges; and
>
> WHEREAS, Midcontinent Barge Company has authorized the issuance of such shares to this Company; and
>
> WHEREAS, the Continental Illinois National Bank and Trust Company of Chicago and The Chase Manhattan Bank have agreed in writing that the expenditure of such money for the purchase of stock of Midcontinent Barge

EXCERPT FROM MINUTES OF MEETING ON JULY 13, 1962

The Chairman then presented a resolution approving this Company's action in signing a coal lease with United States Steel Corporation under which the life of Mary Moore Mine would be extended some four years.

After discussion, upon motion duly made by Mr. Crown, and duly seconded by Mr. Thorson, the following preamble and resolution were unanimously adopted:

> WHEREAS, the proper officers of this Company on June 28, 1962 entered into a lease with United States Steel Corporation covering the acquisition of all of the coal of the #7 vein and the right to mine the same on approximately 111 acres in Vermilion County, Illinois, containing an estimated 645,000 tons of the #7 vein, the consideration being 15¢ per ton royalty with minimum royalty of $60,000, payable $6,000 on January 10, 1963 and $6,000 per year on each of the succeeding nine anniversary dates;
>
> NOW, THEREFORE, BE IT RESOLVED, that the action of the officers of this Company, for and on its behalf, in entering into the coal lease with United States Steel Corporation, upon the terms and conditions as set forth above, be and the same hereby is in all respects approved, ratified and confirmed.

Upon motion duly made by Mr. Crown, and duly seconded by Mr. Thorson, the following preambles and resolution were unanimously adopted:

> WHEREAS, the proper officers of this Company on June 28, 1962 entered into a lease with United States Steel Corporation under the terms of which this Company acquired the right to mine all of the coal contained in the #7 vein on certain premises in Vermilion County, Illinois; and
>
> WHEREAS, Karl Zamberletti and Frances Zamberletti, co-partners doing business as V-Day Coal Company, on October 14, 1960 entered into a lease with United States Steel Corporation under the terms of which V-Day Coal Company acquired the right to mine all of the coal contained in the #6 vein on certain premises in Vermilion County, Illinois; and
>
> WHEREAS, the premises containing the #6 vein leased to V-Day Coal Company are identical with the premises containing the #7 vein leased to this Company; and
>
> WHEREAS, the #6 vein underlies the #7 vein, being separated from same by some 40 feet; and

4196

EXCERPT FROM UEC BD. MEETING MARCH 8, 1963

WHEREAS, Midwest Towing Co. Inc., owned jointly by this Company and another coal company, experienced a decrease in revenue received from its winter operations on the Ohio River largely because of bad weather and inoperable river conditions; and

WHEREAS, Midwest Towing Co. Inc. needs working capital to operate on the Mississippi River during the summer months;

NOW, THEREFORE, BE IT RESOLVED, that the proper officers of this Company be and they hereby are authorized to lend to Midwest Towing Co. Inc. an amount not to exceed $75,000 for a period of three months, secured by a promissory note executed by the proper officers of Midwest Towing Co. Inc.;

FURTHER RESOLVED, that should the amount lent to Midwest Towing Co. Inc. exceed $50,000, approval to make such loan will be obtained from the Continental Illinois National Bank and Trust Company of Chicago, representing the lending banks under this Company's loan agreement dated September 1, 1961.

Opening a general discussion on the question of mineable reserves the President stated that at Buckheart the total possible including present operating area, North Canton and South Buckheart would amount to some 46,600,000 tons, most of which have been acquired or optioned. At Cuba Mine possibly 1,500,000 tons of #6 are available although not yet acquired; possibly 3,500,000 to 5,000,000 tons of #2, some of which is under option, and all of which is high ratio stripping; making a possible estimated total of 7,000,000 or 8,000,000 tons for the Cuba plant.

In the northwest part of Fidelity field there are some estimated 4,000,000 additional tons that will be added, bringing the estimated total to about 28,000,000 tons.

In the face of the obvious limits in strip tonnage available in the vicinity of the Company's properties now being mined a study is being undertaken to determine as nearly as possible all of the strippable reserves in Illinois, Indiana, West Kentucky and Missouri, and by what method such reserves can be acquired.

and arrangements have been made to do this.

After discussion, upon motion duly made by Mr. Gebhart, and duly seconded by Mr. Falkoff, the following preamble and resolution were unanimously adopted:

> WHEREAS, this Company plans to purchase from Truax-Traer Coal Company approximately 83 acres of land in Perry County, Illinois, containing an estimated 600,000 tons of coal, the total consideration being $16,191.06;
>
> NOW, THEREFORE, BE IT RESOLVED, that the proper officers of this Company, for and on its behalf, be and they hereby are authorized and directed to purchase said tract from Truax-Traer Coal Company, upon the terms as set forth above.

The Chairman reported on the Company's activities in acquiring stripping reserves in Colorado. On prospecting permits acquired from the Federal Government preliminary drilling indicates some 18,000,000 tons of strippable coal with perhaps additional tonnage available when a more complete drilling program is undertaken. This tonnage is located in Routt County near Hayden where Colorado Ute Electric Association is building a steam generating plant, the initial capacity to be 225 megawatts with additional units being planned for future expansion. This Company is also attempting to acquire both strip and underground reserves in west central Colorado near Grand Junction where the Public Service Company of Colorado operates a steam generating plant.

In Illinois this Company's reserves increased 5,000,000 tons over production for the year ended July 31, 1963.

The proposed President's letter and a report (Review of the Year) for the annual report for the year ended July 31, 1963, were discussed and approved as to substance as drafted.

The Chairman then stated that the next order of business was

BOARD OF DIRECTORS MEETING HELD MAY 8, 1963

The Chairman informed the Board that the Company had acquired an option to purchase 372 acres of land in McDonough and Schuyler Counties, Illinois (Industry Field) at a price of $170 per acre containing an estimated 600,000 tons of strippable coal. It was brought out in discussion that recent changes in transportation costs and improvement in underground mining cost place the Industry Field in a somewhat doubtful position in planning a stripping development on this acreage. Land acquisitions in this area have been limited to purchases or leases which can be made at approximately farmland prices. The land in question is adjacent to the other acreage that makes up the main body of the Industry Field and will fit into any future requirements for development. The area is being actively farmed and pastured by the Company at present.

After the above discussion, upon motion duly made by Mr. Nugent and duly seconded by Mr. Thorson, the following preamble and resolution were unanimously adopted:

> WHEREAS, the proper officers of this Company on December 2, 1963 entered into an Option with Contract to Purchase with John C. Stoneking and Bessie M. Stoneking, covering the purchase of approximately 372 acres of land in McDonough and Schuyler Counties, Illinois (Industry Field), containing an estimated 600,000 tons of coal, at a price of $63,240.00, payable $240.00 on execution of contract, and $9,000.00 per year for seven years, which agreement contains the usual provision that this Company may terminate it at any time by forfeiture of the payments previously made;
>
> NOW, THEREFORE, BE IT RESOLVED, that the proper officers of this Company, for and on its behalf, be and they hereby are authorized and directed to exercise said option with John C. Stoneking and Bessie M. Stoneking upon the terms and conditions as set forth above.

EXCERPT FROM UEC BOARD MEETING AUGUST 12, 1966

Mr. Morris outlined the need for additional stripping equipment at the Fidelity Mine. Present equipment will maintain current production rate in the present pit for approximately eighteen months, at which time, with deeper overburden, the 1650-B would need help to maintain production of approximately 180,000 tons per month.

After mining all of the coal in the present location (Green Pit), the estimated reserves at Fidelity that can be stripped is 23,000,000 tons. This is located in three different areas and shows overburden depths, rock and surface material that would require a machine to help the 1650-B to mine it all out economically. Without a helper, monthly production would be reduced from its current rate of 180,000 tons to approximately 125,000 tons, with resultant cost increase. Also, of this 23,000,000 tons, approximately 10,000,000 could not be mined at all with the one machine (1650-B). The need for additional help is thus established as necessary.

Mr. Morris stated that after thorough investigation, a wheel, properly designed for the particular areas involved, seemed to be the best solution.

The following information and estimates have been developed.

1. Bucyrus-Erie has a standard design and has built a wheel for Peabody and one for Truax. It is high enough for us, but for our purpose certain modifications of design seem necessary. They put a price on their standard dsign of $2,500,000, and an estimate on transportation and erection of $400,000.

While we don't know exactly what the change in design we would need would cost, they have indicated that the engineering and other factors involved would cost somewhere in the neighborhood of another $400,000. So it appears we are thinking about something over $3,000,000 for a Bucyrus machine properly designed and in place, ready to operate.

2. We have built four wheels, three of which are now in operation. The W-2 is at Buckheart, the W-3 at Banner, and the W-4 at Cuba. The W-3 was originally at Fidelity Mine but the design of this particular machine did not properly serve the need at that mine and it was not successful there. It was redesigned and moved to Banner and our cost and profit record there will indicate its satisfactory performance.

   The wheels at both Buckheart and Cuba are doing a satisfactory job.

3. We have all of the engineering information and blue prints necessary to build the type of wheel we need at Fidelity. This is quite a cost saving.

   The machine would be built higher, the digging end longer, and the stacker end some longer and higher to place the dirt back far enough in deep overburden to avoid slides. We would use the base, motors and quite a lot of other material from the 5561 Marion shovel which is now a stand-by at Fidelity.

4. Utilizing our engineering knowledge, blue prints, and experience, and building the machine on the site, would effect considerable savings. The repair parts in inventory for the 5561 and also repair parts in inventory for Wheels 2, 3 and 4 would be available for the W-5 machine.

5. Our estimate of the total cost, using our own people for the engineering and supervision, and contracting for the welding, erection and so forth, is $1,600,000.

We feel our estimates are within reason and have included in the above figure $200,000 for contingencies and unexpected difficulties.

In our five-year budget for capital expenditures, we included $250,000 in 1966 and $1,750,000 in 1967.

We can build this machine and have it in operation within fourteen months. The best estimate from Bucyrus is eighteen months and probably longer.

After discussion, upon motion duly made by Mr. Nugent, and duly seconded by Mr. Thorson, the following resolution was unanimously adopted:

RESOLVED, that management be authorized to proceed with the necessary purchasing and contractual arrangements to build Wheel No. 5 for use at the Fidelity Mine at a cost of not to exceed $1,800,000.

EXHIBIT "A"

DX 114

THE UNITED ELECTRIC COAL COMPANIES

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS

Notice is hereby given that the Annual Meeting of the Stockholders of The United Electric Coal Companies will be held at the office of the Company, 307 North Michigan Avenue, Chicago, Illinois, on Friday, October 29, 1954, at 10:30 A.M. Central Standard Time, for the purposes of electing a Board of eleven (11) Directors to serve until the next Annual Meeting of Stockholders and until their successors are elected and qualified, and of transacting such other business as may properly come before the Meeting.

The Board of Directors has fixed the close of business on September 29, 1954, as the record date for the determination of stockholders entitled to notice of and to vote at the Meeting.

If you do not expect to be present at the Meeting, please sign and mail the enclosed proxy in the return envelope provided for that purpose. No postage is required if mailed in the United States.

PROXY STATEMENT

1. The Annual Meeting of Stockholders. The Annual Meeting of the Stockholders of the Company will be held on October 29, 1954, pursuant to its By-laws for the purposes of electing a Board of eleven (11) Directors to serve until the next Annual Meeting of Stockholders and until their successors are elected and qualified, and of transacting such other business as may properly come before the Meeting. As of the date of this Proxy Statement the election of Directors is the only matter which the management intends to present or knows will be presented by others. Should any other matter properly come before the Meeting, it is the intention of the proxies named in the enclosed proxy to act upon it according to their best judgment.

2. The Proxy. Proxies in the form which is enclosed with this Notice and Proxy Statement are solicited by and on behalf of the management. When the proxy in such form is properly executed and returned the shares represented thereby will be voted at the Annual Meeting. Any stockholder giving a proxy in such form has the power to revoke it at any time prior to its being voted.

3. Voting Securities and Principal Holders thereof. As of September 29, 1954, the record date for stockholders entitled to notice of and to vote at the Meeting, the Company had 750,000 shares of common stock of $5 par value each authorized, of which 677,920 shares were issued and outstanding. Each stockholder has one vote for each share held. In the election of Directors, the holders of stock do not have cumulative voting rights.

As of July 31, 1954, Material Service Corporation owned beneficially 72,600 shares of common stock of the Company which shares represented approximately 10.7% of the outstanding voting securities of the Company on that date.

CONF-660930

DX 116

nuclear power briefing

for the COAL INDUSTRY

September 29-30, 1966
Oak Ridge, Tennessee

United States Atomic Energy Commission | Division of Technical Information

• • •

Nuclear Fuel Fabrication

by James H. Hill
Vice President, United Nuclear Corporation

It is a pleasure for me to be in Oak Ridge to participate in the nuclear power briefing for the Coal Industry. I notice that Dr. Weinberg is speaking this evening on the subject "Uranium and Coal - Partners or Rivals?". I suspect that he is going to suggest that we should be partners. In any event it is in that spirit that I accepted the invitation to be here.

The purpose of this paper is to present a brief account of the various steps in taking uranium from the earth and converting it into a finished reactor core for the production of central station electrical power. The details involved in "burning" uranium are somewhat more complex in comparison with the burning of coal. However, some of the complexity of the subject can be attributed to the nuclear jargon, mathematical equations, and chemical formulae which are commonly used in the industry. As far as fuel fabrication is concerned I think that it unfolds in fairly simple steps for discussion as follows:

Mining and Milling -
Conversion of U_3O_8 to UF_6
Enrichment of UF_6
Production of UO_2 and Pellets
Fuel Tube Loading - Welding and Assembly
Fuel Management
Market Development for Fuel Fabrication
Price Trends

I will limit my remarks to a brief discussion of each of these steps related to the fabrication of nuclear fuel for commercial power reactors.

Mining and Milling

First the uranium ore must be located, the ore body developed and then mined. A major portion of the mines and mills is located in New Mexico, others are located in Wyoming and Colorado. The ore is usually hauled to the mill in large trucks.

The purpose of the milling operation is to recover the U_3O_8 from the ore. The ore that is being mined today contains about four to five pounds of U_3O_8. The mill that I will describe is designed to process about 3,000 tons of ore per day by the alkaline leach-caustic soda precipitation method.

The first step in the milling operation is the crushing and screening of the ore in a closed circuit to produce a crushed product of less than half an inch in size. Some of the ores are wet and must be put through a rotating kiln-type dryer between the crusher and the screens. Next the ore is introduced into a ball mill grinding and classifier circuit in which it is reduced to the size of extremely fine sand. A slurry and solution of this finely ground ore is pumped to a large tank with slowly moving rakes

in the bottom. The ore slurry settles to the bottom and is t... umped to a leaching circuit where the uranium goes into solution by reaction with sodium carbonate. The uranium solution is separated from the worthless sands by filtration and is then reacted with sodium hydroxide. It precipitates as U_3O_8 which we call "yellowcake". The "yellowcake" is filtered from the slurry and heated in a furnace. Heating at about 1600°F converts the vanadium in the "yellowcake" to a water soluble compound. The hot material drops into a tank of water and the vanadium dissolves. The vanadium is sold as a by-product. Again the "yellowcake", now free of vanadium and assaying 86% uranium oxide, is filtered, dried, and packed in drums that contain 1,000 pounds of finished product ready for shipment. It takes about 4,000 to 5,000 tons of this material (U_3O_8) to fuel an 800 Mwe reactor over its thirty-year lifetime. The cost of the U_3O_8 is about 27% of the total cost of a reactor core.

Conversion of U_3O_8 to UF_6

The next step in fuel preparation is the conversion of U_3O_8 into UF_6, the feed material for the gaseous diffusion enrichment plants. Two conversion processes have been in general use in this country. The process used in the Government plants involves the removal of impurities from the U_3O_8 in nitric acid solution by an organic solvent extraction process. The resultant uranium oxide is hydrofluorinated and converted to a green powder called uranium tetrafluoride (UF_4) -- additional treatment with fluorine converts it to UF_6. The second method, used in industry, is more direct. It eliminates the solvent extraction step and carries the impurities through to the UF_6 phase where they are remove' by distillation.

The Government UF_6 plants and the Allied Chemical Company's UF_6 plant at Metropolis, Illinois have been shut down for over two years. Allied indicated recently that it is ready to resume operation. I expect that within the next few years other companies will participate in the business of converting U_3O_8 to UF_6.

The cost of conversion of U_3O_8 to UF_6 is about 5% of the total cost of a reactor core.

Enrichment of UF_6

After the U_3O_8 is converted to UF_6, it is shipped to one of the Government's three gaseous diffusion plants for enrichment. The natural uranium in the UF_6 feed contains 0.711% uranium-235, the fissionable isotope. It has to be enriched to about 3% for use in the types of reactors that are being built today.

Prior to 1964, enriched uranium could be owned only by the Government but it could be leased at 4-3/4% interest for private licensed uses. Since the passage of the Private Ownership Act of 1964, it can be either purchased or leased. The purchase price is based on full recovery of Government costs -- $8 per pound for U_3O_8 and $30 per kg unit of separative work in the enrichment service. Beginning in 1969, it will be possible to produce or purchase U_3O_8 at competitive prices, convert it to UF_6 and have

it enriched in the Government's plant by paying the $30/kg separative unit tolling charge.

Two products emerge from the diffusion plant. One with an increased content of fissionable material and one with a decreased content. The enriched material is the fuel; the depleted material is called "tails". The owner of the material will have the option of giving up title to the depleted material or of taking it by paying handling and shipping charges. Someday these tails probably will be valuable as fuel for breeder reactors but today they have little value.

The cost of enrichment is about 32% of the total cost of a reactor core.

Production of UO_2 and Pellets

The next step in nuclear fuel fabrication is to convert the enriched UF_6 into the proper chemical and physical form required in the final reactor core. Pressurized Water Reactors (PWR) and Boiling Water Reactors (BWR) require about the same amount of basic fuel material (U_3O_8) per megawatt of capacity over a thirty-year plant life. Both are fueled with pellets of UO_2 and now the trend is for both to use zirconium fuel tubes. There the similarity in fuel ends. A typical high power PWR uses an initial loading of about 220,000 pounds of UO_2 pellets that are about .30 inch in diameter. A typical high power BWR uses an initial loading of about 360,000 pounds of UO_2 pellets that are about .50 inch in diameter. The initial loading for the BWR is larger than the PWR because the enrichment is lower. However, the PWR requires the production of about twice as many pellets per pound of UO_2 because of the difference in pellet diameter.

The chemical and physical operations required in the production of UO_2 pellets are complicated only by restrictions on equipment and procedures imposed by criticality and health physics considerations.

The conversion of enriched UF_6 to UO_2 is generally accomplished by either the "ammonium diuranate" (ADU) process or by the "organic reduction" process. The differences in these two processes occur primarily in their first steps in converting UF_6 into a stable solid compound suitable for further processing.

In the "ADU" process gaseous UF_6 is introduced into a solution of ammonium hydroxide. This forms a stable solid compound, ammonium diuranate. The ADU is separated by filtration and dried, then converted to UO_2 powder by heating to red heat in the presence of steam and hydrogen.

The "organic reduction" process begins with introduction of gaseous UF_6 into a vessel containing an organic reducing agent. The UF_6 is converted to UF_4, a stable compound commonly known as greensalt. The UF_4 is then converted to UO_2 powder by a reaction with steam and hydrogen.

The UO_2 prepared by either of these processes is in the correct chemical form for reactor use but is much too bulky. To reduce the bulk,

it is pressed into cylindrical pellets. Normally a press feed preparation step is required to give the bulky UO_2 powder better flow characteristics prior to entry into the die cavity of the press. This step produces a granular feed by means of agglomerating the powder with a wax binder. After pressing, the pellets are sintered in high temperature furnaces to form a high density ceramic body. The sintered pellets are then centerless-ground to obtain a finished diameter to a ± 5/10,000 of an inch specification and are made up into stacks for loading into fuel tubes.

Fuel Tube Loading - Welding and Assembly

The loading of pellets into zirconium tubes is a rather straightforward operation. The zirconium tubes are about 144 inches long. A large power reactor requires about 450,000 feet or 85 miles of tubes or between 40,000 and 75,000 pounds of zirconium depending upon tube wall thickness.

After the pellets are loaded in the tubes, end caps are welded to seal the pellets inside the tubes in an inert atmosphere. At this point we refer to the product as fuel rods. It takes about 35,000 to 40,000 fuel rods per reactor core for a large plant. The fuel rods are assembled into bundles with appropriate spacers and structures for holding them in a fixed position within the reactor core. An individual fuel assembly for a BWR will contain about 49 fuel rods. An assembly for a PWR will contain about 225 rods. In the BWR the fuel assembly is enclosed in a zirconium can or shroud to accommodate cruciform-type control rods which fit in between each group of four assemblies. The PWR does not use a shroud and present design incorporates control rods in place of fuel rods in selected positions in the assembly. The control rods in both types are needed to regulate the rate of energy production.

The fuel assemblies and control rods combined form the complete reactor core. When the core is placed in the reactor pressure vessel, similar in principle to placing an immersion heater in a teapot, you have "instant" power available -- all you have to do is add water. When the control rods are withdrawn nuclear fission begins (the uranium-235 is "burned") and heat is created which produces steam to drive the turbine-generator system which produces electrical power.

The fabrication cost component, which includes the cost of the zirconium tubes and the production of UO_2 powder and pellets, represents about 36% of the total cost of a reactor core.

Fuel Management

The objective of fuel management is to achieve safe operation and minimum power generation costs. Once the reactor core design has been established fuel management begins. The finished fuel assemblies are checked to verify that the quantities and distribution of uranium-235 meet design specifications. This provides a "bench mark" for subsequent calculations and operational instructions specifying the exact positions or withdrawal patterns in which the control rods should be operated. The maximum power peak position in the core is calculated as a function of control rod position. This is compared with the maximum heat flux that can be tolerated.

The control rod pattern is programmed so that maximum power removal can be achieved without damaging the fuel rods. Power distribution calculations are made on a continuing basis to maintain a precise record of how much enriched uranium has been "burned" in each fuel element and how much plutonium has been produced. The fuel managers thus can identify which fuel assemblies should be removed for reprocessing and the proper location for the addition of new fuel. This type of information supports the selection of a refueling scheme or change in design to yield maximum "burning" of the fuel consistent with minimum fuel cycle costs.

Market Development for Fuel Fabrication

Some special problems face the fuel fabricators and electrical utilities in the replacement core aspect of the business. The utility industry has recognized the need for obtaining competition for its fuel supplies. In the beginning utilities purchased one or two cores from the nuclear power plant manufacturer, with options for future reloads. This did not assure competition on future fuel supply. It is in the nature of reactor core performance, however, that the calculated data and data obtained during operation have to be carefully reviewed and assimilated in order to provide a reasonable set of specifications on which a fuel supplier can bid. Unless the utility company obtains these data, competitive fuel suppliers are placed at a severe disadvantage.

One of the ways utilities can assure competition is to take steps during the initial contract negotiations to insure the availability of sufficient drawings, specifications, operational and performance data to permit competitive bidding on future fuel supplies. If the utility company desires firm warranties for future fuel loadings, then detailed drawings, including materials, dimensions and tolerances, especially as they relate to mating with existing reactor or plant components such as grid structures, handling tools, etc., should also be provided. The detailed operating history of the original fuel and control rods, including burnups, isotopic compositions, power patterns, etc., should be made available to permit the competitive fuel supplier to predict performance of his fuel as related to the initial fuel remaining in the reactor. Water chemistry, corrosion data on materials in the coolant circuit, and thermal-hydraulic performance of existing fuel are also necessary to assure compatibility with replacement fuel.

By effectively requiring this type of information, utilities will be in a position to obtain competitive bidding for replacement fuel from companies other than the initial reactor supplier during the life of the plant. Perhaps an easier way that utilities could assure competition for replacement cores would be to require the reactor manufacturer to procure the equivalent of a reload batch of its initial fuel assemblies under subcontract to a fuel fabricator.

Price Trends

I have taken the liberty of discussing some of the problems that are being encountered by utilities and the nuclear industry as the market develops. I realize that through all of this the subject in which you are

most interested is the future price trend of nuclear power. Only from that can you better appraise the competition that the coal industry faces from nuclear power.

Beginning with the announcement in 1963 that the Jersey Central power plant at Oyster Creek would be nuclear, the electrical utilities have contracted for about 19,000 Mwe installed nuclear capacity in 27 plants. They have announced plans for an additional 6,500 Mwe in 9 plants for a total of about 25,500 Mwe. This does not include the nuclear capacity of about 1,400 Mwe in 15 plants announced, in operation or under construction prior to 1963, nor does it include the prospects for an additional 11 plants expected to be announced within the next year with an additional capacity of about 7,000 Mwe. By 1970 over 11,000 Mwe will be in operation increasing to about 50,000 Mwe in 1975 and to more than 100,000 Mwe by 1980. At that point one out of three new plants may be nuclear.

Some predict that fuel cycle costs will decrease from around two mills per kilowatt-hour for plants operating in 1970 to one mill per kilowatt-hour in 1980. Assuming that the average cost of fuel is 1.5 mills per kilowatt-hour over the thirty-year life of the large plants announced since 1963, the total fuel cycle cost over the life of these plants would be about $8.0 billion. Assuming an initial capital cost of installation of $110 per kilowatt the fuel cycle cost over the life of the plant is almost three times the initial capital cost.

This serves to illustrate two important points. The incentive for further reducing fuel cycle costs by new developments, and the incentive for effective competition in that portion of the business that is really big -- fuel replacement.

It is difficult to predict price trends because of the many variables involved. New processes are under development in industry to produce UO_2 powder with consistent characteristics at reduced costs. Further automation in the production and handling of pellets will reduce costs. The most significant accomplishment in reducing fabrication costs will be the development of a process for obtaining an acceptable fuel element by loading UO_2 powder directly into the fuel tube by vibratory compaction or some other method to avoid the production and handling of the millions of UO_2 pellets required in a core.

An important area for decreases in fuel cycle cost is in the improvement in "burnup" or power generating lifetime of the fuel. The extent of "burnup" is not basically limited by materials because there are design alternatives to solve some of the problems, such as swelling of the fuel due to buildup of fission product gases. The basic limitation is in the control of reactivity of the core and its relation to overall economics. In other words, to achieve longer lifetime and more efficient use of the fuel, considerably more enriched uranium must be added to the core than is necessary to sustain operation in the initial stages. This excess uranium is controlled by adding a burnable poison such as boron. Thus a larger inventory of enriched uranium would have to be financed throughout the entire operation. An economic balance has to be struck between this added cost of financing and the reduction in cost due to longer life of the fuel.

When we start recycling plutonium in replacement cores, this problem will be alleviated to some extent because the plutonium will contain up to 20% plutonium-240. This is an isotope that serves as a poison, similar to boron, in the early life of the reactor by absorbing neutrons. It not only burns out as a poison but converts to plutonium-241, a fissionable isotope which in effect replaces fuel "in situ". I think burnup can be increased by several thousand megawatt days per ton with a decrease in power cost of around 0.1-0.2 mills per kilowatt hour. This could mean a reduction in fuel cost of about $40 million over the life of a 1,000 Mwe plant. Of course the improvement in materials and techniques to permit achieving higher power densities and higher heat flux rates will have a great influence on reducing fuel cost.

The price of U_3O_8 could vary from $6 to $8 per pound up to 1980 without significantly affecting the cost of power. A change in the cost of U_3O_8 by $1 per pound would change the cost of power by about .07 mills per kilowatt-hour. A change of $4 per kilogram separative unit cost in enrichment service would also result in a change in the cost of power of about .07 mills per kilowatt-hour.

The price for the conversion of U_3O_8 to UF_6 was recently reduced by Allied Chemical from $1.25 to $1.04 per pound. With the market that is expected in the early 1970's and the building of competitive plants, one could expect that the price for conversion could be reduced considerably.

I am pleased to have had the opportunity to talk to you and I am sure that representatives from other segments of the nuclear industry will be glad to discuss the subject with you and I will try to answer any questions that you may have.

WASTE BYPRODUCT PRODUCTION *

R. E. Blanco
Oak Ridge National Laboratory

(Presented at the Nuclear Power Briefing for the Coal Industry, September 29-30, 1966, Oak Ridge, Tennessee.)

This afternoon I will summarize the status of the nuclear by-product disposal problem, or as it is more commonly called, the nuclear waste disposal problem and attempt to indicate the probable course of future developments. It has been said that a safe and economical solution to this problem must be found if nuclear power is to be successful. Actually, the importance of this problem is the result of the hazardous nature of these wastes rather than the cost of the operations since our studies predict that the cost of waste treatment will be only a small part of the total cost of nuclear power. In short, "We must ensure that these hazardous wastes are permanently isolated from the human environment by some practical method."

(1) Origin and magnitude of problem.
(2) Present treatment methods.
(3) Development of new treatment methods.

SLIDE 1. Origin of Wastes (66-680)

(a) Previous speaker described the recovery of unused thorium, plutonium, and uranium as products from the processing plant. The radioactive fission products are also produced as nuclear by-products.

(b) The radio-isotopes are true by-products if used by industry, but they are waste products if they serve no useful purpose.

(c) Three wastes types:

(a) Aqueous high level, intermediate level, and low level.
Stored in tanks or purified and discharged.

*Research sponsored by the U.S. Atomic Energy Commission under contract with the Union Carbide Corporation.

(b) Solid wastes are buried.

(c) Gaseous wastes are filtered to remove all radioactive particles and discharged up a stack. The air surrounding the stack meets all Federal requirements regarding radioactivity content.

(d) Radioisotopes can be recovered for use by industry as waste by-products. However, we do not predict that the cost of waste treatment will be decreased significantly by the sale of isotopes. We are not sure that the market will ever absorb all of the radioisotopes produced in the power industry.

(e) The other radioactive products serve no useful purpose and are called radioactive wastes.

(f) Liquid wastes are the greatest problem since they contain essentially all of the radioactive products.

SLIDE 2. Waste Management Program (65-11621)

(a) High Level

(1) High salt; 99.99% of fission products; relatively low volumes; now —> tanks; future —> solidify —> salt mine.

(b) Intermediate Level

(1) High salt; <0.01% fission products; relatively low volumes; now —> tanks or bury in concrete. Future —> bury in asphalt or inject as slurry of concrete into deep shale formations. We hope to minimize the volumes of this type of waste through improved processes.

(c) Low Level

(1) Low salt; just water with trace of radioactivity.

(2) Treatment and discharge. Present:

(a) Chemical flocculation.

(b) Ion exchange.

(c) Distillation.

(3) In large plants, chemical treatment cheaper than distillation:
$<1-6/1000 gal vs $15-100/1000 gal.

(d) Remaining discussion on high and intermediate level wastes only, since they constitute the major problem.

SLIDE 3. Approximate Volumes of Wastes and Fraction of Cost (66-640)

Not intended as a precise calculation; used only to show approximate distribution of costs.

(a) Note volume increase from High Level to Intermediate Level to Low Level.

(b) With mechanical decladding, small IL waste.
~110 gal/ton
Buried

(c) Relative importance of HLW is apparent. Recently much research and development work concentrated in this area.

SLIDE 4. Estimate of Waste Conditions in Year 2000 (66-1279)

(a) Estimate as of March 1966 based on AEC estimate in March 1965.

(b) Estimate is now being revised, but illustrates magnitude of the problem.

(c) Shows 31 million gallon of HLW in year 2000.

(d) More than 70 million gallons now in storage in the U.S. This waste contains much less radioactivity but the two volumes illustrate the magnitude of the problem.

(e) The new waste contains a much higher concentration of radioactivity.

(f) Total radioactivity in year 2000 equal to that from 500,000 tons of radium.

$$\frac{(\sim 5 \times 10^{11} \text{ total curies})}{(454) \quad (2000)} = \frac{5 \times 10^{11}}{1 \times 10^{6}} = 500{,}000$$

(g) Strontium 90 would be equivalent to 8,600 tons of radium.

(h) Total curies = greater than 5×10^{11} in year 2000.

~130,000 curies/gal after one year cooling

~7,000 curies/gal after 30 years cooling.

SLIDE 5. Present Methods for High Level and Intermediate Level (Photo 46189)

(a) All high level waste in the world is stored in tanks at the present time.

(b) Slide shows Savannah River storage tank.

(c) Contains: cooling coils

3 lines of containment (2 mild steel, one concrete)

(d) One million gallon tank costs about $1.5 million.

(e) Nuclear Fuel Services Co. tanks are ~700,000 gal.

SLIDE 6. Waste Storage Facility (Photo 46190)

(a) Facilities are complicated.

Future Methods

Some years ago under the sponsorship of the AEC, we conducted an extensive survey at ORNL to devise the safest possible treatment and storage method for high level wastes. The safest practical method that we could think of was to convert the waste to solids, preferably extremely insoluble solids, such as a glassy material, and then store it in a place where it would be isolated from water forever; for example, a salt mine where there has been no water for thousands of years. The insolubility of the solid waste would provide extra safety during the interim storage and shipment periods. The question was, "Was this system practical and economical?" We have pursued a development and economic evaluation program to answer the question.

SLIDE 7. Management of High Level Wastes (72614-83)

(a) Shows overall program.

(b) Economic evaluation of each step.

(c) Granite vaults 2 times more expensive and concrete vaults 5–7 times more expensive than salt.

(d) AEC also sponsored programs at ORNL, BNL, and Hanford Battelle's Northwest Laboratory to develop solidification methods.

(e) Work is being carried out at ORNL to determine the feasibility of storage in salt.

The remaining slides will summarize these studies.

SLIDE 8. Relative Volumes of Wastes from Purex Process (Photo 48506-C)

(a) Relative volumes.

(b) About factor 10 reduction from liquid to solids.

(c) What is the safety and economic advantages of conversion to solids?

SLIDE 9. Conversion of Waste to Glass (Photo 53673-C)

(a) Typifies the conversion step.

(b) Could also just evaporate to dryness and calcine to 500°C.

(c) These are the bases for the ORNL pot calcination and potglass processes.

(d) Glass has the advantages of high thermal conductivity and extreme insolubility.

SLIDE 10. Flowsheet for Converting Wastes to Solids (Photo 50885R)

SLIDE 11. ORNL Pots (Photo 54842)

(a) Stainless steel, 8 to 24 in.-diam x 8 ft high.

(b) Weld top shut - send to storage.

(c) Fill with glass product or calcine.

(d) One 12-in.-diam pot x 10-ft-long holds 6.08 ft^3 - 15 pots/year of glass would hold all high level waste from a 1000 Mw(e) reactor at 10,000 or 20,000 Mwd/ton.

SLIDE 12. ORNL Hot Pot from Furnace (Photo 59579-C)

SLIDE 13. BNL Continuous Process (CN3-1157-65 BNL Color Photo)

(a) Evaporator to remove liquid.

(b) Flows to a continuous platinum melter to form glass product.

(c) Glass product flows to pot receiver.

SLIDE 14. Hanford Spray Calciner (LR-Dwg. 53279)

(a) Spray dried.

(b) Melted to glass in continuous platinum melter.

(c) Flows to pot receiver.

These three new solidification processes will be tested with radioactive waste in a new pilot plant at Hanford's Battelle Northwest Laboratory. Radioactive tests are expected to start late in 1966.

SLIDE 15. Waste Carrier (Photo 80765)

(a) Experimental carrier is 4 ft diam and weighs 30 tons (35 ton limit by road).

(b) Required carrier for 30 year old fuel, 5 ft diam - holds 36 - 6-in. diam x 10 ft pots, weighs 50 tons - shipped by rail - air cooled by convection - 6-in. to 8-in. thick lead shielding.

SLIDE 16. Salt Mine Storage Facility (63-239R or Color slide 61622)

(a) Experimental unit; old mine at Lyons, Kansas. Leased by AEC.

(b) Easily and cheaply mined.

(c) Many old mines available; 1000 feet down.

(d) Salt beds widely distributed.

(e) Represents ultimate disposal with minimum or no future long term surveillance.

(f) No water; automatic sealing by salt plastic flow.

SLIDE 17. Carrier in Salt Mine (Photo 80977)

SLIDE 18. Experimental Pots in Salt (Photo 80997)

SLIDE 19. Salt Corridor (Photo 81000)

SLIDE 20. Waste Management Data for Conversion to Solids (66-1280)

(a) 34,000 ft^3/year in year 2000.

(b) 310,000 ft^2 total in year 2000. ≈ 2.3 million gal vs 31 million gal predicted if it remained as liquid.

(c) Need 3,420 ft of 48-ft-wide canals.

(d) Need 2.1 acres in year 2000 but have committed 1,185 acres of salt.

SLIDE 21. Costs for Storage (65-11624)

(a) Uranium at 10,000
Thorium at 20,000 Mwd/ton.

(b) New tank each 50 years.

(c) Interest rate 4%: present worth financing.

(d) Within limits of these estimates, costs are the same. Therefore, we feel that we are justified in recommending fixation in glass or calcination and storage in salt. This is the safest system that we can conceive of.

(e) Actually, total predicted cost is less than 1% of total cost of 3.5 mill power.

(f) Cost appears to be small but the importance of proving a satisfactory waste disposal method is very great, since, as I said at the beginning, a successful solution to the radioactive waste disposal problem is required if nuclear power is to be successful.

IN SUMMARY

(a) Present treatment methods for wastes, based on tank storage, are adequate, safe, and economical for an interim period.

(b) Improved treatment methods are now under development. As these programs culminate in the next few years we expect to demonstrate significant improvements in safety and economy. At that time, private industry will be able to choose the ultimate disposal system for their use with some certainty.

* * *

URANIUM AND COAL - PARTNERS OR RIVALS?*

Alvin M. Weinberg

The story is told of the hungry lion who was eagerly anticipating a meal of an early Christian martyr. When the Christian was thrown into the arena with the lion, he whispered something into the lion's ear whereupon the lion became deathly pale, trembled all over, and slunk back to his cage. After the Christian was set free he was asked: "What did you say to the lion?" and the answer was: "I told the lion he would be called upon to make an after-dinner speech."

I sympathize on this occasion with the lion. For I am expected, I suppose, to stand before you distinguished representatives of our country's coal industry, who have listened to a day's discussion of just how nuclear energy will put coal out of business, and persuade you that really uranium is coal's best friend. This I cannot do. So to speak, if uranium is coal's best friend, coal doesn't have to look for an enemy. So you will excuse me if I confess that this is an after-dinner speech which at first caused me plenty of indigestion.

Yet on thinking about the matter, I began to relish the job after I decided to speak this evening not as an official spokesman of the Atomic Energy Commission, (which I am not), nor even as the Director of the Oak Ridge National Laboratory, but simply as a former basic scientist who for the past 25 years has been fascinated by the problem of energy. Thus I

---

*For presentation before the National Coal Association Meeting in Oak Ridge, September 29, 1966.

shall try to look upon the relation between uranium and coal not from the viewpoint of a proponent of one source of energy, but rather more symmetrically, from the viewpoint of a person who believes that cheap energy is the world's most important resource. With the world's population increasing so rapidly, we shall stave off Malthus only if we can get more and ever more energy. It is my belief that every source of energy will be used in this energy-exploding economy; that each source will eventually find those spheres of use which capitalize on its strengths and minimize its weaknesses; and that the competition between the various sources of energy will tend to keep everyone honest, much to the benefit of the society that must use energy at an increasing rate. I shall therefore try to examine the strengths and the weaknesses of both sources of energy, and to suggest what seem to me to be the major technical problems that each must overcome before it can assume its ultimate and proper niche.

The Strengths and Weaknesses of Nuclear Energy

I begin with nuclear energy: what are its strengths and its weaknesses? Its strengths have been fully expounded today: 1. In large sizes, nuclear electricity appears to be extremely cheap. 2. Because nuclear fuel is compact, the price of nuclear electricity does not depend upon the location of the plant. 3. If breeders are successful, we shall have available an essentially inexhaustible source of energy in the residual uranium and thorium in the earth's crust. 4. Nuclear power plants can be built so as to be almost pollution-free. 5. Finally, nuclear energy is a child of aggressive large-scale research, much of it sponsored by the government, and it continues to profit by the research activities of a vast technical

establishment. Its weaknesses perhaps have not been expounded as fully by the speakers though, judging from the questions put by the NCA, nuclear energy does have weaknesses. I would list them as follows: 1. Nuclear energy is really cheap only in very large size - say 400 MwE and above. 2. Nuclear converters of the present generation burn only a small part of the uranium. Even if more cheap uranium is found, the cost of energy from burner reactors will eventually rise. 3. Though I believe nuclear power plants can be made arbitrarily safe, to do so requires elaborate "engineered" safeguards. How much these must cost to insure beyond any possible doubt against a nuclear catastrophe will always be a matter for argument. In any case, I can understand why so far people are reluctant to place large reactors very close to large cities. 4. Disposal of radioactive waste products from a large nuclear power plant is relatively complicated.

The nuclear community is aggressively capitalizing on its strengths and remedying its weaknesses. You have already heard how the nuclear world is mobilizing around the breeder problem. (Notice that I say breeder, not fast breeder, since I happen to belong to the minority that believes the thermal breeder based on thorium as a raw material is a better long-term bet than is the fast breeder based on uranium.) I might interject at this point my own opinion - that the cheap, safe breeder is one of our society's most important technological goals, and that we ought to be prepared to spend much more on it than we are now doing. In this I believe I agree with many spokesmen of the coal industry. And you have heard of the continuing search for ways to increase the safety of nuclear power plants and to dispose of radioactive residues safely and cheaply. My point

is that the nuclear community understands its strengths and its weaknesses and is mobilized sharply and decisively around them: if breeders are needed, let's get on with their development; if waste disposal is a problem, let's solve it, and so on. And of course in getting on with its job, the nuclear community has two advantages: first, the development of nuclear energy is high national policy and therefore enjoys heavy government support; and second, the industry is dominated by relatively few very large, technically-oriented companies that are accustomed to devoting a sizeable fraction of their income to scientific research and heavy technical development.

The Strengths and Weaknesses of Coal

Let me now list the strengths and weaknesses of coal, as I see them. Its strengths I list as follows: 1. Coal-fired power plants have operated successfully much longer than have nuclear plants. 2. Coal-fired plants, no matter in what size, need no engineered safeguards. 3. Coal's ashes, though troublesome, are far less dangerous than are fission products. 4. Coal-fired plants are cheaper than nuclear plants in the smaller sizes. 5. Coal, in addition to being a source of energy, is a valuable organic chemical and reducing agent: it can be used to reduce iron ore, and it can be converted into liquid fuels, or even into synthetic stockings. Its weaknesses I list as follows: 1. Coal contains noxious pollutants, like sulfur. 2. Coal costs about 20¢/MBtu compared to nuclear fuel, which may cost as little as 5¢/MBtu, and the cost of coal rises sharply with distance from the mine. This redounds strongly to coal's disadvantage in large size plants where the capital cost of the nuclear plant matches that of a coal plant. 3. The coal industry is relatively fragmented, and I suppose I

would say less scientifically oriented than is the heavy electrical equipment industry. 4. Coal, though supported by the Department of the Interior, hardly enjoys as much government support as does nuclear energy.

Having listed the strengths and weaknesses of coal, I shall now go through the list and try to see how the strengths can be capitalized on and the weaknesses eliminated. In so doing I shall try to take the point of view not of a proponent of either atomic energy or of coal, but that of a person concerned in the broadest way with energy in our society.

First, I remind you that the coal industry is in no imminent danger from nuclear fuel. During the past year, more coal was used in the United States than in any year since 1945. The approximately 8,000 Mw of new coal-fired power plants built last year are expected to run for a good 30 years; and with our demand for energy growing, I cannot see a diminishing absolute market for coal. The decision to go coal or go nuclear during the next decade, say, will continue to be a close thing, even in the large sizes where the economics favors nuclear power. In some cases residual doubts that utilities may have about nuclear systems will swing the balance toward coal. These matters will be discussed in more detail tomorrow at the panel on the role of various energy resources, and so I shall not dwell upon them.

The two main technical handicaps coal must overcome if it is to regain its unchallenged position as the fuel for large central stations is first, pollution by SO_2 and other waste products, and second, its relatively high cost of 20¢/MBtu. Let me first consider the second technical question. I ask, are there credible ways of reducing the fuel cycle cost in coal plants?

Two approaches are possible: first, to rationalize further the mining and hauling of coal; and second, to increase the thermal efficiency of coal-burning stations. I'm sure that this audience knows much more about mining and hauling of coal than do I - about the new automatic mining machines being developed by the Joy Manufacturing Company; or the unit-trains; or the coal slurry pipelines which at one time seemed to show so much promise. I can only urge that serious and thoughtful attention to these methods of reducing the fuel cycle cost be encouraged.

I would like to focus on the other, perhaps more promising, possibilities of reducing the fuel cycle cost - by increasing the thermal efficiency. One way which has received great public attention is by means of the magneto-hydrodynamic generator - MHD. Again I claim no expertise here, though my instinct somehow makes me rather skeptical: the very high temperatures required in a successful MHD generator pose serious materials questions whose solutions I cannot readily visualize.

Instead I should like to tell you of an interesting possibility that has grown out of the space-reactor work at the Oak Ridge National Laboratory. Mr. A. P. Fraas and his associates of ORNL have examined boiling potassium as a working fluid in a nuclear reactor. Potassium at atmospheric pressure boils at 1,400 degrees F. If it could be used as a topping cycle in a dual system much like the old mercury boiler that ran for so many years in Hartford, Connecticut, one could achieve a thermal efficiency of 55%. At this efficiency, for example, the fuel cost of the Cumberland City coal-fired plant which TVA rejected in favor of the Browns Ferry nuclear plant falls from 1.69 mills/kwh to about 1.20 mills/kwh. This is very close to the fuel cycle cost for the General Electric BWR, and distinctly lower than that of the Westinghouse PWR.

What would have to be done to bring the boiling potassium cycle into being? Obviously a great deal. But we have already operated a small turbine on boiling potassium for 2,500 hours, and there is no obvious reason why a much larger turbine could not be built. The turbine would have to be clad with Nb, as would the tubes of the potassium boiler; and this may turn out to be too expensive. However, I think the possibility deserves some attention, especially since a plant running at 55% thermal efficiency rejects only 55% as much heat to the environment as a plant of the same electrical output running at 40%. In my opinion, the path to 55% efficiency in large central power stations via the potassium turbine appears more credible than the path via magneto-hydrodynamics. If this is a reasonable path to follow, the knowledge created within the Atomic Energy Commission would be extremely useful in achieving the goal.

Let me return to the other technical problem faced by large coal-fired stations: pollution, especially by SO_2. This is a nasty problem which, as I understand it, is costly to eliminate. In this connection I might quote Congressman Chet Holifield, Chairman of the JCAE, who suggested that some of the expertise of the Atomic Energy Commission might be used to help figure out how to reduce the SO_2 effluent from burning coal.

> "If the power industry does not undertake to appraise the present pollution control problem in detail and police itself adequately, someone else - whether it be local, state or federal government - will impose further restrictions upon the industry. It would be far better for the power industry to set its own standards rather than to have restrictions imposed upon it from outside which may be unduly restrictive or unrealistic ...
>
> "The AEC's research and development facilities are second to none. Our objective should be to use them wherever they can be of value. For example, AEC has facilities to sample and measure contaminants in the atmosphere to exceedingly high degrees of accuracy. In addition, AEC has developed methods

of using radiation tracers to study processes such as those involved in the combustion of fossil fuels which will permit the analysis of the complete combustion and effluent process. In this way one could study the best ways of controlling and eliminating certain air pollutants.

"I certainly think the idea of utilizing specialized AEC capabilities for studying the problems of pollution control from fossil fuel plants is worth exploring. The importance of an adequate energy supply for the future goes far beyond a temporary competitive advantage of either nuclear over conventional fuel or vice verse. I am interested as a public servant in advancing the utilization and efficiency of all fuel resources. I believe it would be appropriate for officials of the electric utility industry to confer with responsible officers in the AEC and other executive branch agencies to discuss means of accomplishing this result."*

The Ultimate Place of Coal-Liquid Fuel

One admittedly long-range, though possibly very attractive, way of getting rid of SO_2 would be to liquefy coal, converting it to a crude oil essentially by adding hydrogen to the coal. In the process the sulfur is converted to the volatile H_2S which is eliminated from the final product.

This possibility of eliminating sulfur from coal by liquefaction leads to one of my main points - that in the battle for very large central station power, coal, even with the improvements I have envisioned, will ultimately lose to the most advanced breeder reactors. For example, the molten salt breeder, a pilot version of which you will visit tomorrow, should enjoy fuel cycle costs of about 0.3 mill/kwh. I estimate that such a system in 1,000 MwE size could, under TVA ground rules, produce energy at 1.5 mills/kvhE. Since in this reactor fission products are continuously removed, it has a certain built-in safety; and even if one fuels the reactor with thorium costing $40.00/lb., (there is enough in New Hampshire to meet the demands for many thousands of years), the cost of energy would still be below 2 mills, with TVA financing. In truth, I do not see any

*Nucleonics 24, 18 (July 1966).

possibility of large coal-fired plants meeting this competition which should be raising its head, seriously, in about 15 years.

Under the circumstances it seems to me common sense, and in the interest both of the nation and of the coal industry, for coal to move into a vast and different market: liquid fuel especially for vehicles and organic chemicals. However, since the market in organic chemicals is measured in millions of pounds/year, not millions of tons, I shall concern myself with the possibility of liquid fuels from coal.

The crisis that coal faces - if indeed one can describe as a crisis a situation in which coal still accounts for 24.5% of our energy - will not really take hold for 15 years or so. During that time we shall be mining our crude oil at an increasing rate. The current average price for domestic crude oil is $3.00/bbl., though the range goes from $2.00/bbl. to $3.40/bbl. for normal crude to $4.63/bbl. for high-grade Pennsylvania crude. Even though foreign crudes can be expected to come in at lower prices, I cannot imagine our country ever allowing itself to get in the position where we do not have an adequate domestic crude oil supply. Thus, we shall eventually have to get oil from solid materials - either from coal or from oil shales. When we shall have to do this on a large scale will depend on many factors and will vary from place to place: for example, in South Africa, which aims at self-sufficiency, oil (as well as many petrochemicals) is now produced on a huge scale from coal at the SASOL plant.

Where then do we stand in converting coal into oil - and is there any way in which nuclear energy can help? Basically, the problem in liquefying coal is to add hydrogen to the carbon contained in the coal - to

change C_2H, which is approximately what coal is, to CH, which is roughly the composition of liquid hydrocarbons. The hydrogen for this process can be obtained independently, say by electrolysis of water; or by steam-coal reforming with very high-temperature heat obtained from an outside source; or by steam-coal reforming with heat obtained by burning some of the coal with oxygen. These three processes are summarized in Fig. 1, prepared by C. E. Guthrie of the Oak Ridge National Laboratory. As you can see, the estimated minimum cost of $2.40/bbl. does not include losses, operating and maintenance costs, taxes, insurance, or profits. Nevertheless, one cannot escape the impression from the figures that liquid fuel from coal ought to become competitive in our country within a generation - roughly at the time when the requirement of coal for fueling central power stations diminishes.

What role can nuclear energy play in this great redeployment of coal? I see two possible roles, though I want to make clear that both of these are rather speculative at present. First, if the molten salt breeder, for example, can produce electrical energy at 1.5 mills/kwh, then we could electrolyze water with this cheap power to extract hydrogen at 20¢/MSCF; this is the source of the price used in the Guthrie Table, Case A. And secondly, if we can get high temperature by heating with electricity at 1.5 mills/kwh, rather than the 2.5 mills/kwh assumed in the figure, we could reduce Guthrie's $2.40/bbl. to perhaps $2.20/bbl. Or alternatively, if the high-temperature heat could be obtained from a reactor directly, this would be much more efficient than electric resistance heat, and could be used to advantage for the endothermic steam reforming step in Case B.

I would be doing you a disservice to pretend that I see a clear way for coal to take over the vast market for liquid fuel - either with or

without the help of uranium. But I am convinced that this is a most important direction to investigate thoroughly and seriously, and that the country's scientific resources ought to be deployed massively around this problem.

The Indivisibility of the Problem of Energy

This brings me to my last point. I listed as a weakness in coal's position its relative fragmentation, and its relatively unscientific tradition as compared with oil which is dominated by extremely large companies that are strongly influenced by science. It goes without saying that coal, in order to hasten the arrival of the time when liquefaction is economical, will have to devote more resources to research. Perhaps this will be done entirely within the coal industry - probably more likely through mergers between coal and oil companies, as illustrated by the recent merger of Continental Oil Company and Consolidation Coal Company.

Insofar as the large-scale conversion of coal to liquid hydrocarbons is a matter that touches the national interest, I believe the government should be involved, and involved heavily. To some extent this is already going on: the Bureau of Mines and the Office of Coal Research together have spent 10 to 12 million dollars per year on developing methods for liquefying coal. The AEC has pursued a very high-temperature reactor experiment, the UHTREX at Los Alamos aimed at providing heat for hydrogenation of coal. I would think it reasonable for government to take as seriously as the technology allows the problem of coal liquefaction in all its manifestations: generation of cheap hydrogen via cheap nuclear electricity, new process heat reactors, possibly using boiling potassium as a working fluid.

The rivalry between coal and uranium is good and in the best American tradition. It is good for coal to be put under the kind of economic pressure that forces it to improve mining methods, and come up with unit-trains. It is good for uranium to be asked sharp, no-holds-barred questions such as Mr. O'Brien and his staff at NCA are so good at asking.

But I think there is still something lacking. Nuclear energy has its government champion - the AEC and the JCAE; coal energy has its government champion - the Department of the Interior. I cannot fault either of these two vigorous and well-run agencies. Yet I would raise the question - should there not be some home in government for energy itself - not nuclear, or coal, or oil, or solar, or water - but all forms of energy which, after all, is the ultimate raw material?

That some such feeling must exist in Washington is suggested by the energy study that has been going on for several years in the Office of Science and Technology under the leadership of Ali Cambel, of Northwestern University, and that we are all awaiting. This study will look at the entire energy picture. I should think that the broad responsibility for energy suggested by the outlook of such studies might well become the job of some yet-to-be organized agency.

I realize that in suggesting that we alter existing government structures, I am treading on the most treacherous political ice. Yet I said at the beginning of my talk that I was speaking not as a representative of AEC nor for that matter of the Department of the Interior for whom ORNL also does work. I speak simply as a person deeply convinced of the increasing role of energy in our society. From this point of view, I believe it to be an important order of business of our government to reexamine its alignment and structure for dealing with the broad problem of

energy. Out of such a reexamination I hope will come a more rational way of coping with our society's ever-growing, and even insatiable, demands for energy, and that the full potentials of both uranium and coal will be exploited for the benefit of all.

* * *

EVALUATING THE COST OF NUCLEAR VERSUS FOSSIL-FUELED POWER PLANTS

Presentation By G. O. Wessenauer, Manager of Power,
Tennessee Valley Authority
At The
Nuclear Power Briefing For The Coal Industry
U. S. Atomic Energy Commission
Oak Ridge, Tennessee
September 30, 1966

Description of the TVA System

TVA supplies the power requirements of the region it serves from the output of 47 hydroelectric plants and 11 steam plants. These generating plants are connected with each other and with the loads they serve by 14,000 miles of high voltage transmission line, including 400 miles of new extra-high-voltage (500-kv) lines. The TVA system has strong interconnections with the major electric systems in adjacent areas. (See Figure 1.)

Load Growth

Rapid growth is a significant characteristic of loads in the TVA region.

Starting in 1933 with 250,000 kilowatts of capacity in the Wilson Hydro Plant and the Wilson Steam Plant, TVA has responded to the region's thirst for power until, today, system capacity exceeds 18 million kilowatts. Of this, about 4 million is hydro and 14 million is steam. (See Figure 2.)

A coal burning unit with 1,150,000 kilowatts is now under construction and designs are under way for two nuclear units of 1,152,000 kilowatts each.

By 1971, when the second nuclear unit is scheduled for service, system capacity is expected to exceed 21 million kilowatts.

TVA's engineers already are anticipating the day when the region's power requirements will reach 50 million kilowatts, and the facilities TVA is building are designed with a 50-million-kilowatt-system in mind.

Load growth is one of the most important factors any electric system considers in deciding the kinds of generating facilities it should install. A combination of large total loads and rapid load growth permits the economies of scale that come from large individual generating units, the concentration in one plant of several such units, and extra-high-voltage transmission.

Large scale operations are especially important in the evaluation of nuclear power plants because the investment cost per kilowatt of capacity and the operating cost per kilowatt-hour decline much more rapidly as size increases for nuclear plants than for plants that burn a fossil fuel.

Economies of scale are so very important that there is a trend toward the pooling of interests among otherwise independent systems, in which two or more systems share the use of facilities that might be too large for the systems individually.

System Economics

The generating capacity available to an electric system must always be greater than its anticipated loads. Reserve generating capacity

is needed so units may be removed from service for scheduled maintenance, and to meet unexpected outages and unexpected load growth.

It may be helpful to our discussion to note something of the way an electric system meets its loads.

Figure 3 shows typical hourly load curves for a week in winter, which is the season of TVA's peak loads, and for a week in spring, which is an off-peak season. On the TVA system, as on all systems, loads vary from hour to hour, from day to day, and from season to season, so that generating units are operated for varying proportions of the time. Some capacity must be operated at all times to meet the minimum loads but some is operated intermittently and for relatively short periods to assist in meeting the peak loads.

Figure 4 is an Annual Load Duration Curve. It is derived by arranging each of the hourly loads in a year from left to right in descending order. The chart has been simplified by drawing a straight line to depict the load duration, when in reality it is a curve. Shown on the chart is the generating capacity used to carry the loads.

The chart shows that about 8 million kilowatts of generating capacity, mostly steam but some hydro, operate 100 percent of the time; roughly 11 million kilowatts, or more, operate about 50 percent of the time; and 14 million kilowatts, or more, operate for shorter periods to meet peak loads.

The load under the duration curve is supplied by the hydro and thermal plants in such a way as to minimize system operating costs. The hydro units, because of their quick starting and stopping ability, are operated the maximum extent possible to utilize the available water for supplying the peak or variable portion of the load. The thermal units with the lowest incremental operating costs are operated the highest percentage of the time and, therefore, are shown supplying the base portion of the load; those with the higher incremental costs operate fewer hours and supply intermediate loads. The highest-cost thermal units operate only during hours of peak load or during emergencies.

The amount of coal burned depends on two elements in this chart: first, the proportion of coal-fired plants that make up the system capacity; and, second, the percentage of time during which the coal-fired plants are operated.

This simplified chart does not show the use of economy and emergency interchange with adjacent electric systems, but TVA does exchange power with other systems, and these exchanges offer significant savings.

TVA's purpose, and the purpose of the neighboring systems with which it interchanges power, is to operate at all times the most economical plants on all systems. In addition to the day-to-day and week-to-week economy exchanges, TVA exchanges large amounts of power seasonally with systems to the south and west.

TVA delivers large blocks of power to them during the summer months which is returned by them to TVA during the winter months. In effect, TVA generates on its own system all of the annual energy required by its annual load.

TVA's large transmission network permits wide flexibility in the choice of generating units to supply the loads. This interchangeability of generation permits use of the most economical power sources to minimize system costs.

Alternatives to Meet Load Growth

Figure 5 is the same load duration curve, except that one year's growth has been added. To show how TVA might use hydro and steam capacity to meet load growth, the portion represented by that growth has been sandwiched between the hydro and steam generation.

What are the alternatives open to TVA in meeting that growth?

Enough additional capacity--in kilowatts--including appropriate reserves, must be added to meet this added peak load as shown along the left edge of the chart; and enough electric energy during the year--in kilowatt-hours--to meet the total energy represented by the load growth band.

There are several ways to provide this capacity. One is to install plants that operate only during peak periods, supplying the bulk of the added energy requirements from existing plants. (See Figure 6) This method can be advantageous if the capacity from the peaking plant has a low capital cost even though it might have a

relatively high operating cost. Peaking capacity can be in the form of hydroelectric projects and various types of fossil-fired generating plants. Some of these plants can be erected at a cost which is only two-thirds to three-fourths the cost of a base-load plant of equal capacity. Since a peaking plant is designed to operate only a small part of the time, the added investment for equipment to gain the extra ounce of efficiency so valuable in a base-load plant is saved. Thus, the incentive is to minimize use of the peaking plant and to increase the use of existing thermal plants.

One type of peaking plant is the pump-storage hydro plant, in which water is pumped uphill to a storage reservoir during off-peak hours for use in driving generators during peak hours. TVA has been considering for some time such a plant that could produce at least a million kilowatts of capacity on peak, (roughly one year's load growth), and modest amounts of energy. To supply the energy portion of the load growth, TVA would have to operate existing coal-fired steam plants a greater portion of the time. Because even the energy attributed on this chart to the pump-storage peaking plant originates in a coal-fired plant, a pump-storage hydro plant would increase coal purchases enough to meet the entire load growth.

Another way to meet load growth is to construct a base-load thermal plant, either coal-fired or nuclear. A new, base-load thermal plant would produce kilowatt-hours at a lower incremental cost than any of the older capacity shown on the chart as operating

less than 100 percent of the time. For that reason, it would operate a high percentage of time, displacing in part generation at the older higher-cost plants so that the amount of energy it produces would be greater than needed to meet load growth alone. Figure 7 shows the total energy that would be produced at a new base-load plant, and the extent to which this generation would replace energy produced at older and higher-cost, coal-fired plants.

The effect of a new thermal, base-load plant on coal purchases will depend, of course, upon whether it is coal-fired or nuclear. If it is coal-fired, system coal burn will increase considerably. To the extent that the new plant burns coal to meet that portion of the load that previously was served by older coal-fired plants, the coal burn may be slightly less due to the better heat rate of the new plant; but the operation of the plant to meet load growth will result in a substantial increase in coal burn. However, if the new, base-load plant is nuclear, coal burn will not only fail to grow as loads grow, but there will be a net reduction in system coal burn.

The decision to build a peaking plant or a base-load plant depends upon which combination leads to the lowest overall costs projected over the life of the new plant. That is, the capital cost of the peaking plant added to the present worth of the operating costs of it and the older coal-fired plants over the life of the peaking plant must be compared to the capital cost of the base-load plant

plus the present worth of its operating costs less the savings in operating costs of the older coal-fired plants.

I would like to emphasize that the factors governing the decision to construct a new plant are different from the factors governing the decision to run that same plant after it is in service. Before a plant is built it must show a lower total cost--including the investment in the plant and transmission, and operating and maintenance expense. But once it is built the plant's relative incremental operating and maintenance expense, which is 85 percent fuel, determines the extent to which the plant is operated.

Nuclear Versus Coal-Fired, Base-Load Unit

Nuclear power plants and coal-fired plants both generate electricity by producing steam to drive turbogenerators. The essential difference between the two is that one uses nuclear fission in supplying the heat to produce the steam and the other burns coal.

A question that continues to be raised is "At what price levels will coal be competitive with nuclear fuel?" This question was reemphasized after General Electric and Westinghouse made their nuclear proposals to TVA, so a review of the evaluation which TVA made may be useful.

Because TVA's evaluation report has been in wide demand, and most of you may have copies, the review will be brief.

TVA's evaluation compares the cost of a coal-fired plant assumed to be located near Cumberland City, Tennessee, which is about 50

miles northwest of Nashville on the Cumberland River, with the cost of a nuclear plant located at Browns Ferry near Decatur, Alabama.

In choosing the most economical location of a coal-fired plant, two important factors are the delivered cost of coal, including the cost of transporting it from the mine to the plant, and the cost of transmitting the power from the plant to the load centers in which the added power supply is needed. A third factor occurs when, as in the TVA area, the lowest cost coal seldom occurs in an area where there is adequate condensing water, so that a mine-mouth plant may require an investment in cooling towers, as at TVA's Paradise Steam Plant. There is adequate condenser cooling water at Cumberland City, and no cooling towers would be needed.

Thus, in locating a coal-fired plant, we seek the lowest combination of (1) the cost of coal, including its transportation; (2) the cost of transmitting power; and (3) the plant investment, including, if needed, the cost of cooling facilities. Because of the importance of the cost of transporting coal, it is desirable to choose a site that can be served by barge, rail, and truck.

In picking a site for a nuclear plant, because the cost of transporting nuclear fuel is relatively small, the distance from the fuel supplier to the plant is a less significant consideration than for coal. The fuel can be chosen through competitive bids from sources that may be widely dispersed geographically. Among the

important variables in siting a nuclear plant are the cost of transmission and the cost of any cooling facilities. Because adequate condensing water is available in widely dispersed sites in the TVA area, a nuclear power plant can be located very close to the loads it will supply, thereby holding the cost of transmission facilities to a minimum.

The Cumberland City site offered the best combination of costs for the coal-fired plant to serve the load growth TVA needed to supply. And the Decatur area offered the best site for the nuclear plant. The Browns Ferry site was nearer to where a new source of power was needed in 1970 than the Cumberland City site.

Figure 8 summarizes the main items of the comparisons of the three alternatives. In choosing among alternatives, it is sufficient to measure the cost of energy delivered to the transmission system from the alternatives. Other system costs, involving capacity margins, transmission, marketing, and administrative costs, which are common to each alternative, need not be included. Note that in the comparisons there were some differences in the generating capacities of the three plants. TVA wanted bids on units of about one million kilowatts, but encouraged each manufacturer to choose the most economical unit he could offer in this size range.

The heat rates vary among the three plants from 8,946 Btu/kwh for the coal-fired plant to 10,558 for the boiling water reactor, which is the one TVA chose to build. The heat rate of the coal-fired plant is lower than the heat rate of the nuclear plant because it uses higher steam pressures and temperatures and pro[illegible]

for reheating the steam. Fuel costs ranged from a low of 11.86 cents a million Btu for the B&W plant to a high of 18.90 cents a million Btu for the coal-fired plant.

The fuel costs shown here have been levelized for the first twelve years of operation, the period over which the cost of the nuclear fuel was guaranteed to TVA. The levelized fuel cost is the uniform annual cost which has the same present value as the variable costs of the proposals.

The estimated capital cost per kilowatt of capacity for the nuclear plant TVA chose to build is about the same as the coal-fired plant--$116 compared with $117. One reason the costs were so close is the large size of the units. It has taken years of technological development and cost cutting to reduce the cost of large, coal-fired plants and it is significant that the cost of nuclear plants, which are practically in their infancy and for which substantial future improvements in design and economies in erection seem highly likely, already are no higher in cost than coal-fired plants.

Approximately two-thirds of the estimated total direct cost of the nuclear plant is for equipment being supplied by the manufacturer under a firm contract price that is not subject to escalation, whereas only about 14 percent of the estimated total direct cost of the coal-fired plant is based on firm bids. This lends assurance to the adequacy of the estimates and is very important in times such as these, when costs are rising so steadily.

The lower investment in transmission facilities required by the nuclear power plant reflects the point already mentioned, that the Browns Ferry site is located somewhat nearer the area on our system where additional power supply is needed in 1970 than is the Cumberland City site.

Fixed charges for interest and depreciation are much the same for all three plants. In all cases, interest at 4½ percent and an economic life of 35 years were used.

The cost of fuel to produce a kilowatt-hour of electric energy is the product of the plant heat rate and the price which must be paid for the fuel, including interest cost on fuel inventory. In TVA's evaluation, the advantage which the coal-fired plant enjoyed in its heat rate was more than offset by the relatively higher cost of the coal, with the result that the BWR nuclear plant is estimated to produce a kilowatt-hour of electric energy for 1.25 mills for fuel compared with 1.69 mills for the coal-fired plant. These costs include an allowance for interest on the fuel inventory, which, for the nuclear power plant, makes up about 10 percent of the total fuel cost and which, for the coal-fired plant, makes up about 1 percent.

Not only are fuel costs lower for the nuclear plant, they have the added advantage to TVA of being more certain than the coal costs of the coal-fired plant. The coal bids provided for escalation of price beginning with the date of the bid and are based partly on the U. S. Bureau of Labor Statistics Wholesale Price Index and

partly on a labor and material index; escalation on the nuclear fuel for the BWR plant will not start until 1975, about nine years from now; and even then it is based wholly on the Wholesale Price Index which in the past has increased much less than indexes directly related to labor and material costs.

Operating and maintenance costs of the nuclear plant include special costs that do not arise with a coal-fired plant, including the disposal of all radioactive materials. But these special costs are more than offset by the much higher operation and maintenance costs of the coal-handling facilities in a coal-fired plant. A staff of about 150 people is estimated for the nuclear power plant compared with about 250 for the coal-fired plant; most of the difference is for the operation and maintenance of coal-handling equipment.

In summary, the total cost of energy from the boiling water reactor plant delivered to the transmission system is estimated to be 2.39 mills a kilowatt-hour compared with 2.90 mills for energy from the lowest cost coal-fired plant that would meet system needs. The savings are estimated to be equivalent to $8 million a year during the first 12 years of operation, with the possibility of higher annual savings after this initial operating period.

Conclusion

In closing, it should be emphasized that TVA has no special preference between coal-fired and nuclear plants for producing electric power. TVA's interest is to use the power supply facilities which result in

the lowest cost so it may continue to fulfill its responsibility to serve electric consumers at the lowest possible rates.

True, TVA has a particular responsibility for multipurpose water control projects which provide many benefits, including flood control, navigation, municipal and industrial water supply, recreation, and hydroelectric power. A combination of thermal and hydro power is highly advantageous for a regional power supply. TVA has owned coal-fired generating capacity since the day it started operations. When opportunities for further economical hydro power development became minimal, it added to its coal-fired capacity to meet load growth.

Today, nuclear power offers an alternative to coal-fired thermal plants and portends to be an even stronger competitor for meeting future power needs. We expect that coal will leave no economic stone unturned in meeting that challenge. TVA will continue as in the past to evaluate and to compare before deciding on future plants.

With those of you who produce coal and those who transport it, TVA has a mutual interest. It is to keep the delivered cost of coal competitive.

TVA expects to continue to cooperate with the coal industry, with railroads, and with barge and truck lines to work toward this mutual interest so TVA may best fulfill its responsibility to the electric consumer of this region.

* * *

DEFENDANT'S EXHIBIT 136

Caution: Commonwealth Edison is hazardous to your health

Commonwealth Edison Company is the biggest coal user in the city, currently consuming over 3,900,000 tons of coal a year. This results in an annual discharge of over 234,000 tons of deadly sulphur dioxide into Chicago's air.

Edison has opposed the enforcement of the 1969 Chicago ordinance requiring reduction in the level of sulphur in fuels used in Chicago.

Commonwealth Edison's official position is callously indifferent to the public interest:

Edison's Public Statement
Edison intends to comply with the ordinance deadlines which existed prior to the extension.

Fact
Wrong. Even before the City Council extended the compliance deadline, Edison had sought an administrative exemption from the low-sulphur limitation. Under Edison's own proposals, Edison will be consuming 2.1 million tons of high-sulphur coal in 1969 with a resultant discharge of 147,000 tons of sulphur dioxide into Chicago's atmosphere.

Edison's Public Statement
Low-sulphur coal is not available in Illinois.

Fact
In 1968 Peabody Coal Company agreed to mine low-sulphur coal reserves near Troy, Illinois. Peabody has since abandoned its proposal. Yet Peabody continues to be a major supplier of Edison's coal needs. Why didn't Edison use its economic leverage against Peabody to demand low-sulphur coal from Peabody? New York's Consolidated Edison demanded and is now receiving coal with a less than 1% sulphur content from its suppliers. In addition, 3 out of 4 Edison generating stations in Chicago have natural gas capacity. Why doesn't Edison ask the gas utilities to supply gas power on a full-time basis?

Edison's Public Statement
Edison is doing everything it can to combat air pollution.

Fact
Wrong. Edison's generating plants pour thousands of tons of particulate matter into Chicago's atmosphere every year. Edison's present air pollution control devices (precipitators) are highly inefficient by current technological standards. If Edison persists in using high sulphur coal it could at least provide more efficient precipitators.

We, The Hyde Park-Kenwood Community Conference, on behalf of the citizens of Chicago want to know what Edison will do to meet next year's compliance deadline. Will next year bring a new extension demand or will Edison comply with the sulphur limitations?

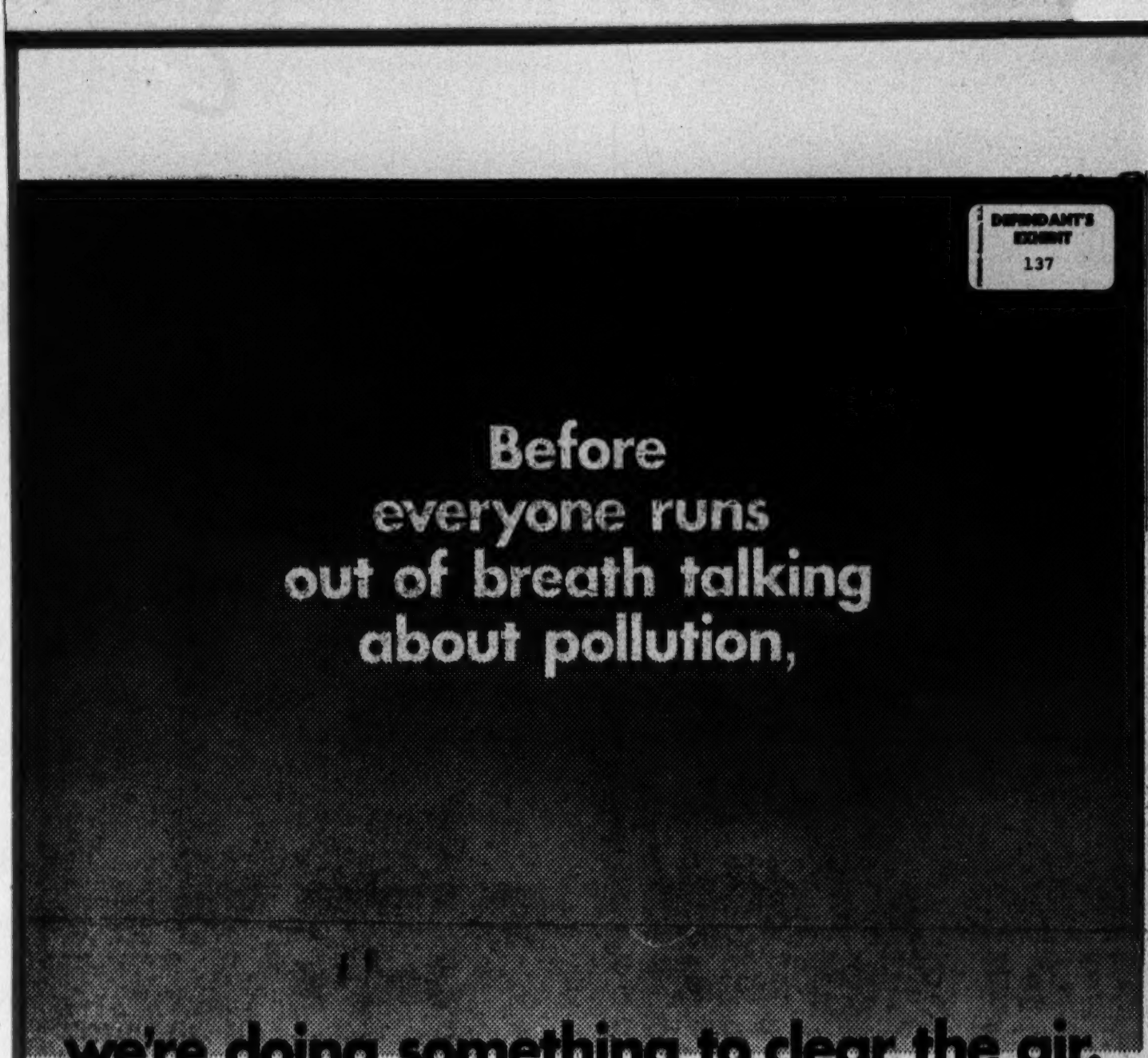
We await Edison's reply.

The Hyde Park-Kenwood Community Conference

5200 South Harper, Chicago, Illinois 60637
KAI NEBEL, Chairman

DEFENDANT'S EXHIBIT 137

Before everyone runs out of breath talking about pollution,



we're doing something to clear the air.

Gas is the cleanest energy there is anywhere. It's cleaner to produce and cleaner to use than coal, oil or gasoline.

IN CHICAGO

Most Chicago residents use natural gas for heating, cooking, clothes drying and water heating. And it's a plain fact that the more Chicago uses gas for these purposes, the cleaner our air will be.

Commonwealth Edison Company is one of our customers. Our sales to Edison during the past year totaled about 241 million therms of gas, more than triple the quantity they bought from us four years ago. The gas we sold them replaced 1.19 million tons of coal for making electricity, and eliminated 83,100 tons of sulphur dioxide from the air.

During the last six years, our sales to Edison totaled more than 846 million therms. It replaced 4.1 million tons of coal and eliminated 290,500 tons of sulphur dioxide from the air we breathe.

Gas-fired incinerators and fume incinerators are now being used by commercial, industrial and residential customers to dispose of waste materials and eliminate obnoxious odors. More of this equipment is being installed every year.

LOOK AT THE RECORD

In Chicago alone since January 1, 1964, gas has replaced coal and oil-burning equipment for commercial, industrial and residential purposes at a steadily increasing rate. Those replacements are now eliminating about 200,000 tons of sulphur dioxide pollution from the air each year.

GAS SUPPLY

We have repeatedly pointed out, that because of physical and economic limitations, natural gas alone cannot solve the total problem. Nevertheless, Peoples Gas is doing everything in its power to decrease air pollution by increasing the use and supply of natural gas.

During the past six years, Peoples Gas has spent 512 million dollars to build additional pipelines and increase its underground storage capacity. On January 1, 1964 our system's daily delivery capacity was 2.8 billion cubic feet. Now it is 4.9 billion cubic feet—the equivalent of 233,000 tons of coal or 32 million gallons of oil per day.

PLANS FOR 1970

In the coming year, we plan to spend 51 million dollars more to expand our supply and storage system. That will increase the supply of natural gas by an additional 528 million cubic feet per day—for even more clean air.

Peoples Gas

DX 138

STEAM-ELECTRIC PLANT FACTORS

1969 EDITION

(Fuel Consumption and Costs, Plant Capacity, Net Generation, 1968, and Planned Capacity, 1969-1975.)

AN ANNUAL STUDY BY THE DIVISION OF ECONOMICS AND STATISTICS

Nineteenth Edition, November 1969
Copyright, National Coal Association, 1969

* * *

NATIONAL COAL ASSOCIATION
1130 Seventeenth St., N.W.
Washington, D.C. 20036

Price: $20.00
Foreign Mailings: $25.00

Line No.	City	Company	Plant	Installed Generating Capacity (Thous. K-w)*	Net Generation (Million K-w.h)*	Fuel Designed For: C-Coal S-Stoker P-Pulv'd. O-Oil G-Gas	Coal: Tons (Thous.)	Coal: Cost per Ton F.O.B. Plant	Oil: Barrels (Thous.)	Oil: Cost per Barrel F.O.B. Plant	Oil: Cost per Barrel As Burned	Oil: BTU per Gallon	Gas: Million Cubic Feet	Gas: Cost as Burned (¢-MCF)	Gas: BTU per Cubic Foot	Cost per Million BTU (Cents) F.O.B. Plant* Coal	Cost per Million BTU (Cents) As Burned Coal	Cost per Million BTU (Cents) As Burned Oil	Cost per Million BTU (Cents) As Burned Gas	Percent of Consumption in B.T.U. Coal	Percent of Consumption in B.T.U. Oil	Percent of Consumption in B.T.U. Gas	Line No.
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
WEST NORTH CENTRAL - Cont'd																							
IOWA - Cont'd																							
38	Spencer	Corn Belt Power Cooperative	Wisdom	37.5	162.0	C(P)G	30	$6.39	-	$ -	$ -	-	1,427	28.1	1,000	33.3	33.3 5/	-	28.1	29	-	71	38
39	Montpelier	Eastern Iowa Light & Power Coop.	Montpelier	35.0	237.0	C	107	6.30	3	na	4.32	138,000	-	-	-	24.7	25.4	74.5	-	99	1	-	39
40	Creston	Southwestern Federated Power Coop.	Creston #2 13/	22.5	-	OG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
		TOTAL IOWA		2,729.3	11,196.4		3,175	5.67	105	4.22	4.22	141,880	64,411	26.7	1,020	26.5	27.4	72.7	26.2	51	-	49	
	KANSAS																						
1	Colby	Central Kansas Power Company	Colby	12.0	63.3	OG	-	-	7	4.21	4.12	150,000	1,047	22.1	948	-	-	65.5	23.3	-	4	96	1
2	Hays	"	Hays	19.0	64.1	OG	-	-	7	4.37	4.32	150,000	1,047	24.0	959	-	-	68.6	25.0	-	4	96	2
3	Hills City	"	Ross Beach #1	12.7	71.1	OG	-	-	5	4.36	4.27	150,000	1,045	22.1	948	-	-	67.7	23.3	-	3	97	3
4	Hills City	"	Ross Beach #2	22.0	175.0	OG	-	-	13	4.36	4.27	150,000	2,254	22.1	948	-	-	67.7	23.3	-	4	96	4
5	Liberal	Central Telephone & Utls. Corp. 38/	Cimarron River	73.6	360.4	G	-	-	-	-	-	-	4,301	36.5	1,027	-	-	-	35.5	-	-	100	5
6	Concordia	"	Concordia	8.0	2.5	OG	-	-	-	-	-	-	50	na	1,000 7/	-	-	-	na	-	-	100	6
7	Dodge City	"	Fort Dodge	30.8	146.7	G	-	-	4	4.30	4.34	150,000	1,983	21.0	1,003	-	-	68.9	20.9	-	1	99	7
8	Great Bend	"	A. Mullergren	133.5	585.3	G	-	-	15	4.00	4.01	150,000	6,763	24.4	967	-	-	63.7	23.2	-	1	99	8
9	Riverton	Empire District Electric Co.	Riverton	155.0	744.3	G(P)OG	36	5.80	30	2.11	2.23	155,000	7,568	22.6	1,042	22.7	24.3	34.2	21.7	10	2	88	9
10	Wichita	Kansas Gas & Electric Company	Gordon Evans	539.3	2,603.3	OG	-	-	11	na	1.39	147,249	26,358	21.2	982	-	-	22.4	21.6	-	-	100	10
11	Wichita	"	Murray Gill	348.3	1,787.1	OG	-	-	16	na	1.38	149,714	18,445	21.9	1,013	-	-	22.0	21.6	-	1	99	11
12	Parsons	"	Neosho	113.5	191.8	C(S)OG	0.1	na	23	na	2.37	150,857	2,195	25.2	1,039	na	24.4	37.3	24.3	-	6	94	12
13	Wichita	"	Ripley	87.3	142.1	OG	-	-	15	na	1.34	143,786	1,836	22.5	1,031	-	-	22.1	21.8	-	5	95	13
14	Wichita	"	Wichita	20.0	(0.6)	OG	-	-	-	-	-	-	24	na	1,000 7/	-	-	-	21.0	-	-	100	14
15	Abilene	Kansas Power & Light Company	Abilene	33.8	34.7	OG	-	-	9	2.47	2.45	150,000	452	24.1	987	-	-	38.9	24.4	-	11	89	15
16	Hutchinson	"	Hutchinson	252.2	1,265.9	OG	-	-	49	2.23	2.64	154,000	13,273	24.1	1,027	-	-	41.6 5/	23.5	-	2	98	16
17	Lawrence	"	Lawrence	210.2	957.8	COG	59	5.89	8	2.82	2.49	144,299	8,729	23.2	1,029	24.2	25.5	41.6 5/	22.6	14	-	86	17
18	Tecumseh	"	Tecumseh	346.1	1,501.6	COG	80	5.85	7	2.77	2.87	147,501	13,931	23.3	1,035	23.8	25.2 5/	43.9 5/	22.5	12	-	88	18
19	Anthony	Anthony, City of	Anthony 7/	5.8	14.2	G	-	-	-	-	-	-	235	na	1,050 4/	-	-	-	na	-	-	100	19
20	Chanute	Chanute, City of	Chanute 2/	19.0	47.4	OG	-	-	9	na	na	150,000 4/	690	na	1,000 7/	-	-	40.6	24.2	-	8	92	20
21	Clay Center	Clay Center Mun. Light & Water	Clay Center 2/	12.5	19.8	OG	-	-	1	na	na	150,000 4/	340	na	960 7/	-	-	na	na	-	2	98	21
22	Coffeyville	Coffeyville Mun. Light & Power	Coffeyville	40.3	94.7	OG	-	-	2	na	2.80 7/	144,000	1,335	24.2 7/	1,000	-	-	46.3	24.2	-	1	99	22
23	Iola	Iola, City of	Iola 2/	9.5	5.5	OG	-	-	-	-	-	-	102	na	937 7/	-	-	-	27.8	-	-	100	23
24	Kansas City	Kansas City Bd. of Public Utils.	Kaw	161.3	561.6	C(P)G	93	6.21	-	-	-	-	5,492	23.8	1,005	28.5	28.5	-	24.1 5/	27	-	73	24
25	Kansas City	"	Quindaro #2	104.5	232.6	C(P)G	19	5.91	-	-	-	-	3,006	24.1	951	23.9	23.9	-	25.8 5/	14	-	86	25
26	Kansas City	"	Quindaro #3	81.6	337.4	C(P)G	174	5.94	-	-	-	-	424	23.2	950	24.1	24.1	-	24.8 5/	91	-	9	26
27	Larned	Larned Water & Electric Dept.	Larned 2/	12.8	16.4	G	-	-	1	na	na	150,000 4/	330	na	1,050 4/	-	-	na	na	-	2	98	27
28	McPherson	McPherson Water & Electric Dept.	McPherson #1	25.5	1.7	G	-	-	-	-	-	-	37	27.9	1,500	-	-	-	27.9	-	-	100	28
29	McPherson	"	McPherson #2	32.0	124.5	G	-	-	6	2.35	2.35	139,400	1,565	24.4	960	-	-	38.2 5/	25.4	-	3	97	29
30	Ottawa	Ottawa Water & Light Department	Ottawa	6.5	0.2	OG	-	-	-	-	-	-	15	25.0	1,000	-	-	-	25.0	-	-	100	30
31	Pratt	Pratt Mun. Electric & Water Dept.	Pratt	27.8	34.9	G	-	-	2	na	na	150,000 4/	353	na	867	-	-	na	na	-	3	97	31
32	Wellington	Wellington Light Department	Wellington 7/	14.5	44.8	OG	-	-	-	-	-	-	664	na	1,050 4/	-	-	-	na	-	-	100	32
33	Winfield	Winfield Mun. Light & Power Plant	Winfield 7/	20.0	61.6	G	-	-	0.7	na	na	150,000 4/	770	na	1,050 4/	-	-	na	na	-	1	99	33
34	Garden City	Wheatland Electric Coop., Inc.	Garden City 7/	28.5	167.1	OG	-	-	17	3.94 39/	3.96 39/	137,600 7/	2,725	18.2 39/	889 7/	-	-	68.6 39/	20.4 39/	-	4	96	34
		TOTAL KANSAS		3,019.4	12,461.4		461	5.96	258	3.02	2.74	150,110	129,564	23.1	1,003	24.8	25.2	43.5	23.0	8	1	91	
	MINNESOTA																						
1	Albert Lea	Interstate Power Company	Albert Lea 2/	18.5	22.1	OG	-	-	14	na	na	150,000 4/	363	na	1,050 4/	-	-	na	na	-	19	81	1
2	Sherburn	"	Fox Lake	104.6	521.9	C(P)OG	19	8.37	211	2.40	2.41	150,684	4,041	25.8	1,011	37.3	39.4	38.1	25.6	7	23	70	2
3	Aurora	Minnesota Power & Light Co.	Aurora	116.1	637.5	C(P)	287	9.18	-	-	-	-	-	-	-	35.0	36.0	-	-	100	-	-	3
4	Cohasset	"	Clay Boswell	150.0	1,023.2	C(P)	412	9.44	-	-	-	-	-	-	-	35.7	36.0	-	-	100	-	-	4
5	Duluth	"	M. L. Hibbard	122.5	445.2	C(P)G	138	8.89	-	-	-	-	2,585	29.3	1,014	34.2	36.0	-	28.9	58	-	42	5
6	Minneapolis	Northern States Power Co. (Minn.)	Black Dog	486.7	2,580.8	C(P)G	552	6.38	2	4.53	4.41	134,200	15,292	23.6	1,013	28.4	28.2	78.2	23.3	44	-	56	6
7	St. Paul	"	High Bridge	463.2	2,565.7	C(SP)G	406	6.36	37	4.45	5.12	134,200	18,563 40/	23.7	1,013	28.2	28.3	90.8	23.4	32	1	67	7

XXX

Table 1. Steam-Electric Plant Capacity, Net [illegible] Fuel Consumption, and Unit Costs, 1963

Line No.	City	Company	Plant	Installed Generating Capacity (Thous. K-w)*	Net Generation (Million K-w-h)*	Fuel Designed For: C-Coal S-Stoker P-Pulv'd. O-Oil G-Gas	Coal: Tons (Thous.)	Coal: Cost per Ton F.O.B. Plant	Oil: Barrels (Thous.)	Oil: Cost per Barrel F.O.B. Plant	Oil: Cost per Barrel As Burned	Oil: BTU per Gallon	Gas: Million Cubic Feet	Gas: Cost as Burned (¢/MCF)	Gas: BTU per Cubic Foot	Cost per Million BTU (cents): F.O.B. Plant*	Cost per Million BTU (cents): As Burned: Coal	Oil	Gas	Percent of Consumption in B.T.U.: Coal	Oil	Gas	Line No.
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
	WEST NORTH CENTRAL - Cont'd																						
	MISSOURI - Cont'd																						
16	St. Joseph	St. Joseph Light & Power Company	Lake Road	150.5	698.5	COG	53	$7.07	4	$3.06	$3.14	151,345	9,350	21.7	974	31.9	35.6	49.4	22.3	11	-	89	16
17	St. Louis	Union Electric Company	Ashley	70.0	69.4	C(P)	81	6.10	0.7	4.07	4.01	152,000	-	-	-	26.9	27.8	62.8	-	100	-	-	17
18	St. Louis	"	Meramec	800.0	3,485.5	C(P)G	2,266	4.76	-	-	-	-	2,961 [44]	24.0	1,039	21.3	21.9	-	23.1	94	-	6	18
19	St. Louis	"	Mound	40.0	22.2	OG	-	-	19	2.99	3.00	152,000	318	24.1	1,039	-	-	43.8	23.2	-	27	73	19
20	West Alton	"	Sioux	976.0	3,500.3	C(P)O	1,464	4.52	16	3.87	3.86	137,000	-	-	-	19.9	20.0	67.3	-	100	-	-	20
21	Chillicothe	Chillicothe Municipal Utilities	Chillicothe [6] [7]	15.0	48.8	C(S)	42	na	-	-	-	-	-	-	-	na	na	-	-	100	-	-	21
22	Columbia	Columbia Water & Light Dept.	Columbia [6e]	79.2 [33]	190.0 [33]	C(S)	130	6.05	1	3.86	3.86	138,700	74	35.0	1,000	27.1	27.1	66.3	35.0	97	-	3	22
23	Fulton	Fulton Department of Utilities	Fulton [2] [6b]	11.5	28.0	C(S)	28	na	-	-	-	-	-	-	-	na	24.8	-	-	100	-	-	23
24	Hannibal	Hannibal Board of Public Works	Hannibal	34.0	72.0	C(SP)	37	7.74	-	-	-	-	124	39.5	1,000	32.3	32.2	-	39.5	88	-	12	24
25	Independence	Independence Power & Light Dept.	Blue Valley [6]	113.0	344.7	COG	17	7.78	-	-	-	-	3,706	22.8	949	32.5	32.5	-	24.1	10	-	90	25
26	Independence	"	Bodgion Street [6]	15.5	-	OG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
27	Macon	Macon Municipal Utilities	Macon [7]	5.0	6.8	OG	8	na	-	-	-	-	-	-	-	na	na	-	-	100	-	-	27
28	Marshall	Marshall Municipal Utilities	Marshall [7]	30.5	53.7	OG	4	na	-	-	-	-	690	na	1,000 [7]	na	na	-	na	11	-	89	28
29	Poplar Bluff	Poplar Bluff Bd. of Public Works	Poplar Bluff	14.5	21.8	C(S)OG	0.8	7.48	-	-	-	-	432	28.9	1,000	32.5	32.5	-	28.9	4	-	96	29
30	Springfield	Springfield Utilities	James River [6]	148.0	644.0	CG	20	7.66	-	-	-	-	6,604	22.4	1,011	31.2	31.5	-	22.2	7	-	93	30
31	Springfield	"	Main Street [6]	20.0	-	OG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
32	Randolph Co.	Associated Electric Cooperative	Thomas Hill [7]	175.0	1,180.0	C [3]	523	4.26 [39]	-	-	-	-	-	-	-	20.0	3920.5 [39]	-	-	100	-	-	32
33	Chamois	Central Electric Power Coop.	Chamois	59.0	385.6	C(P) [3]	186	5.79	-	-	-	-	-	-	-	25.4	25.6	-	-	100	-	-	33
34	Missouri City	Northwest Elec. Power Coop., Inc.	Cameron	40.0	150.7	C(P)O	90	6.60	3	na	na	150,852	-	-	-	29.1	29.5	na	-	99	1	-	34
35	Palcyra	Northeast Missouri Elec. Pwr. Coop.	South River [7]	15.0	27.8	C	21	na	-	-	-	-	-	-	-	na	na	-	-	100	-	-	35
		TOTAL MISSOURI		4,320.8	18,285.1		7,167	4.71	58	3.54	3.58	145,250	43,635	23.1	971	21.7	22.1	58.9	23.8	79	-	21	
1	NEBRASKA																						1
1	Alliance	Alliance, City of	Alliance	16.5	22.5	C(S)G	1	na	-	-	-	-	391	na	1,095 [7]	na	na	-	28.4	5	-	95	1
2	Fairbury	Fairbury Light & Water Dept.	Fairbury [2] [6]	21.0	30.0	OG	-	-	3	na	na	150,000	415	na	900 [7]	-	-	na	na	-	5	95	2
3	Fremont	Fremont Dept. of Utilities	Fremont No. 1 [2]	21.0	49.0	C(S)G	6	8.04 [7]	-	-	-	-	670	27.5 [7]	1,000 [7]	32.2	33.2 [5]	-	27.5	18	-	82	3
4	Fremont	"	Fremont No. 2	41.2	143.0	CG	9	8.04	-	-	-	-	1,641	27.5	1,000	32.2	33.2 [5]	-	27.5	12	-	88	4
5	Grand Island	Grand Island Mun. Light System	C. W. Burdick [6c]	38.5	122.8	OG	-	-	3	3.28	3.29	151,000	1,643	27.0	955	-	-	51.9	28.3	-	1	99	5
6	Grand Island	"	Pine Street [6c]	12.5	19.3	OG	-	-	0.8	3.29	3.29	151,000	365	27.0	955	-	-	51.9	28.3	-	1	99	6
7	Hastings	Hastings Utilities	Hastings	54.0	90.0	OG	-	-	5	3.36	3.36	153,000	1,316	27.3	950	-	-	52.3	28.7	-	3	97	7
8	Lincoln	Lincoln Commercial Light Dept.	A Street [6d] [2]	8.9	16.6	C(SP)OG	1	na	0.3	na	na	150,000 [4]	366	na	1,050 [4]	na	32.1	48.2	27.8	6	-	94	8
9	Schuyler	Schuyler Dept. of Utilities	Schuyler [7]	9.0	9.0	OG	-	-	2	na	na	130,000 [4]	133	na	1,050 [4]	-	-	na	na	-	7	93	9
10	Lexington	Cent. Nebr. Pub. Pwr. & Irrig. Dist.	Canaday	108.8	458.5	OG	-	-	13	2.96	2.96	150,000	4,827	27.1	962	-	-	46.9	28.7	-	2	98	10
11	Scottsbluff	Consumers Pub. Power Dist. [45]	Bluffs	42.2	174.3	OG	-	-	2 [46]	na	2.44	151,848	2,142	23.2	1,073	-	-	38.2	21.7	-	1	99	11
12	Ogallala	"	Ogallala [2]	7.5	25.2	OG	-	-	0.5	na	na	150,000 [4]	422	na	961 [7]	-	-	na	na	-	1	99	12
13	Hallam	"	Sheldon	227.8	774.5	CG	83	na	-	-	-	-	6,092	26.0	1,010	na	31.6	-	25.6	25	-	75	13
14	Lincoln	Nebraska Public Power System	K Street	29.3	34.3	C(P)OG	5	7.89	4	3.26	3.26	149,848	811	27.7	1,005	30.5	30.4	51.8	27.6	13	3	84	14
15	Bellevue	"	Kramer	112.5	339.2	C(P)G	48	7.59	-	-	-	-	3,272	26.3	1,012	30.6	30.6	-	26.0	26	-	74	15
16	Omaha	Omaha Public Power District	Jones Street	160.0	47.5	C(SP)G	9	7.33	-	-	-	-	558	26.2	1,021	31.0	32.8 [5]	-	25.8	27	-	73	16
17	Omaha	"	North Omaha	600.0	2,787.0	C(P)G	371	7.29	-	-	-	-	19,101	26.2	1,021	30.0	30.9	-	25.7	32	-	68	17
18	Omaha	"	South Omaha	30.0	49.6	OG	-	-	6	3.33	3.45	151,836	237	26.7	1,021	-	-	54.2	26.2	-	13	87	18
		TOTAL NEBRASKA		1,530.7	5,212.3		533	7.35	40	3.17	3.15	150,914	44,441	26.3	1,006	30.2	31.1	49.6	26.2	23	-	77	
1	NORTH DAKOTA																						1
1	Beulah	Montana-Dakota Utilities Company	Beulah [2]	13.5	40.7	C(S)	64 [42]	na	-	-	-	-	-	-	-	na	14.7	-	-	100	-	-	1
2	Hanton	"	Heskett	100.0	510.7	C(S)G	467 [42]	na	-	-	-	-	-	-	-	na	30.0	-	-	100	-	-	2
3	Williston	"	Williston [2]	2.0	(0.1)	OG	-	-	-	-	-	-	13	na	1,050 [4]	-	-	-	30.4	-	-	100	3
4	Minot	Northern States Power Co. (Minn.)	Bison [2]	10.0	10.7	C(S)	41	na	-	-	-	-	-	-	-	na	25.4	-	-	100	-	-	4
5	Fargo	"	Fargo [2]	20.0	22.6	C(S)	10	na	-	-	-	-	-	-	-	na	31.7	-	-	100	-	-	5
6	Grand Forks	"	Grand Forks [2]	16.0	30.9	C(S)	59	na	-	-	-	-	-	-	-	na	31.1	-	-	100	-	-	6
7	Devils Lake	Otter Tail Power Company	Devils Lake [2]	12.5	29.1	C(S)	55 [42]	na	-	-	-	-	-	-	-	na	36.0	-	-	100	-	-	7

xxx

Table 6. The Other Plants or Units Planned or Under Construction, 1969-1975: Hydro-Electric, Internal Combustion and Gas Turbine

CITY	COMPANY	PLANT	N-NEW E-EXISTING PLANT	TYPE OF PLANT 1	1969 NAMEPLATE 2	1969 DEPENDABLE 3	1970 NAMEPLATE 2	1970 DEPENDABLE 3	1971 NAMEPLATE 2	1971 DEPENDABLE 3	1972 NAMEPLATE 2	1972 DEPENDABLE 3	1973 CAPACITY 4	1974 CAPACITY 4	1975 CAPACITY 4
NEW ENGLAND															
CONNECTICUT															
1. Branford	Connecticut Light & Power Company	Branford #1	N	GT	20,400	20,400	-	-	-	-	-	-	-	-	-
2. Unassigned	"	Cos Cob #1 - 3	N	GT	68,700 7	68,000	-	-	-	-	-	-	-	-	-
3. Enfield	"	Enfield #1	N	GT	20,400	20,400	-	-	-	-	-	-	-	-	-
4. Erving	"	Northfield #1 - 4	N	H	-	-	-	-	750,000 6 8	750,000	250,000 4	250,000	-	-	-
5. na	"	Tunnel #3	N	GT	20,400	20,400	-	-	-	-	-	-	-	-	-
TOTAL CONNECTICUT				GT	129,900	129,200	-	-	-	-	-	-	-	-	-
				H	-	-	-	-	750,000	750,000	250,000	250,000	-	-	-
MASSACHUSETTS															
1. Boston	Boston Edison Company	Edgar #J1, J2	E	GT	7,500	8,250	-	-	-	-	-	-	-	-	-
2. Framingham	"	Framingham #1 - 3	N	GT	50,250 9	51,000	-	-	-	-	-	-	-	-	-
3. Everett	"	Mystic	E	GT	100,500 10	100,000	-	-	-	-	-	-	-	-	-
4. na	"	W. Medway #1 - 3	N	GT	-	-	[illegible]00 4	220,000	-	-	-	-	-	-	-
5. Marthas Vineyard	Cape & Vineyard Electric Company	Vineyard #1 & 2	N	IC	5,500	6,000	-	-	-	-	-	-	-	-	-
6. Somerset	Eastern Utility Associates	Somerset	N	GT	-	-	[illegible],00	22,000	-	-	-	-	-	-	-
7. Provincetown	New Bedford Gas & Edison Light Co.	Provincetown	N	IC	2,750	3,000	-	-	-	-	-	-	-	-	-
8. na	New England Power Company	Bear Swamp	N	H	-	-	-	-	-	-	-	-	-	600,000	-
9. Salem Harbor	"	Salem Harbor	E	GT	-	-	[illegible]00	16,000	-	-	-	-	-	-	-
10. Uxbridge	"	Uxbridge #1 & 2	N	GT	-	-	[illegible]00	46,000	-	-	-	-	-	-	-
11. na	Western Massachusetts Electric Co.	Doreen #1	N	GT	20,400	20,400	-	-	-	-	-	-	-	-	-
12. Pittsfield	"	Silver Lake	N	GT	80,200	80,200	-	-	-	-	-	-	-	-	-
13. na	"	Woodland Road #1	N	GT	20,400	20,400	-	-	-	-	-	-	-	-	-
TOTAL MASSACHUSETTS				GT	278,750	280,250	[illegible]00	304,000	-	-	-	-	-	-	-
				H	-	-	-	-	-	-	-	-	-	600,000	-
				IC	8,250	9,000	-	-	-	-	-	-	-	-	-
NEW HAMPSHIRE															
1. na	Public Service Co. of New Hampshire	Lost Nation #1	N	GT	19,000	19,000	-	-	-	-	-	-	-	-	-
2. Manchester	"	Merrimack #4	E	GT	25,000	25,000	-	-	-	-	-	-	-	-	-
TOTAL NEW HAMPSHIRE				GT	44,000	44,000	-	-	-	-	-	-	-	-	-
MIDDLE ATLANTIC															
NEW JERSEY															
1. Atlantic City	Atlantic City Electric Company	Missouri Ave. #1 - 3	E	GT	55,800 5 11	64,800	-	-	-	-	-	-	-	-	-
2. Morris County	Jersey Central Power & Light Co.	Longwood #1, 2 & 3	N	H	-	-	-	-	121,500 6 12	130,000	-	-	-	-	-
3. Holland Township	Metropolitan Edison Company	Gilbert Riegal	N	GT	-	-	125,000 4	125,000	-	-	-	-	-	-	-
4. Kearny	Public Service Electric & Gas Co.	Kearny #10 & 11	E	GT	230,400 13	280,000	-	-	-	-	-	-	-	-	-
5. Linden	"	Linden	E	GT	-	-	-	-	80,000	80,000	-	-	-	-	-
6. Rio Grande	"	Middle	N	GT	-	-	[illegible]00	48,000	-	-	-	-	-	-	-
7. Lower Alloway	"	Salem	N	GT	-	-	-	-	40,000	40,000	-	-	-	-	-
8. na	"	Unassigned	N	GT	-	-	115,000	140,000	420,000 4	420,000	-	-	-	-	-
TOTAL NEW JERSEY				GT	286,200	344,800	[illegible]00	313,000	540,000	540,000	-	-	-	-	-
				H	-	-	-	-	121,500	130,000	-	-	-	-	-
NEW YORK															
1. South Cairo	Central Hudson Gas & Electric Co.	Copsackie	N	GT	21,600	24,000	-	-	-	-	-	-	-	-	-
2. na	"	Saugerties #1	N	GT	-	-	21 00	24,000	-	-	-	-	-	-	-
3. na	"	Sturgeon Pool	N	H	-	-	-	-	-	-	-	-	-	-	14,400
4. New York	Consolidated Edison Co. of N.Y.	Arthur Kill	E	GT	-	-	17,000	21,000	-	-	-	-	-	-	-
5. New York	"	Astoria #2 - 4	E	GT	-	-	5[illegible]00	555,000	-	-	-	-	-	-	-
6. New York	"	Cornwall	N	H	-	-	-	-	-	-	-	-	1,800,000 6	-	-
7. New York	"	59th Street	E	GT	17,102	21,000	-	-	-	-	-	-	-	-	-
8. New York	"	Hudson Avenue	E	GT	-	-	30,000	50,000	-	-	-	-	-	-	-
9. New York	"	Indian Point	E	GT	16,575	25,000	-	-	-	-	-	-	-	-	-
10. New York	"	Kent Avenue	E	GT	14,000	15,000	-	-	-	-	-	-	-	-	-
11. Freeport	Freeport, City of	Freeport #1 & 2	N	GT	20,000	20,328	-	-	-	-	-	-	10,000	-	-
12. Island Park	Long Island Lighting Company	Barrett #1 - 8	E	GT	-	-	[illegible],00 14	168,800	-	-	-	-	-	-	-
13. na	"	East Hampton	N	GT	-	-	21,250	24,400	-	-	-	-	-	-	-
14. na	"	Inwood	N	GT	-	-	-	-	63,500	61,100	-	-	-	-	-
15. Mineola	"	Shoreham	N	GT	-	-	-	-	50,000	56,000	-	-	-	-	-
16. Albany	Niagara Mohawk Power Corporation	Albany	E	GT	165,000	180,000	-	-	-	-	-	-	-	-	-
17. Albany	"	Rotterdam	N	GT	-	-	60,000	184,000	-	-	-	-	-	-	-

Table G. The Other Plants or Units Planned or Under Construction, 1969-75: Hydro-Electric, Internal Combustion and Gas Turbine

CITY	COMPANY	PLANT	N-NEW E-EXISTING PLANT	TYPE OF PLANT 1	1969 NAMEPLATE 2	1969 DEPENDABLE 3	1970 NAMEPLATE 2	1970 DEPENDABLE 3	1971 NAMEPLATE 2	1971 DEPENDABLE 3	1972 NAMEPLATE 2	1972 DEPENDABLE 3	1973 CAPACITY 4	1974 CAPACITY 4	1975 CAPACITY 4
MIDDLE ATLANTIC - Cont'd															
NEW YORK - Cont'd															
18. Blenheim	New York State Power Authority	Blenheim-Gilboa	N	H	-	-									
19. Rochester	Rochester Gas & Electric Corporation	R. E. Ginna	N	IC	4,500	4,500	-	-	-	-	500,000	500,000	500,000	-	-
20. Rochester	"	Station #3 - 9	E	GT	36,000 15	37,500	-	-	-	-	-	-	-	-	-
					-	-	-	-	-	-	-	-	-	-	-
TOTAL NEW YORK				GT	290,277	322,823	7 850	1,027,200	113,500	117,100	-	-	10,000	-	-
				H	-	-									
				IC	4,500	4,500	-	-	-	-	500,000	500,000	2,300,000	-	14,400
							-	-	-	-	-	-	-	-	-
PENNSYLVANIA															
1. East of Warren	Pennsylvania Electric Company	Seneca #1 - 3	N	H	380,000 6 16	380,000									
2. Homer City	"	Homer City	N	IC	7,500	7,500	-	-	-	-	-	-	-	-	-
3. Newcastle	Pennsylvania Power Company	Newcastle	E	IC	6,000 5	6,000	-	-	-	-	-	-	-	-	-
4. Pottsville	Pennsylvania Power & Light Company	Fishbach #1 & 2	N	GT	37,200 17	40,000	-	-	-	-	-	-	-	-	-
5. na	"	Jenkins Laflin	N	GT	32,000	35,000	-	-	-	-	-	-	-	-	-
6. Lock Haven	"	Lock Haven #1	N	GT	18,600	20,000	-	-	-	-	-	-	-	-	-
7. na	"	Suburban	E	GT	29,250	34,000	-	-	-	-	-	-	-	-	-
8. Harrisburg	"	West Shore #1 - 2	N	GT	37,200 18	40,000	-	-	-	-	-	-	-	-	-
9. Chester	Philadelphia Electric Company	Chester	E	GT	55,800 19	64,000	-	-	-	-	-	-	-	-	-
10. Philadelphia	"	Delaware	E	GT	55,800 20	66,000	-	-	18,600	21,300	-	-	-	-	-
11. Philadelphia	"	Eddystone	E	GT	-	-	2 408	24,000	-	-	-	-	-	-	-
12. Philadelphia	"	Falls	N	GT	-	-	2 400	24,000	-	-	-	-	-	-	-
13. Philadelphia	"	Moser	N	GT	-	-	61,200	72,000	20,400	24,000	-	-	-	-	-
14. Philadelphia	"	Schuylkill	E	GT	18,600	22,000	61,200	72,000	-	-	-	-	-	-	-
15. Philadelphia	"	West Chester	N	GT	-	-	-	-	20,400	24,000	-	-	-	-	-
16. Indiana County	Public Service Electric & Gas Co.	Conemaugh	N	IC	11,000	11,000	-	-	98,800	115,600	-	-	-	-	-
17. na	"	National Park	N	GT	18,600	20,000	-	-	-	-	-	-	-	-	-
					-	-	-	-	-	-	-	-	-	-	-
TOTAL PENNSYLVANIA				GT	303,050	341,000	6 208	192,000	158,200	184,900	-	-	-	-	-
				H	380,000	380,000	-	-	-	-	-	-	-	-	-
				IC	74,500	24,500	-	-	-	-	-	-	-	-	-
							-	-	-	-	-	-	-	-	-
EAST NORTH CENTRAL															
ILLINOIS															
1. Chicago	Commonwealth Edison Company	Calumet	E	GT	220,000 21	220,000	7 300 22	76,000	-	-	-	-	-	-	-
2. Chicago	"	Electric Junction	N	GT	-	-	76,000	76,000	-	-	-	-	-	-	-
3. Joliet	"	Joliet	E	GT	147,000 23	147,000	-	-	-	-	-	-	-	-	-
4. Chicago	"	Lowhard	N	GT	132,900 24	132,900	-	-	-	-	-	-	-	-	-
5. Rockford	"	Sabrooke	E	GT	73,000 25	73,000	7 300 26	76,000	-	-	-	-	-	-	-
6. Oglesby	Illinois Power Company	Oglesby	N	GT	-	-	7 210	70,210	-	-	-	-	-	-	-
7. Stallings	"	Stallings	N	GT	-	-	108,000	100,000	-	-	-	-	-	-	-
8. Moline	Iowa-Illinois Gas & Electric Co.	Moline #1 - 4	E	GT	-	-	72,600 27	72,600	-	-	-	-	-	-	-
9. Marion	Southern Illinois Power Co-op.	Marion	E	GT	-	-	-	-	-	-	-	-	-	-	40,000
TOTAL ILLINOIS				GT	572,900	572,900	470,810	470,810	-	-	-	-	-	-	40,000
INDIANA															
1. na	Public Service Company of Indiana	Miami Wabash # 6 & 7	E	GT	32,500 28	37,000	-	-	-	-	-	-	-	-	-
2. Fort Wayne	Fort Wayne, City of	na	E	GT	-	-	1 000	15,000	-	-	-	-	-	-	-
TOTAL INDIANA				GT	32,500	37,000	15,000	15,000	-	-	-	-	-	-	-
MICHIGAN															
1. Ludington	Consumers Power Company	Ludington	N	H	-	-	-	-	-	-	-	-	955,000	-	-
2. Comstock	"	Morrow R. E.	E	GT	17,500	20,000	-	-	-	-	-	-	-	-	-
3. Mackinaw City	"	Straits #1	N	GT	25,000	30,000	-	-	-	-	-	-	-	-	-
4. na	"	Thetford #1 - 4	N	GT	74,500 29	88,000	3 500 30	88,000	-	-	-	-	-	-	-
5. Port Huron	Detroit Edison Company	Colfax	N	IC	13,750	14,000	-	-	-	-	-	-	-	-	-
6. Commerce Twp.	"	Hancock #5 & 6	E	GT	-	-	76,300 31	95,000	-	-	-	-	-	-	-
7. Monroe	"	Monroe	E	IC	13,750	14,000	-	-	-	-	-	-	-	-	-
8. Monroe	"	Oliver	N	IC	13,750	14,000	-	-	-	-	-	-	-	-	-
9. Springfield	"	Placid	N	IC	13,750	14,000	-	-	-	-	-	-	-	-	-
10. Farmington Twp.	"	Wilmont	N	IC	13,750	14,000	-	-	-	-	-	-	-	-	-
11. Marquette	Upper Peninsula Power Company	Red Jacket	N	IC	10,000	10,000	-	-	-	-	-	-	-	-	-
12. Wyandotte	Wyandotte, Dept. of Mun. Serv.	Wyandotte #6	E	GT	16,320 4	16,320	-	-	-	-	-	-	-	-	-
TOTAL MICHIGAN				GT	133,320	134,320	5 300	183,000	-	-	-	-	-	-	-
				H	-	-	-	-	-	-	-	-	955,000	-	-
				IC	78,750	80,000	-	-	-	-	-	-	-	-	-

Table 6. The Other Plants or Units Planned or Under Construction [illegible]-75: Hydro-Electric, Internal Combustion and Gas Turbine

CITY	COMPANY	PLANT	N-NEW E-EXISTING PLANT	TYPE OF PLANT 1	1969 NAMEPLATE 2	1969 DEPENDABLE 3	1970 NAMEPLATE 2	1970 DEPENDABLE 3	1971 NAMEPLATE 2	1971 DEPENDABLE 3	1972 NAMEPLATE 2	1972 DEPENDABLE 3	1973 CAPACITY 4	1974 CAPACITY 4	1975 CAPACITY 4
EAST NORTH CENTRAL - Cont'd															
OHIO															
1. Cincinnati	Cincinnati Gas & Electric Company	Dicks Crk. #2 - 5	E	GT	72,640 32	95,000									
2. Aberdeen	"	S.H. Stuart	N	IC	-	-	-	-	-	-	-	-	-	-	-
3. Columbus	Columbus & Southern Ohio Electric Co.	Walnut #8	E	GT	32,600 5	36,000	11,000 4	11,000	-	-	-	-	-	-	-
4. Dayton	Dayton Power & Light Company	Yankee Street	N	GT	55,782	69,000	-	-	-	-	-	-	-	-	-
							-	-	-	-	-	-	-	-	-
TOTAL OHIO				GT	161,022	200,000									
				IC	-	-	-	-	-	-	-	-	-	-	-
							11,000	11,000	-	-	-	-	-	-	-
WISCONSIN															
1. Kaukauna	Kaukauna, City of	Kaukauna	N	GT	17,400	18,000									
2. Superior	Lake Superior District Power Company	Flambeau #1	N	GT	20,000 5	20,000	-	-	-	-	-	-	-	-	-
3. Two Creeks	Wisconsin Electric Power Company	Point Beach	N	GT	20,000	20,000	-	-	-	-	-	-	-	-	-
4. Port Washington	"	Port Washington	N	GT	20,000	20,000	-	-	-	-	-	-	-	-	-
5. Green Bay	Wisconsin Public Service Corp.	Weston #31	E	GT	17,900 5	25,000	-	-	-	-	-	-	-	-	-
							-	-	-	-	-	-	-	-	-
TOTAL WISCONSIN				GT	95,300	103,000									
							-	-	-	-	-	-	-	-	-
WEST NORTH CENTRAL															
IOWA															
1. Coralville	Iowa-Illinois Gas & Electric Co.	Coralville #1 - 4	E	GT	-	-									
2. Charles City	Iowa Public Service Company	Charles City	E	GT	33,000	33,900	72 00 33	72,300	-	-	-	-	-	-	-
							-	-	-	-	-	-	-	-	-
TOTAL IOWA				GT	33,000	33,900	72 00	72,300	-	-	-	-	-	-	-
KANSAS															
1. no	Central Kansas Power Company	Colby #3	E	GT	-	-									
2. Kansas City	Kansas City Board of Public Utilities	Quindaro #3	E	GT	16,800	16,810	18 000	18,000	-	-	-	-	-	-	-
3. Wichita	Kansas Gas & Electric Company	Wichita	E	IC	2,500	2,700	-	-	-	-	-	-	-	-	-
							-	-	-	-	-	-	-	-	-
TOTAL KANSAS				GT	16,800	16,810									
				IC	2,500	2,700	18,000	18,000	-	-	-	-	-	-	-
							-	-	-	-	-	-	-	-	-
MINNESOTA															
1. Marshall	Marshall, City of	Marshall	E	GT	19,700 4	19,700									
2. St. Cloud	Northern States Power Company	Granite City #1 - 4	N	GT	69,300	78,600	-	-	-	-	-	-	-	-	-
3. Mankato	"	Key City #1 - 4	N	GT	-	-	-	-	-	-	-	-	-	-	-
							89 00 34	78,600	-	-	-	-	-	-	-
TOTAL MINNESOTA				GT	89,000	98,300	69,.00	78,600	-	-	-	-	-	-	-
MISSOURI															
1. Carthage	Carthage, City of	Carthage #1 & 2	N	IC	-	-	4 00	4,400	4,400	4,400	-	-	-	-	-
2. Independence	Independence, City of	Substation #1 & 2	N	GT	30,000 35	30,000	-	-	-	-	-	-	-	-	-
3. Stockton	Southwestern Power Administration	Stockton #1	N	H	-	-	45,200	45,200	-	-	-	-	-	-	-
TOTAL MISSOURI				GT	30,000	30,000	-	-	-	-	-	-	-	-	-
				H	-	-	45 00	45,200	-	-	-	-	-	-	-
				IC	-	-	4 00	4,400	4,400	4,400	-	-	-	-	-
SOUTH ATLANTIC															
FLORIDA															
1. St. Petersburg	Florida Power Corporation	Higgins	E	GT	67,000 5	67,000	-	-	-	-	-	-	-	-	-
2. Port St. Joe	"	Port St. Joe	N	GT	-	-	17, 00	18,000	-	-	-	-	-	-	-
3. Turner	"	Turner	E	GT	-	-	34,000	36,000	-	-	-	-	-	-	-
4. Lauderdale	Florida Power & Light Company	Lauderdale	E	GT	-	-	440,000 36	440,000	-	-	-	-	-	-	-
5. Gainesville	Gainesville, City of	Gainsville	E	GT	15,000 5	15,000	-	-	-	-	-	-	-	-	-
6. Jacksonville	Jacksonville, City of	Kennedy	E	GT	34,000 5	32,800	-	-	-	-	-	-	-	-	-
7. Jacksonville	"	Southside	E	GT	34,000 5	32,800	-	-	-	-	-	-	-	-	-
8. Lakeland	Lakeland, City of	Lakeland #3	E	IC	5,000	5,000	-	-	-	-	-	-	-	-	-
9. Tallahassee	Tallahassee, City of	West Side #1	N	GT	16,000 4	16,000	-	-	-	-	-	-	-	-	-
10. Tampa	Tampa Electric Company	Big Bend	N	GT	17,500 5	17,500	-	-	-	-	-	-	-	-	-
11. Tampa	"	Cannon F.J.	E	GT	17,500 5	17,500	-	-	-	-	-	-	-	-	-
TOTAL FLORIDA				GT	201,000	198,600	491,000	494,000	-	-	-	-	-	-	-
				IC	5,000	5,000	-	-	-	-	-	-	-	-	-

Table 6. The Other Plants or Units Planned or Under Construction, 1970-75: Hydro-Electric, Internal Combustion and Gas Turbine

CITY	COMPANY	PLANT	N-NEW E-EXISTING PLANT	TYPE OF PLANT 1	1969 NAMEPLATE 2	1969 DEPENDABLE 3	1970 NAMEPLATE 2	1970 DEPENDABLE 3	1971 NAMEPLATE 2	1971 DEPENDABLE 3	1972 NAMEPLATE 2	1972 DEPENDABLE 3	1973 CAPACITY 4	1974 CAPACITY 4	1975 CAPACITY 4
SOUTH ATLANTIC - Cont'd															
GEORGIA															
1. Bibb County	Georgia Power Company	Arkwright 5A & 5B	E	GT	34,000 37	34,000	-	-	-	-	-	-	-	-	-
2. Smyrna	"	Atkinson #1 & 2	E	GT	-	-	80,000 38	80,000	-	-	-	-	-	-	-
3. Savannah	Savannah Electric & Power Company	Port Wentworth	E	GT	19,200	19,200	-	-	-	-	-	-	-	-	-
4. na	Southeastern Power Administration	Carters #1 & 2	N	H	-	-	-	-	-	-	-	-	500,000 39	-	-
5. West Point	"	West Point #1 & 2	N	H	-	-	-	-	-	-	-	-	73,375 40	-	-
TOTAL GEORGIA				GT	53,200	53,200	80,000	80,000	-	-	-	-	-	-	-
				H	-	-	-	-	-	-	-	-	573,375	-	-
MARYLAND															
1. Baltimore	Baltimore Gas & Electric Company	North Cliff	N	GT	133,500 41	133,000	-	-	-	-	-	-	-	-	-
2. Baltimore	"	Richmond	N	GT	-	-	-	-	172,100	206,800	-	-	-	-	-
3. Baltimore	"	Riverside #6	E	GT	-	-	132,000	-	-	-	-	-	-	-	-
4. na	"	Unassigned	N	GT	-	-	117,000	216,000	216,000	-	-	-	-	-	-
5. Baltimore	"	Westport #5	E	GT	121,500 5	132,000	-	-	-	-	-	-	-	-	-
6. Newbury	Potomac Electric Power Company	Morgantown	N	GT	-	-	-	-	34,600	40,000	-	-	-	-	-
TOTAL MARYLAND				GT	255,000	265,000	249,000	422,700	462,800	-	-	-	-	-	-
NORTH CAROLINA															
1. Cape Fear	Carolina Power & Light Company	Cape Fear	E	GT	84,704 42	73,600	-	-	-	-	-	-	-	-	-
2. Sutton	"	Sutton 3 & C	E	GT	65,280 43	65,900	-	-	-	-	-	-	-	-	-
3. Lumberton	"	Weatherspoon	E	GT	-	-	84,000	-	-	-	-	-	-	-	-
4. Draper	Duke Power Company	Dan River 6C	E	GT	29,000	29,000	-	-	-	-	-	-	-	-	-
5. Mount Holly	"	Riverbend 8C-11C	E	GT	144,000 45	144,000	-	-	-	-	-	-	-	-	-
6. na	"	Urquhart #1 & 2	N	GT	46,000 46	46,000	-	-	-	-	-	-	-	-	-
TOTAL NORTH CAROLINA				GT	368,984	358,500	84,000	-	-	-	-	-	-	-	-
SOUTH CAROLINA															
1. Hartsville	Carolina Power & Light Company	H.B. Robinson	E	IC	5,000 47	5,000	-	-	-	-	-	-	-	-	-
2. Near Clemson	Duke Power Company	Keowee #1 & 2	N	H	-	-	156,500 48	-	-	-	-	-	-	-	-
3. Charleston	South Carolina Electric & Gas Co.	Coit #1 & 2	N	GT	40,000 49	43,000	-	-	-	-	-	-	-	-	-
4. Lexington City	"	Saluda	N	H	-	-	70,000	-	-	-	-	-	-	-	-
5. Beech Island	"	Urquhart	E	GT	40,000	40,000	-	-	-	-	-	-	-	-	-
TOTAL SOUTH CAROLINA				GT	80,000	83,000	-	-	-	-	-	-	-	-	-
				H	-	-	226,500	-	-	-	-	-	-	-	-
				IC	5,000	5,000	-	-	-	-	-	-	-	-	-
VIRGINIA															
1. Chesterfield	Virginia Electric & Power Company	Chesterfield	E	GT	41,066 5	47,910	-	-	-	-	-	-	-	-	-
2. Portsmouth	"	Portsmouth	E	GT	143,731	168,000	-	-	-	-	-	-	-	-	-
TOTAL VIRGINIA				GT	184,797	215,910	-	-	-	-	-	-	-	-	-
EAST SOUTH CENTRAL															
ALABAMA															
1. Demopolis	Alabama Power Company	Demopolis #1 & 2	N	GT	50,000 50	50,000	-	-	-	-	-	-	-	-	-
2. Alabama River	Southeastern Power Administration	Millers Ferry	N	H	75,000 51	75,000	50,000 52	50,000	25,000	25,000	-	-	-	-	-
3. Gaston	Southern Electric Generating Co.	Gaston	E	GT	-	-	20,000	-	-	-	-	-	-	-	-
4. na	U.S. Army Corps of Engineers	Jones Bluff #1,2,3,4	N	H	-	-	-	-	-	-	-	-	-	68,000 53	-
TOTAL ALABAMA				GT	50,000	50,000	20,000	-	-	-	-	-	-	-	-
				H	75,000	75,000	50,000	25,000	25,000	-	-	-	-	68,000	-
KENTUCKY															
1. na	Kentucky Utilities Company	Haefling	N	GT	-	-	51,000	-	-	-	-	-	-	-	-
2. Louisville	Louisville Gas & Electric Company	Zorn #1	N	GT	16,000	16,000	-	-	-	-	-	-	-	-	-
3. Owensboro	Owensboro, City of	Laurel	N	H	-	-	-	-	-	-	-	-	-	-	61,000
TOTAL KENTUCKY				GT	16,000	16,000	51,000	-	-	-	-	-	-	-	-
				H	-	-	-	-	-	-	-	-	-	-	61,000

Table 6. The Other Plants or Units Planned or Under Construction, 1969-75: Hydro-Electric, Internal Combustion and Gas Turbine

CITY	COMPANY	PLANT	N-NEW E-EXISTING PLANT	TYPE OF PLANT 1	1969 NAMEPLATE 2	1969 DEPENDABLE 3	1970 NAMEPLATE 2	1970 DEPENDABLE 3	1971 NAMEPLATE 2	1971 DEPENDABLE 3	1972 NAMEPLATE 2	1972 DEPENDABLE 3	1973 CAPACITY 4	1974 CAPACITY 4	1975 CAPACITY 4
EAST SOUTH CENTRAL - Cont'd															
MISSISSIPPI															
1. Watson	Mississippi Power Company	Watson	E	GT	-	-	0,000 4	40,000	-	-	-	-	-	-	-
2. Moselle	South Mississippi Electric Pwr. Assn.	Moselle	N	GT	14,000 4	14,000	-	-	28,000 4	28,000	-	-	-	-	-
3. Benndale	Southwest Mississippi Elec. Pwr. Assn.	Benndale	N	GT	-	-	-	-	17,000	17,000	-	-	-	-	-
TOTAL MISSISSIPPI				GT	14,000	14,000	0,000	40,000	45,000	45,000	-	-	-	-	-
TENNESSEE															
1. na	Tennessee Valley Authority	Cordell Hull 1, 2&3	N	N	-	-	-	-	66,666 56	66,666	33,333	33,333	-	-	-
2. na	"	Priest #1	N	N	28,000 4	28,000	-	-	-	-	-	-	-	-	-
3. Elk River	"	Tims Ford	N	N	-	-	-	-	45,000	40,000	-	-	-	-	-
TOTAL TENNESSEE				N	28,000	28,000	-	-	111,666	106,666	33,333	33,333	-	-	-
WEST SOUTH CENTRAL															
ARKANSAS															
1. na	Southwestern Power Administration	De Gray #1 & 2	N	N	-	-	-	-	68,000 6 55	68,000	-	-	-	-	-
2. na	"	Ozark #1 - 4	N	N	-	-	-	-	-	-	80,000 56	80,000	20,000	-	-
TOTAL ARKANSAS				N	-	-	-	-	68,000	68,000	80,000	80,000	20,000	-	-
LOUISIANA															
1. Thibodaux	Thibodaux, City of	Thibodaux	E	IC	6,250 4	6,250	-	-	-	-	-	-	-	-	-
TOTAL LOUISIANA				IC	6,250	6,250	-	-	-	-	-	-	-	-	-
OKLAHOMA															
1. Near Salina	Grand River Dam Authority	Salina #4, 5 & 6	N	N	-	-	-	-	129,600 6 57	129,600	-	-	-	-	-
2. na	Oklahoma Gas & Electric Company	Seminole #1	N	GT	-	-	-	-	22,000	19,000	-	-	-	-	-
3. na	Southwestern Power Administration	Broken Bow #1 & 2	N	N	-	-	0,000 58	86,000	-	-	-	-	-	-	-
4. na	"	Narrows	N	N	8,500	9,000	-	-	-	-	-	-	-	-	-
5. Locust Grove	"	Robert S. Kerr #1-4	N	N	-	-	55,000 59	55,000	55,000 60	55,000	-	-	-	-	-
6. na	"	Webbers Falls #1-3	N	N	-	-	-	-	-	-	40,000 61	40,000	20,000	-	-
TOTAL OKLAHOMA				GT	-	-	-	-	22,000	19,000	-	-	-	-	-
				N	8,500	9,000	155,000	141,000	184,600	184,600	40,000	40,000	20,000	-	-
TEXAS															
1. Lubbock	Lubbock, City of	Holly Avenue	E	GT	-	-	7,500	17,500	-	-	-	-	-	-	-
2. na	Sabina River Authority	Toledo Bend #1 & 2	N	N	80,000 62	85,000	-	-	-	-	-	-	-	-	-
TOTAL TEXAS				GT	-	-	7,500	17,500	-	-	-	-	-	-	-
				N	80,000	85,000	-	-	-	-	-	-	-	-	-
MOUNTAIN															
ARIZONA															
1. na	Salt River (AIP) Dist. Proj.	Horse Mesa	N	N	-	-	-	-	-	-	93,500	93,500	-	-	-
2. na	"	Mormon Flats	N	N	-	-	3,000	3,000	48,600	48,600	-	-	-	-	-
3. na	"	Roosevelt	N	N	-	-	-	-	-	-	-	-	16,710	-	-
TOTAL ARIZONA				N	-	-	3,000	3,000	48,600	48,600	93,500	93,500	16,710	-	-
COLORADO															
1. Colorado Springs	Colorado Springs Dept. Utilities	Birdsall	E	GT	-	-	-	-	17,000	17,000	-	-	-	-	-
2. Gunnison River	"	Morrow Point #1 & 2	N	N	-	-	120,000 63	120,000	-	-	-	-	-	-	-
TOTAL COLORADO				GT	-	-	-	-	17,000	17,000	-	-	-	-	-
				N	-	-	3,000	120,000	-	-	-	-	-	-	-
UTAH															
1. Ogden	Utah Power & Light Company	na	N	GT	-	-	15,000	15,000	-	-	-	-	-	-	-
TOTAL UTAH				GT	-	-	15,000	15,000	-	-	-	-	-	-	-

Table 6. The Other Plants or Units Planned or Under Construction, 1969-75: Hydro-Electric, Internal Combustion and Gas Turbine

CITY	COMPANY	PLANT	N-NEW E-EXISTING PLANT	TYPE OF PLANT 1	1969 NAMEPLATE 2	1969 DEPENDABLE 3	1970 NAMEPLATE 2	1970 DEPENDABLE 3	1971 NAMEPLATE 2	1971 DEPENDABLE 3	1972 NAMEPLATE 2	1972 DEPENDABLE 3	1973 CAPACITY 4	1974 CAPACITY 4	1975 CAPACITY 4
PACIFIC															
CALIFORNIA															
1. Burbank	Burbank, City of	Magnolia	E	GT	20,000	20,000	20,000	20,000	-	-	30,000	30,000	-	-	-
2. na	Calif. Dept. of Water Resources	Cottonwood	N	N	-	-	-	-	-	-	-	-	14,000	-	-
3. na	"	Devil's Canyon	N	N	-	-	-	-	-	-	117,000	117,000	-	-	-
4. Feather River	"	Oroville #4 - 6	N	N	97,750 5	97,750	-	-	-	-	-	-	-	-	-
5. na	"	Pyramid	N	N	-	-	-	-	-	-	172,000	172,000	-	-	-
6. Los Angeles	Los Angeles Dept. of Wtr. & Pwr.	Castaic	N	N	-	-	-	-	-	-	-	-	200,000	-	-
7. Los Angeles	"	Dry Canyon	N	N	-	-	-	-	-	-	-	-	-	-	-
8. Los Angeles	"	Foot Hill	N	N	-	-	50,000	38,000	-	-	-	-	-	-	-
9. Feather River	Pacific Gas & Electric Company	Belden #1	N	N	117,000 4	117,000	-	-	12,000	12,000	-	-	-	-	-
10. Sacramento	Sacramento Municipal Utility Dist.	Loon Lake	N	N	-	-	-	-	-	-	-	-	-	-	-
11. San Diego	San Diego Gas & Electric Company	Mission	E	GT	162,000	162,000	-	-	75,000	75,000	-	-	-	-	-
12. San Francisco	San Francisco, City & County of	New Moccasin #1 & 2	N	N	102,000 64	102,000	-	-	-	-	-	-	-	-	-
13. na	Sierra Pacific Power Company	Humboldt Valley	N	GT	-	-	-	-	-	-	-	-	-	-	-
14. Lake Tahoe	"	King's Beach	N	IC	16,500	16,500	16,500	15,000	-	-	-	-	-	-	-
15. Long Beach	Southern California Edison Co.	Alamitos #7	E	GT	138,125	121,000	-	-	-	-	-	-	-	-	-
16. Etiwanda	"	Etiwanda #5	E	GT	132,000 5	121,000	-	-	-	-	-	-	-	-	-
17. Hermosa Beach	"	Huntington Beach #5	E	GT	132,000	121,000	-	-	-	-	-	-	-	-	-
18. Oxnard	"	Mandalay #3	E	GT	-	-	-	-	-	-	-	-	-	-	-
19. Long Beach	"	Pinnacles #1	N	GT	12,000	12,000	138,125	121,000	-	-	-	-	-	-	-
20. Don Pedro	Turlock Irrigation District	New Don Pedro #1 - 3	E	N	-	-	-	-	-	-	-	-	-	-	-
21. Dobbins	Yuba County Water Agency	Yuba, New Colgate	N	N	-	-	151,600 65	129,000	-	-	-	-	-	-	-
22. da	"	Yuba, New Narrow	N	N	-	-	282,600	282,600	-	-	-	-	-	-	-
							47,750 4	46,750	-	-	-	-	-	-	-
TOTAL CALIFORNIA				GT	596,125	557,000	179,125	156,000	-	-	30,000	30,000	-	-	-
				N	316,750	318,750	520,950	496,350	87,000	87,000	289,000	289,000	214,000	-	-
				IC	16,500	16,500	-	-	-	-	-	-	-	-	-
OREGON															
1. Columbia River	Bonneville Power Administration	Lower Monumental	N	N	411,000 66	411,000	-	-	-	-	-	-	-	-	-
TOTAL OREGON				N	411,000	411,000	-	-	-	-	-	-	-	-	-
WASHINGTON															
1. na	Bonneville Power Administration	Dworshak	N	N	-	-	-	-	-	-	400,000	400,000	-	-	-
2. Columbia River	"	J. Day #5 - 16	N	N	959,000 67	959,000	411,000 68	411,000	274,000 69	274,000	-	-	-	-	-
3. Snake River	"	Little Goose	N	N	-	-	411,000 70	411,000	-	-	-	-	-	-	-
4. na	"	Puget Sound	N	IC	2,750	2,800	-	-	-	-	-	-	-	-	-
5. Columbia River	"	Dalles #13 - 22	E	N	-	-	-	-	258,000 71	258,000	344,000 72	344,000	86,000	-	-
6. Columbia River	PUD #1 Chelan County	Rocky Reach #8 - 11	N	N	-	-	-	-	600,000 4	600,000	-	-	-	-	-
7. Columbia River	"	Wells #8 - 10	N	N	323,290 5 73	232,290	-	-	-	-	-	-	-	-	-
8. na	U.S. Bureau of Reclamation	Grand Coulee 3, #1-3	N	N	-	-	-	-	-	-	-	-	600,000	1,200,000	-
TOTAL WASHINGTON				N	1,191,290	1,191,390	822,000	822,000	1,132,000	1,132,000	744,000	744,000	686,000	1,200,000	-
				IC	2,750	2,800	-	-	-	-	-	-	-	-	-
	TOTAL UNITED STATES			GT	4,315,125	4,519,518	3,733,185	3,880,410	1,318,400	1,385,800	30,000	30,000	10,000	-	40,000
				N	2,490,540	2,496,040	2,926,150	1,904,050	2,528,366	2,531,866	2,029,833	2,029,833	4,785,085	1,868,000	75,400
				IC	154,000	156,255	15,400	15,400	-	-	-	-	-	-	-

(See next page for footnotes and source.)

Table 6. The Other Plants or Units Planned or Under Construction.

Type of plant: GT-Gas Turbine; H-Hydro-electric; IC-Internal Combustion.
Maximum generator nameplate rating which appears on manufacturer's nameplate.
Dependable capacity of unit is the capacity which has been proven by the operating experience of the user.
Capacity ratings not identified as nameplate or dependable.
Unit(s) placed in commercial operation during first eight months of 1969.
Reversible pumped storage.
Three units at 22,900 kw.
Three units at 250,000 kw.
Three units at 16,750 kw.
Six units at 16,750 kw.
Three units at 18,600 kw. Two units placed in commercial operation during first eight months of 1969.
Three units at 40,500 kw.
Two units at 113,200 kw.
Eight units at 18,000 kw.
Two units at 13,000 kw.
Three units in all. Two units at 175,000 kw; both are reversible pumped storage. One unit at 50,000 kw, conventional pumped storage.
Two units at 18,600 kw.
Two units at 18,600 kw.
Three units at 18,600 kw. Two units placed in commercial operation during first eight months of 1969.
Three units at 18,600 kw.
Twelve units at 18,333 kw.
Four units at 19,000 kw.
Eight units at 18,375 kw.
Six units at 22,150 kw.
Four units at 18,250 kw.
Four units at 19,000 kw.
Four units at 18,150 kw.
Two units at 16,250 kw.
Two units at 37,250 kw.
Two units at 37,250 kw.
Two units at 39,400 kw.
Two units at 19,000 kw. Two units at 17,330 kw.
Four units at 18,075 kw.
Four units at 17,323 kw.
Two units at 15,000 kw.
Two units at 220,000 kw.
Two units at 17,000 kw.
Two units at 40,000 kw.
Two units at 250,000 kw.
Two units at 24,700 kw.

75: Hydro-Electric, Internal Combustion and Gas Turbine

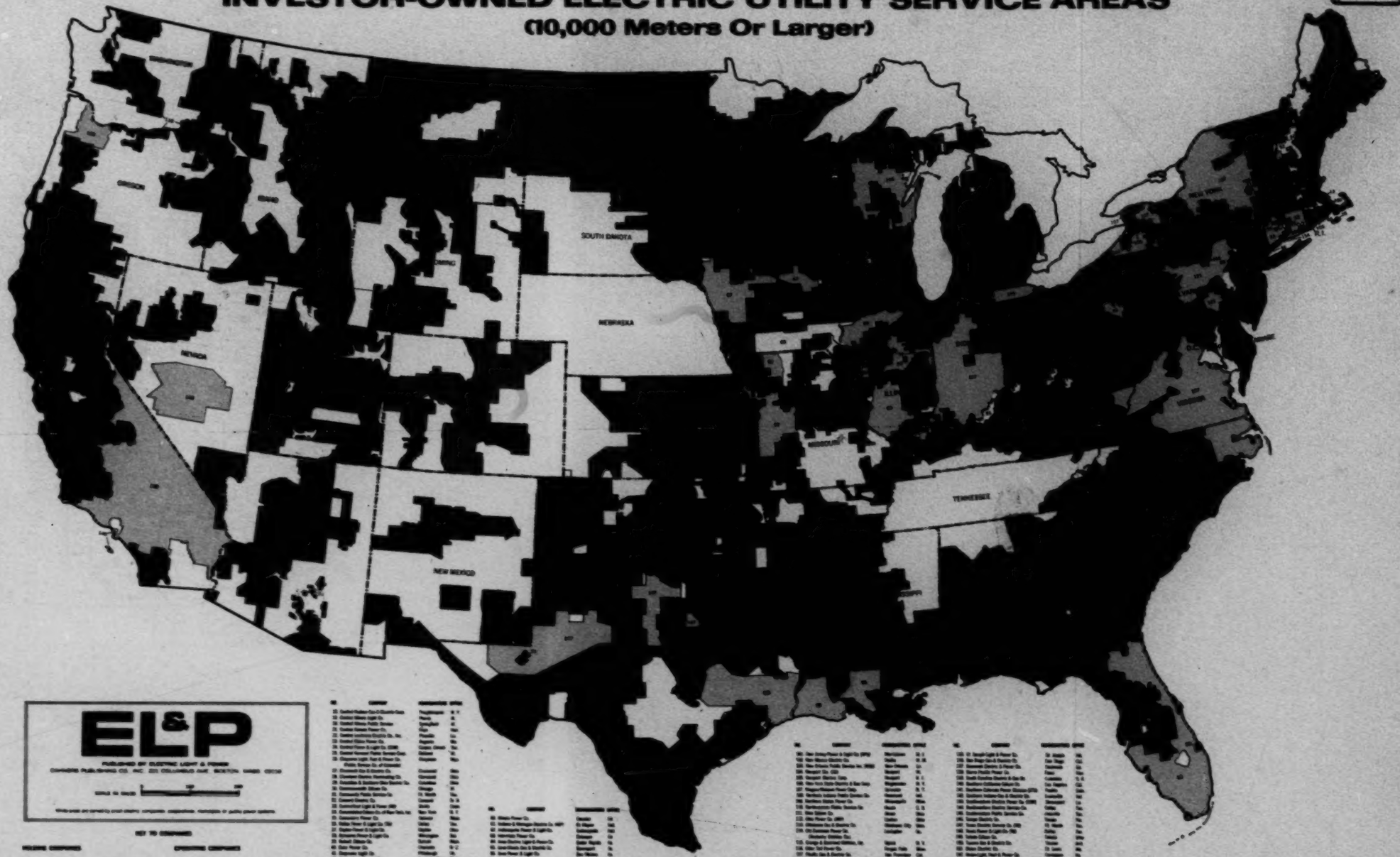
Eight units at 16,690 hp.
Four units at 21,100 hp.
Two units at 32,640 hp.
Two units at 39,750 hp.
Four units at 36,000 hp.
One unit at 29,000 hp. One unit at 17,000 hp.
Two units at 2,500 hp.
Two units at 70,000 hp.
Two units at 20,000 hp.
Two units at 25,000 hp.
Three units at 25,000 hp.
Two units at 25,000 hp.
Four units at 17,000 hp.
Two units at 33,333 hp.
One unit at 28,000 hp, reversible pumped storage. One unit at 40,000 hp, conventional pumped storage.
Four units at 30,000 hp.
Three units at 43,200 hp.
Two units at 30,000 hp.
Two units at 27,500 hp.
Two units at 27,500 hp.
Two units at 20,000 hp.
Two units at 40,000 hp.
Two units at 60,000 hp.
Two units at 31,000 hp. One unit placed in commercial operation during first eight months of 1969.
Three units at 47,200 hp.
Three units at 137,000 hp.
Seven units at 137,000 hp. Three units placed in commercial operation during first eight months of 1969.
Three units at 137,000 hp.
Two units at 137,000 hp.
Three units at 411,000 hp.
Three units at 258,000 hp.
Four units at 86,000 hp.
Three units at 77,430 hp.

Source: Federal Power Commission Report 121 (data available as of Aug. 31, 1969); The Edison Electric Institute and news releases.

XXX

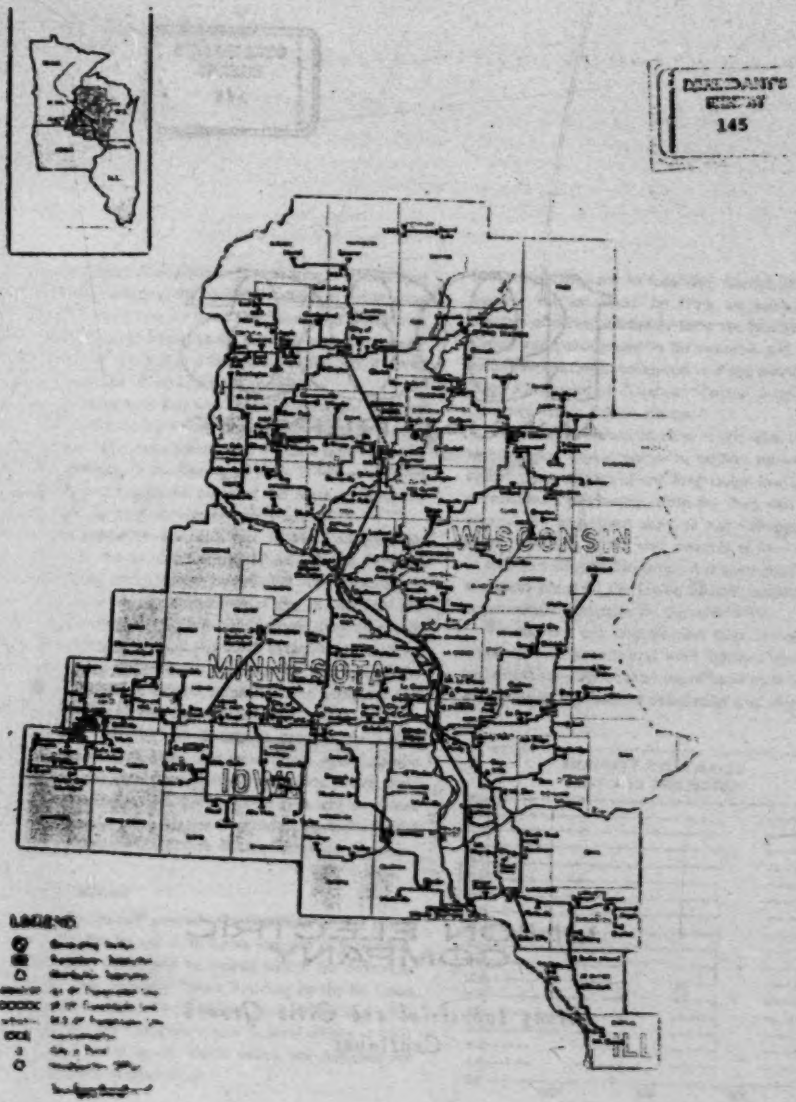
INVESTOR-OWNED ELECTRIC UTILITY SERVICE AREAS

(10,000 Meters Or Larger)



EL&P

PUBLISHED BY ELECTRIC LIGHT & POWER


145
WISCONSIN
MINNESOTA
IOWA
ILL.
LEGEND

SWEDISH
INDEX
146

1966 ANNUAL REPORT

UNION ELECTRIC COMPANY

Strong Industrial and Civic Growth Continues

• • •

cost of over $14 million. It will join a similar line between Minneapolis and Hills which is being completed this Spring by Iowa and Minnesota companies. This St. Louis-Minneapolis line will permit the interchange of as much as a half million kilowatts of power between the several utilities involved.

Construction also was started during the year on the Company's portion of a 345,000 volt St. Louis-Kansas City transmission line, which is expected to be in operation in the Spring of 1968. It will strengthen the power supply for much of the State of Missouri, as well as the States immediately west of us.

Transmission ties with our Ill-Mo Pool partners (Illinois Power and Central Illinois Public Service) are being strengthened by 345,000 volt interconnections and the other members of the Ill-Mo Pool are coordinating their extra-high-voltage programs with companies to the east and north to facilitate the transmission of large blocks of power in and out of the Pool. Improved system reliability and economy will result through this coordinated program.

Also, 345,000 volt lines will provide the major transmission between the new Sioux and Labadie Plants and bulk transmission substations. When these lines are completed, the St. Louis area will be almost encircled by extra-high-voltage lines to provide for the most economical delivery of large amounts of power.

New Offices

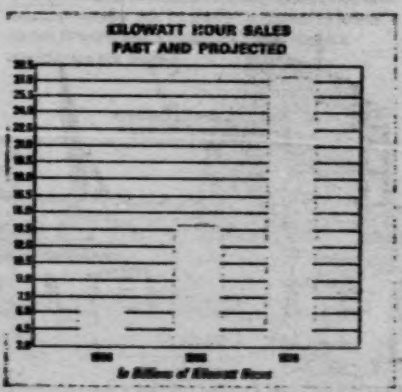
The Company's general office building at 315 North Twelfth Boulevard in St. Louis was sold in June 1966. Executive offices will be moved within the next year to the new Gateway Tower Building on the St. Louis riverfront. Other departments were moved early this year into the Company's new general offices at 1901 Gratiot Street in St. Louis which are designed for more efficient operations.

The Emphasis on Research and Improved Efficiency

Union Electric has participated in nuclear power research as long ago as 1951 when we joined with Monsanto Company in feasibility studies of a multi-purpose reactor plant. In 1953, we joined with a number of other utilities to form the Nuclear Power Group and participated in the research and development culminating in construction of the initial 200,000 kilowatt Dresden Nuclear Power unit on the Commonwealth Edison system.

We have continued in close touch with the rapid technological developments in nuclear power during recent years as part of our long range studies of the economics of producing electricity from this form of energy. An important asset to our Company is its close proximity to the vast reserves of low-cost coal in southern Illinois. However, it is quite possible that a nuclear plant on the Union Electric system will be economically attractive by the mid-1970's.

Throughout our organization there is continuing emphasis on research and work improvements. Our activities range from better use of hand tools to highly sophisticated methods of calculating and dispatching



Top, right: Queeny Tower, newest addition to the Barnes Hospital group.

Bottom, right: Christmas lights at Northwest Plaza in St. Louis County, the largest shopping center in the Midwest.

* * *

DX 147

Union Electric Company - 1967 Annual Report

* * *

A 345,000 volt interconnection with MAIN was completed in mid-1967. This high voltage tie links us directly with MAIN through our Ill-Mo Pool partners to the east. The MAIN network covers 10 states, embracing much of the Midwest and extending as far east as Virginia.

As part of our membership in MAPP, we also completed our portion of a 345,000 volt line extending from St. Louis to the Minneapolis-St. Paul area. The 250-mile Union Electric portion was constructed at a cost of $14 million, and the interconnection permits the exchange of up to 500,000 kilowatts of power. MAPP includes utilities in the states immediately west of MAIN and extends north into Canada.

Construction continued on a 345,000 volt St. Louis-Kansas City line which is scheduled for completion in 1968. This will strengthen the power supply for much of Missouri, as well as the states immediately west of us.

Union Electric's Beautification Program

The Company is engaged in a long-range beautification program to improve the appearance of its transmission and distribution lines, substations and transformers.

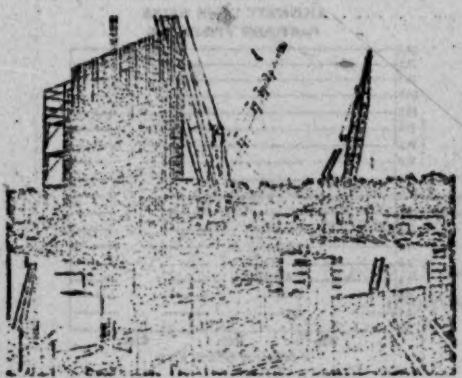
Residential underground distribution is desirable and practical in new subdivisions where the additional cost can be justified. On a system-wide basis, however, the cost of placing all lines underground would be prohibitive. It is estimated that the average residential customer's bill would have to be more than three times the present amount in order to finance the removal of all overhead lines and their relocation underground.

Our program includes the use of low profile substation equipment where possible, gray colored poles and transformers to minimize contrast, the elimination of cross arms, better looking hardware, and so on. We also make extensive use of camouflage with trees and landscaping.

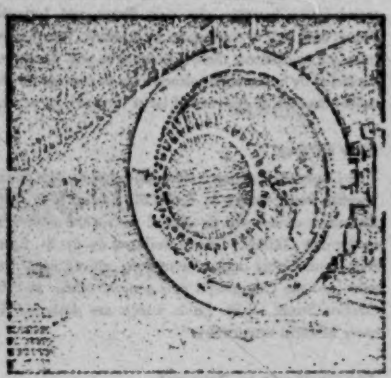
We believe there has been a considerable improvement in the appearance of our overhead facilities, and the effort is a continuing one.

Nuclear Power

As reported to stockholders in the past, the Company's proximity to vast reserves of low cost coal ideally suited for steam plant generation has heretofore given coal-fired plants an economic advantage on our system. However, we keep well informed of the rapid technological developments in nuclear power, and a nuclear plant on the Union Electric System may be economically attractive within the coming decade. In 1967 we retained the NUS Corporation of Washington, D. C., an engineering consulting organization, to assist us in evaluating nuclear plant sites in the Company's service area.



Pedestal center wall for Labadie's No. 1 turbine generator.



Labadie Plant's generator, being built in East Pittsburgh, Pa.

* * *

* * *

The challenge/expansion

north, east, and west through extra-high-voltage lines.

Union Electric is a member of two of the nation's largest power planning groups—MAIN (Mid-America Interpool Network), operating in the Midwest and extending east into Virginia, and MAPP (Mid-Continent Area Power Planners), operating in the states west of MAIN and extending north into Canada.

The plans of both groups are being implemented very effectively. For example, when the huge MAPP system was formed five years ago, its member utilities planned 5,400 miles of EHV lines to be completed by 1980. As of year end 1968, more than 2,500 miles were completed and the network is now expected to be nearly complete by 1972. MAPP members already are planning to build another 5,000 miles by 1980 to create an over-all, interconnected extra-high-voltage grid of 10,400 miles.

Research and Development

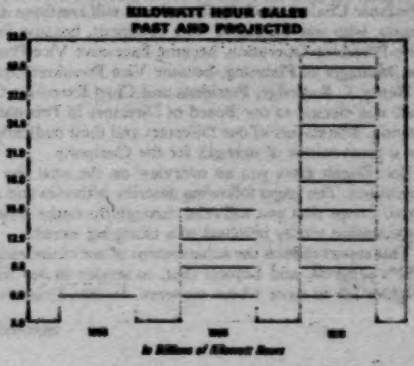
Research and development programs at Union Electric— the constant probing for new devices, new methods—are basic to providing reliable electric service to our customers at lower cost and to improving the Company's contributions to the community in environmental control.

A highlight of the year was the $1 million installation at the Company's Meramec Plant of the nation's first full-scale system for the removal of sulfur dioxide from the stack emission of a coal-fired steam generator—a research effort that will produce significant progress in air pollution abatement technology. At year end, after a three-month "break-in" period, the installation was removed from service for design modifications. It is now back in service with improved performance. This system, which was designed and installed by Combustion Engineering, Inc. was named one of the "engineering achievements of 1968" by the National Society of Professional Engineers.

In a related project, Union Electric engineers have been working to improve sulfur dioxide air monitoring equipment at eight stations which the Company has placed in service around the Sioux and Labadie plants. Data from these stations, along with data from stations operated by governmental authorities, will form an air quality measuring network for the St. Louis area.

As another aspect of environmental control, the Company is engaged in a long-range program to improve the appearance of its poles, lines, substations and transformers.

Union Electric also participates in numerous cooperative research programs with its manufacturing suppliers and with industry groups. One of the most interesting at present is the work of Gulf General Atomic, Inc. on the gas-cooled fast breeder nuclear plant concept, a project in which Union Electric and a number of other electric companies are partners.



* * *

DX 149

Northern States Power Company - 1968 Annual Report

* * *

Although it was unfortunate that the Pathfinder nuclear reactor had to be prematurely retired at some considerable loss to the Company, the experience and know-how of our engineering and operating staff in the field of nuclear power has been extremely beneficial to us in connection with our major new nuclear projects. We feel also that the presence of nuclear power as a competitor has assisted us materially in controlling the costs of fossil fuels.

While managing our day-to-day operations and performing our jobs, we at NSP hold a vision of the future that inspires and challenges us. We see tremendous opportunities in the areas of climate control, transportation, improvement in the environment and living conditions. Imagine domed downtown areas and shopping complexes where the climate is electrically controlled the year around. Home computers will program and direct meal preparation. This is the high-energy society of tomorrow in which electric energy will bring us to new levels of comfort and achievement.

Projections show that all this will mean large increases in business for NSP. Our forecasts indicate that sales of electricity for the year 1972 will total more than 16 billion kilowatt-hours, compared with 12.5 billion kilowatt-hours in 1968. Projecting further, we anticipate that our total Company maximum demand for electricity will rise to more than 13 million kilowatts by 1990, compared with 2.7 million kilowatts in 1968.

As we move into this high-energy era, we are doing everything possible to build and operate our electric facilities so that they will make a minimum impact on the environment. NSP is in the forefront of air pollution control and abatement and will utilize emerging technology to further improve air quality. We are using the most modern design and equipment available to maintain water quality at our generating plants and are conducting continuing studies to assure that nature's balance is maintained. We are drawing on years of research by the Atomic Energy Commission and on the experience of NSP and other utilities to make certain that nuclear power plants present no danger to health and welfare.

In November, NSP and Minnesota Power & Light Company jointly announced the termination of negotiations concerning a possible corporate affiliation between the two companies. As discussions developed, it became clear that this was not a propitious time for an affiliation.

Among your management's most important responsibilities are the development of talent in the organization and constant evaluation of our personnel structure to meet NSP's changing and expanding needs. The broadening scope of our business brought management changes in May, 1968. Allen S. King, who had been Chairman of the Board since his retirement from active service in 1965, was elected Chairman Emeritus. I became Chairman of the Board and will continue as Chief Executive Officer. R. H. Engels, who was Executive Vice President, became President. E. A. Willson, formerly Vice President-Operation, became Executive Vice President, and D. W. Angland, who was Manager of Planning, became Vice President-Operation.

Henry T. Rutledge, President and Chief Executive Officer of Northwest Bancorporation, was elected to our Board of Directors in February, 1968, succeeding Kenneth N. Dayton. The stature of our Directors and their dedication to NSP's corporate citizenship are a great source of strength for the Company.

Bob Engels gives you an overview on the next few pages of the results of our 1968 operations. The pages following describe activities and accomplishments in more specific areas. I hope that you will read through the entire report, because it tells the story of an organization vitally involved in a changing world.

This report reflects the achievement of our entire employee force. We are dedicated to NSP's progress, and beyond that, to service to our fellow man. Our job is to bring a brighter life to those whom we serve. In that I sincerely believe we are succeeding.

March 7, 19

Sincerely,

Earl Ewald

* * *

Record demands by NSP's customers in 1968 called for an all-out effort by the Company's operating and construction forces. A winter maximum demand in power use was set at 2,319,782 kilowatts in January. But this winter record was easily broken early in the summer and four successively higher maximum demands were set as the summer wore on. Finally, the year's record was set August 23 at 2,701,359 kilowatts, a 16.3 per cent increase over the 1967 maximum demand of 2,323,383 kilowatts. At the time of the summer maximum demand, NSP was purchasing 196,000 kilowatts of capacity.

Good planning met needs

NSP had anticipated that kind of demand when planning was started more than four years before on the 580,000-kilowatt Allen S. King generating plant. The King plant

Feeding a thriving, power-hungry area

went into service well ahead of the 1968 summer demand, taking on its shoulders about 20 per cent of the Company's maximum demand. Smaller generating plants, recently built especially to help carry the load in peak times, also did their share in assuring NSP's traditionally dependable power. A 5500-kilowatt diesel generating plant at Albany, Minnesota was ready for winter peak duty in the fall. The Company started building a 69,000-kilowatt gas-turbine electric generating plant for peaking purposes at St. Cloud, Minnesota in 1968 which will be ready for service in May, 1969. A similar installation will be started in 1969 at Mankato, Minnesota to be completed by the spring of 1970.

The Company also announced plans to build a large generating plant on the Minnesota river near Jordan, Minnesota—not far from the Twin Cities—sometime in the late 1970's. The Company has been taking steps toward acquisition of a 2100-acre site in the area. No decision has been made yet on the size of the plant or choice of fuel.

'68 water power well above average

E. A. WILLSON
Executive Vice President

It was a good year for NSP's hydro-electric operations too, cutting NSP's power production expense. The Company's hydro plants turned out 7 per cent of the total energy generated by NSP during the year. This kilowatt-hour production was 25 per cent higher than our 20-year average annual hydro output.

Pathfinder to be converted to gas fuel

The Company made the decision in 1968 to convert the Pathfinder plant near Sioux Falls, South Dakota from nuclear fuel to gas fuel. The gas-fired boilers are now being installed at the plant so that the Pathfinder facility will be ready to generate 70,000 kilowatts of power by summer, 1969.

The Pathfinder nuclear plant had been shut down since September, 1967 because of mechanical problems associated with the reactor. Repairs and modifications necessary to resume nuclear operations would have cost as much as constructing the new gas-fired boilers and could not have been completed by the time power was needed from the plant in 1969.

As a result of the decision to terminate the nuclear portion of the Pathfinder plant, $9.5 million will be written off over a 10-year period. Contractual and technical aspects of the Pathfinder nuclear project are being reviewed by NSP with the contractor, Allis-Chalmers Manufacturing Company, and regulatory aspects of the plant are being reviewed by the Atomic Energy Commission.

Nuclear generating plant construction on schedule

Construction continued on schedule at NSP's 545,000-kilowatt nuclear generating plant at Monticello, Minnesota due for service in 1970. Public hearings were held in May by the Atomic Energy Commission on NSP's Prairie Island plant near Red Wing, Minnesota. Then, when the AEC granted its approval for that 1,100,000-kilowatt plant in July, construction activity picked up immediately. Completion of the first 550,000-kilowatt unit at Prairie Island is set for 1972 . . . the second for 1974.

Transmission lines will deliver power where needed

Many high-voltage transmission lines to speed power today and tomorrow to where it is

● Construction is on schedule at NSP's Prairie Island nuclear generating plant, where these workmen are installing a seal-lining cable for the construction derrick. The 200-foot-high cement "silo" will house the nuclear reactor for the first 560,000-kilowatt generating unit.

* * *

1107

DEFENDANT'S
EXHIBIT
150

NATIONAL POWER SURVEY

A REPORT BY

THE FEDERAL POWER COMMISSION

1964

U.S. Government Printing Office
Washington : October 1964

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C., 20402 - Price $2.00 (Paper cover)

CHAPTER 3

FUELS AND FUEL TRANSPORT FOR ELECTRIC ENERGY

The electric power industry uses more than half of all the bituminous coal mined in this country, large volumes of natural gas and oil, and a growing amount of nuclear energy.

Fossil fuels were the basic energy source of 81 percent of the electricity generated in the United States in 1963. In order to meet the tremendous growth in the demand for electricity expected for the coming decades, our projections indicate that by 1980 the electric power industry will more than triple its 1960 demand for fossil and nuclear fuels and will be using annually some 500 million tons of coal, 4 trillion cubic feet of natural gas, 100 million barrels of residual oil, and 20 to 30 thousand tons of uranium for nuclear generation.

Fuel accounts for 15 cents of every dollar spent by utilities for electric power, with transportation comprising a significant part of the total fuel cost. The future demands for fossil and nuclear fuels involve such large quantities that competition and technological gains will most certainly result in reducing the cost of fuel at the source, and also the cost of moving it to market. Delivered fuel costs are expected to drop from a 1962 average national price of 26 cents per million British thermal units to 21 cents by 1980. These figures reflect anticipated reductions in fuel transportation costs and in some cases, the alternative of locating power plants at the fuel source and transmitting the electricity, rather than the fuel, to the load area.

This chapter reviews the major considerations affecting the supply and costs of fuels to electric utilities during the survey period. In making our appraisal of fuel supply and costs, we have drawn heavily on basic general energy studies conducted in recent years by Government and private sources and especially upon the reports submitted to the Commission by the Special Technical Advisory Committee on Fuels.

Total Fuel Requirements

The total use of fossil and nuclear fuel for electric power generation is projected to increase from 6,500 trillion Btu in 1960 to approximately 22,000 trillion Btu in 1980. The latter figure is equivalent to 900 million tons of coal with a heat content of 12,500 Btu per pound. The rate of increase of use for fuels projected by the electric power industry closely parallels the rate of growth we have projected in the National Power Survey; for 1980 both the loads and the fuel requirements are approximately 3½ times the 1960 level. Although the share of thermal sources (including nuclear) is expected to increase to 87 percent of total kilowatthours generated in 1980 as the share of hydroelectric power declines, continued progress in reducing fuel requirements per kilowatt-hour should offset the impact of the increased reliance on thermal sources.

The estimated total fuel requirements for thermal power generation, including nuclear fuel, by study areas is presented in table 20. These estimates reflect the reduced fuel requirements per kilowatthour of using the larger generating units with improved thermal efficiencies. The trend in fuel used in the typical area tends to follow the expected growth in the area's electrical loads. The major departures from this pattern occur in several areas of the Far West—L, N, O and especially P. These areas at present depend on hydroelectric sources for a major share of their generation but will become increasingly dependent on thermal sources for future growth as the availability of good undeveloped hydro sites diminishes. Some areas, of course, are expected to be moderate net importers or exporters of electricity generated at particularly favorable locations, including some mine-mouth alternatives and Canadian hydro. These sources are examined in chapter 15. The expected growth of fuel requirements therefore does not always coincide with the expected growth in load.

Fuel Availability and Use Trends

The overall outlook for fuel availability is favorable. We expect fuel supplies at prices close to present levels to be ample to meet the thermal electric demand for the life of generating plants installed by 1980.

TABLE 20

Fuel Requirements for Thermal Power Generation by Coordination Study Areas (See Fig. 19)

(Trillions of Btu)[1]

	Coordination study area[2]	1960 actual	1970 estimated	Percent increase 1960-70	1980 estimated	Percent increase 1970-80	Percent increase 1960-80
A	New England	286	530	85.3	900	69.8	214.7
B	New York	444	842	89.6	1,408	67.2	217.1
C	Pennsylvania-New Jersey-Maryland	658	1,057	60.6	1,716	62.3	160.8
D	Ohio Valley	1,156	2,124	83.7	3,489	64.3	201.8
E	Carolinas-Virginia	296	630	112.8	1,246	97.8	320.9
F	Tennessee Valley	469	837	78.5	1,390	66.1	196.4
G	Southeastern	447	1,019	128.0	1,931	89.5	332.0
H	Lower Michigan	252	498	97.6	908	82.3	260.3
I	North Central	872	1,526	75.0	2,608	70.9	199.1
J	Texas Area	348	772	121.8	1,219	57.9	250.3
K	Middle South Area	478	794	66.1	1,246	56.9	160.7
L	Upper Missouri Basin	66	106	60.6	234	120.8	254.5
M	New Mexico and Panhandle	86	158	83.7	252	59.5	193.0
N	Southwest	577	1,093	89.4	2,270	107.7	293.4
O	Colorado-Wyoming Area	71	127	78.9	248	95.3	249.3
P	Northwest	34	50	47.1	442	1,184.0	1,788.2
	Contiguous United States	6,540	12,163	86.0	21,707	78.5	231.9

[1] Includes nuclear as well as conventional thermal plants. Btu requirements for nuclear generation are estimated on the basis of the average heat rate for conventional steam.

[2] Excludes Alaska and Hawaii.

Source: Advisory Committee Report No. 21, prepared by the Fuels Special Technical Advisory Committee, Appendix 1, p. 315, Part II.

Table 21 compares the kilowatt-hours generated from each of the major energy sources in 1963 with estimates for 1980. The actual 1980 figures, and the market shares they imply will, of course, depend on the many hard-to-predict factors which affect interfuel competition. Whatever the precise shares turn out to be, it is clear that each of the fossil fuels will continue to supply both increasing amounts and an important share of a growing market, even though, as the table indicates, the percentage shares of the fossil fuels are expected to decline as a result of important nuclear fuel competition.

Coal, which presently supplies more than half of the market, will continue to be the workhorse for electric generation throughout the survey period, although its percentage share will decline from 54 percent to 47 percent, while natural gas should remain dominant in areas near sources of gas supply, although it can expect increasingly stiff competition elsewhere and on a nationwide basis its share will also decline from the 21 percent of 1963 to 17 percent of 1980. Oil will, in all likelihood, remain confined to coastal areas having access to cheap water transportation, where its share will depend to a large extent on the availability of imports at competitive prices. Overall, it is expected that oil, while more than doubling its volume, will decline on a proportionate basis by a third, from 6 percent to 4 percent of the market. Nuclear fuel will skyrocket from negligible current use to about 19 percent of the 1980 market.

Interfuel Competition

The choice between competing fuels depends not only on delivered prices but on many other factors

TABLE 21

Energy Sources for Generation

	1963		1980	
	Billion kwh	Percent of total	Billion kwh	Percent of total
Coal	494	54	1,264	47
Natural gas	201	21	458	17
Oil	50	6	107	4
Total fossil fuel	745	81	1,829	68
Nuclear	3	0.1	514	19
	748	81	2,343	87
Water power	166	19	340	13
Total	914	100	2,683	100

as well, including the relative thermal efficiencies of different fuels and differences in capital costs of generating plants equipped to burn particular fuels. The following statement by the Fuels Committee sums up some additional considerations:

> In determining the type of fuel to be used for electric generation, there are a number of factors to be reviewed and evaluated. Each of these has a bearing on cost and influences the degree to which an electric utility is able to meet its obligation to provide reliable service at a reasonable price. The costs of storing, handling, and in some instances, disposing of the fuel product are economic factors which can make a low-cost fuel the most expensive fuel. In locations where land costs are high and areas heavily congested, these costs become a major consideration in selecting a proper fuel. In some areas, operating conditions, such as air control regulations on the West Coast, may justify a premium fuel. Therefore, while a general picture can be drawn concerning the availability and price of fuels, the final determination in selecting a fuel or fuels for a particular plant must be based on the specific facts pertinent to that plant and its location.[1]

Relative delivered price per Btu is usually the overriding factor in competition among the fossil fuels. The choice of fuel is an integral part of the selection of a plant site but often competition between fuels may occur after a plant is in operation. Many stations are initially designed and equipped to burn alternative fuels interchangeably upon short notice, and stations originally designed for coal can usually be adapted to use gas or oil. Likewise, some gas or oil-burning plants can be adapted to use coal, but unless the plant was originally designed with this in mind, the conversion may be expensive. In many locations the competing positions of alternative fuels are very close, and a price reduction for any one fuel may trigger competitive reductions in other fuel prices.

While the fuel with the lowest delivered cost usually sets the pace for competition, the delivered prices at which fuels become competitive are not always identical. For instance, a coal-burning plant typically requires 10 to 15 percent more capital investment—chiefly in coal and ash handling equipment and more expensive boiler design—than a comparable plant which is not so equipped. However, this differential has a significant effect on interfuel competition only where gas and oil supplies are adequate to serve the plant's entire fuel requirements throughout its service life. Thermal efficiencies, which vary between different grades of the same fuel as well as between different fuels, also affect the relative prices at which fuels are competitive. Coal typically requires some 3 to 5 percent fewer British thermal units per kilowatt-hour than gas, with oil occupying an intermediate position.

[1] Advisory Committee Report No. 21, p. 317 of Part II.

Interfuel competition is expected to intensify in the future, particularly in the higher fuel cost areas, where improvements in energy transportation and the reductions in the costs of nuclear power should bring fuel costs closer to those of the lower fuel cost areas. Just as nuclear technology is shooting at a continually moving target in attempting to overtake conventional steam-electric generation, nuclear technology in turn is expected to set a continually lowering cost target which the fossil fuels and their modes of transport will be forced to meet.

Coal

Widely varying assessments of coal supplies are available depending upon the purpose and the nature of the investigations. The most recent official Department of the Interior estimate for all types of coal is that "recoverable reserves" in the continental United States, excluding Alaska, amount to 830 billion tons.[3] By comparison the projected energy requirements for thermal electric generation for the year 1980 is equivalent to 900 million tons of coal, of which nearly 500 million tons are expected to be in the form of coal.

The estimates of coal reserves can be misleading. While total reserves are more than adequate to meet any foreseeable demands by the electric utility industry, extensive tracts of coal lands adapted to low-cost mining techniques are by no means unlimited. A better inventory of our low-cost coal reserves than is now available would be of great value in industry planning.

The wide distribution of coal reserves throughout the United States is shown in figure 27 which depicts the "recoverable reserves." It is not generally realized that more coal lies west of the Mississippi River than to the east, although some 60 percent of the higher bituminous grades are found east of the Mississippi. While the western coals can be mined at low cost, they have not been extensively exploited to date, because of their distance from major load centers. Later chapters in the National Power Survey explore the possibilities of utilizing the abundant low-grade coals in the west.

Coal costs and prices at the source vary greatly with geologic conditions, methods of mining, required degree of quality control and many other factors. In order to determine the at-source coal

FIGURE 26 *A twin boom continuous mining machine moves between working places in a West Virginia coal mine. These massive and costly machines typify the bituminous coal industry's drive to hold or reduce the price of coal in the face of rising costs. This machine rips coal from the face of the seam and passes it back to the conveyor belt or shuttle cars at a rate of up to 8 tons a minute, eliminating the separate operations of cutting, drilling, blasting and loading.*

prices for large volume utility coal customers, the Fuels Advisory Committee enlisted the cooperation of 20 selected electric systems which purchased over 45 percent of all coal used by electric utilities in 1961. The average price f.o.b. the mine paid by these systems ranged from 12½ cents to 16½ cents per million Btu and averaged 15 cents per million Btu. 1961 prices in the several coal-producing districts are shown in the Advisory Committee's report.[4]

Coal-mining productivity has more than doubled in the past decade from an average of 7.5 tons per man-day in 1952 to 15.4 tons per man-day in 1962, an almost unprecedented productivity improvement for a mature industry. This represents an accelerated rate of improvement over prior years which, if continued, augurs well for the future competitive position of the coal industry. Continued mine mechanization including the use of large shovels such as the one shown in figure 28, more intensive mining machine utilization, improved haulage systems and the development of mines designed specifically to supply the electric power market are factors operating to lower future coal costs at the mine. Mining conditions, changes in wage rates and the costs of competitive fuels can also alter future prices at the mine.

[3] Advisory Committee Report No. 21, p. 319 of Part II.

[4] Advisory Committee Report No. 21, p. 351 of Part II.

DISTRIBUTION OF FOSSIL FUEL RESERVES

FIGURE 27

FIGURE 28 *Huge machines, such as this electric powered 115 cubic yard strip shovel, operated by the Peabody Coal Company in its strip mines near Paradise, Kentucky, are contributing to the continued reduction in the cost of mining coal.*

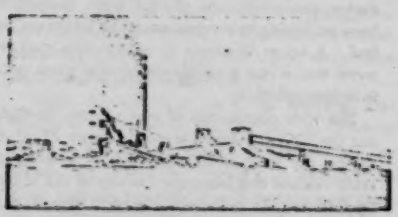


FIGURE 29 *Coal storage yards at coal-burning steam-electric plants contain 4 to 6 months reserve supply of fuel. The stockpile is placed in layers and compacted to prevent spontaneous combustion. The storage yard is equipped with an extensive system of conveyor belts for unloading, stocking and delivering coal to bunkers.*

In general, the outlook is for stable to moderate reductions in the f.o.b. mine prices with further lowering in delivered costs through broad application of volume movements by highly efficient rail and other transport facilities.

Natural Gas

Proven recoverable reserves of natural gas in continental United States, excluding Alaska, approximated 276 trillion cubic feet at the beginning of 1964, equivalent to about 11 billion tons of high

grade bituminous coal and enough to last about 19 years based on 1963 net production of 14.7 trillion cubic feet. The proven reserve figure, however, is a conservative estimate of the reserves already discovered which can be appraised with a high degree of accuracy, and which are recoverable under current economic and operating conditions. There is no comparable estimate of coal reserves.

Estimates of the additional gas that may ultimately be discovered and produced range from 2 to 10 times the 1964 proven reserves of 276 trillion cubic feet. In addition, we are already importing gas from Canada which has 36.7 trillion cubic feet of proven reserves and there is an immense potential for the discovery of additional gas reserves in that country. Alaska, where exploration has just begun, already has an additional 1.7 trillion cubic feet of proven reserves.

Natural gas reserves are heavily concentrated in five States—Texas, Louisiana, Oklahoma, Kansas, and New Mexico (see fig. 27). This contiguous area accounts for over 88 percent of proven reserves in the continental United States excluding Alaska. While the Geological Survey estimates that most of the United States is favorable for the discovery of natural gas and oil reserves, it is expected that the major portion of new reserves to be found and developed between now and 1980 will be in or near the areas in which reserves have already been found.

Electric utility consumption of natural gas has increased at an average annual rate of 11½ percent during the past three decades. This extraordinary growth reflects the dynamic growth of the natural gas industry, especially since World War II as the extension of natural gas pipelines from the major gas producing areas to every State in the Union other than Maine and Vermont has made natural gas available in many new markets throughout the country. Electric utility purchases, frequently under contracts which provided that service could be interrupted when the pipeline required the gas to serve other customers, contributed to the economic feasibility of pipelines by providing markets in the summer and other periods when residential gas demand is not at its highest and by helping justify the installation of larger and more economical pipelines than would otherwise be needed in advance of growth in residential demand.

During the most recent decade, 1953–63, natural gas consumption for electric generation has increased at an annual rate of approximately 7.5 percent, with the share of total thermal generation supplied by natural gas increasing from 24 to 27 percent during the same period. Large scale extensions of pipelines to new areas continued to be important during the past decade as, for example, in California, where electric utility consumption of natural gas, the local supply being augmented by new pipelines from the Permian and San Juan Basins of Texas and New Mexico, more than tripled. New pipelines were also a factor in the West Central Region (FPC Region VI), the second most important growth area. Another significant factor influencing gas consumption in both areas has been a sharp increase in the share of total generation supplied by fuel burning steam plants and the corresponding decline in the portion of total loads supplied by hydroelectric power. Natural gas is now available in 46 of the 48 contiguous States, and in 43 of these gas is used to some extent for electric generation.

Table 22 presents projections of future electric utility gas consumption developed by the Commission's Bureau of Natural Gas in cooperation with the Fuels Advisory Committee. The projection of 4 trillion cubic feet of gas for electric generation in

TABLE 22

Consumption of Natural Gas by Electric Utilities
(Trillions of cubic feet)

FPC Regions	Actual	Estimated	
	1960	1970	1980
I, II and III plus Illinois and Wisconsin [1]	0.33	0.30	0.30
IV and VI less Illinois and Wisconsin [2]	0.20	0.41	0.77
V (South Central Region)	0.81	1.55	2.16
VII and VIII (Northwest and Southwest Regions)	0.39	0.74	0.83
Total	1.73	3.00	4.06

[1] (Northeast, East Central and Southeast Regions plus Illinois and Wisconsin.)

[2] (North Central and West Central Regions less Illinois and Wisconsin.)

1980 is twice the 1962 usage. A detailed account of the basic assumptions and analyses underlying the projections appears in the report of the Fuels Advisory Committee No. 21, p. 315 of Part II.

FIGURE 30 *A link in America's network of major natural gas pipelines is coated and wrapped for extra protection against corrosion before it is placed in the trench. The 190,000-mile network provides the nation with a transport system for the economic supply of natural gas to many areas and for many purposes including its use as primary or interruptible fuel for steam-electric generating stations.*

The projections of future gas consumption by electric utilities, table 22, are based purely on market trends. These projections do not reflect any policy decisions by the Federal Power Commission on the use of gas for boiler fuel and are not intended to imply any prediction of future Commission policy in exercising its regulatory responsibilities in this area.

In table 22 Illinois and Wisconsin are grouped with FPC Regions I, II, and III because they are similar to the other States in those regions in their predominant use of coal as fuel for electric generation. In those areas, it is expected that most of the gas used for future electric generation will be on an interruptible basis. Competition from coal and from nuclear fuels and the expiration of old low-priced gas contracts are likely to prevent a significant net increase in electric utility gas consumption in this section of the country.

Region VI, and the portion of Region IV west of the Mississippi, represent a mixed fuel area with varied competitive situations and generally low delivered gas costs. Gas is projected to maintain its share in this area. The major market for fossil fuels in the Far West (Regions VII and VIII) is in Region VIII which includes California, Arizona, and Nevada, a high fuel cost area in which gas is now the dominant fuel for generation. The projected slowdown in the growth of the boiler fuel market during the 1970's largely reflects the expectation of nuclear competition.

In Region V—the South Central Region—which includes over 90 percent of the Nation's known gas reserves, gas has a substantial competitive edge. However, some load centers are closer to deposits of coal or lignite than to the closest gas fields, and the economic attractiveness of these competitive sources is increasing. The projection for Region V assumes that gas will be the source of 80 percent of the total generation in the region in 1980, and that more than half of total boiler fuel sales of gas will be concentrated in this region.

Interfuel competition, primarily with coal, is expected to limit increases in the cost of natural gas for electric generation to about the present levels in most sections of the country. In the gas producing areas, however, natural gas enjoys a substantial current price advantage with respect to other fuels and thus could increase in price without materially affecting its competitive position. Comparison of the present price of gas in any particular location with limiting prices of competing fuels provides a rough measure of the extent to which the price of gas for power production has room to increase.

Oil

Residual oil, the only fuel oil used in significant quantities for electric generation in the United States, is an oil refinery byproduct which remains after the more valuable refined liquids have been extracted and solids have been removed. Since it is a byproduct, residual oil is supplied in amounts which depend primarily on the market for other refined oil products. Residual is only a small proportion (9.6 percent in 1962) of the total barrels of refined oil products produced domestically, and

nearly one-half of U.S. residual oil consumption is supplied by imports. The availability and price of imported residual depends on U.S. import restrictions as well as the world supply and demand for petroleum products.

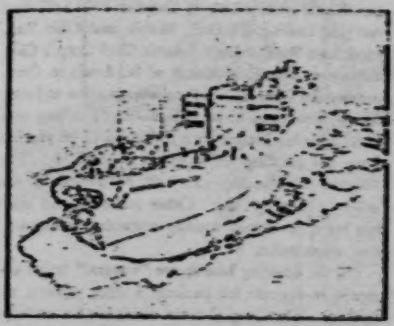


Figure 31 This ship, typical of the modern super-tanker, which carries crude oil to Atlantic Coast ports from southeastern producing areas and crude and residual oil from foreign ports, has a cargo capacity of 66,000 long tons and a draft fully loaded of 42 feet. Refinery residual oil is used extensively as fuel for steam-electric plants along the Atlantic, Gulf and California coasts.

Residual fuel oil finds its market along the east and west coasts together with some of the areas bordering the major inland waterways. Residual oil can compete with other fuels only where waterborne transport is available. In much of this area, however—especially in the northeastern United States—it provides a competitive influence that would not otherwise exist and thus operates to reduce prices of other fuels to the benefit of the consuming public. Residual oil is purchased by the barrel and a barrel roughly equals one-fourth of 1 ton of coal in heat equivalent. The current average price is approximately $2.10 a barrel, the equivalent of 35 cents per million Btu. In 1962, residual oil was used to produce about 7 percent of total thermal electric generation, but it constituted 27 percent of the fuel used for generation in the Northeast (FPC Statistical Region I).

U.S. import policies are an important factor in the consumption of residual oil by electric utilities as well as other users. A policy of easing import restrictions could be expected to intensify interfuel competition and possibly expand the area within which residual oil competes with other fuels. The effect upon the use of other fuels would depend upon the ability of the various fuels to counter residual's lower price. The overall merits of such a policy depend on complex considerations involving many aspects of the national interest which are beyond the scope of this Survey. The dependence of residual oil availability and price on our international and domestic policies and on world oil markets sets this fuel apart from the other fossil fuels in that it is less amenable to accurate projection based on normal reserve calculations and economic and technological factors. Our projections that residual oil will supply a somewhat smaller share of the market in the future reflect the possibilities of appreciable reductions in the cost of using coal and nuclear energy.

Nuclear

According to the Atomic Energy Commission "reasonably assured resources" of uranium and thorium have a total energy content of more than 94,000 Q [4] but with the existing technology of mining and concentrating nuclear materials only 3/10,000 of this total or 28 Q, could be mined at current cost levels. For comparative purposes, the annual basic energy consumption of the United States (coal, oil, gas and hydro) is about 0.05 Q and recoverable fossil fuel resources are estimated at 15 to 20 Q [5] but may be much higher. Of this amount, perhaps 6 Q is available at current costs.

While the estimate of 28 Q of nuclear fuel represents a very large reserve, the discussion of nuclear fuel resources can be misleading unless we consider the low efficiency with which nuclear fuel is now utilized and the prospects for improving that efficiency. Present reactors utilize nuclear energy with an efficiency of only about one percent of the potential energy in nuclear fuel. As a practical matter no energy is presently realizable from thorium reserves (about 6 Q of the 28 Q). In total,

---

[4] A "Q" is a billion billion (10^{18}) Btu, and corresponds to the heat content of about 40 billion tons of high grade coal.

[5] Total recoverable coal reserves for the continental United States excluding Alaska are estimated at 850 billion tons, equivalent to about 15 "Q", but this assumes only 50 percent recovery. Proven oil and gas reserves estimated on a much more conservative basis represent about 1 "Q".

the nuclear energy obtainable with present technology from uranium minable at about current costs thus represents less than one Q rather than 28 Q. While this is only a portion of the ultimate nuclear potential, it is still several times as large as the projected use (at existing efficiencies) of nuclear plants built during the survey period and the technology can be expected to make much larger reserves available during this time. A further discussion of nuclear fuel reserves and the effects of high converter and breeder reactors on more efficient use of these resources is contained in chapter 5.

Fuel Transport Cost

Important reductions are being made in the transportation costs of all fossil fuels but the most impressive developments in recent years and in prospect for the near future relate to the transportation of coal. Further, transport costs account for a much larger proportion of the delivered fuel costs for coal than for natural gas and oil. For these reasons the following discussion of transportation costs is largely related to the movement of coal.

Railroad Transport

Coal is the largest single item of railroad traffic. Three-quarters of all coal tonnage shipped in 1962 utilized rail transport for part or all of the movement from mines to consumers. Coal shipments represent close to 40 percent of the freight tonnage and produce about 25 percent of the revenues of Eastern District railroads, which serve the major coal fields east of the Mississippi River.

After World War II, railroad freight rates on coal increased and the total tonnage of coal shipments by rail began to decline. In the late 1950's, the railroads reversed this trend of rate increases and began to adopt low rates for volume movements in an effort to increase tonnage. More recently, the railroad industry, with the approval of regulatory agencies, has adopted still lower "trainload" rates and in cooperation with electric utilities has been exploring new coal transport arrangements to lower costs and effect major reductions in rates for large movements of coal. Increasing competition from barge lines, the perfection of coal pipelines and the emergence of nuclear energy as an added competitor have been major factors spurring railroad action to reduce rates.

An important new development is the "unit" train operating between a single mine and a single generating plant with special equipment and tight scheduling of loading, unloading and movement, and often employing utility owned coal cars. A recent example of such an arrangement is the 126-car shuttle train which in October 1964 will start carrying coal on the Gulf, Mobile and Ohio Railroad from Southwestern Illinois Coal Corp.'s Captain mine located southeast of St. Louis to Commonwealth Edison Co.'s generating station at Joliet, Ill., a distance of about 300 miles. The new rate of $1.30 a ton represents a reduction of 49 percent from the existing rail-barge rate of $2.56. The 100-ton swivel-dump cars will be owned by the utility. (See fig. 32.) Other railroads and utilities have developed equally attractive transportation movements.

On the drawing boards are "integral" trains designed to operate for perhaps a week without refueling. The integral train consists of very large cars permanently coupled to power units interspersed among the cars. The cars are designed for rapid automatic unloading and are insulated and heated to avoid the problem of frozen coal. Integral trains will operate at passenger train speeds with remote control of all features from the head of the train. Train capacity would be about 35,000 tons in contrast to today's big trains of 7,000 to 10,000 tons. A control car at each end of the train would permit shuttle service without the necessity for turning at either end of the run. A key factor in the integral train's economy is its short "turn around time" from loading at mine to unloading at power plant and return, with major savings in the fixed charge component of cost.

The availability of sharply reduced freight rates for large volume movements of coal to steam generating plants has added a new and very large additional element of savings realizable in providing generating capacity in large units and stations. Larger generating units are more efficient and less costly per kilowatt in themselves. But the savings in coal transportation rates from the volume movements they make possible provide additional savings which are perhaps just as large or in some cases even larger than the savings in the cost of generation.

Volume movements and improved techniques of coal transportation can be expected to permit substantial reductions in railroad rates for coal by 1980. Figure 33, based on the study by the Fuels Com-

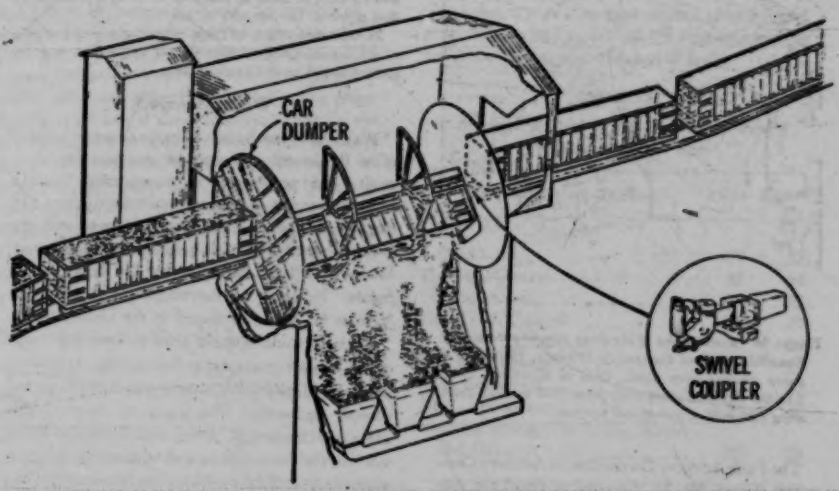


FIGURE 32 *Unit Train of the Commonwealth Edison Company is typical of newly developed specialized trains which can move coal from the mine to large power stations at greatly reduced costs because of simplified operations and shortened round-trip elapsed time. Each of these trains can carry in the order of 12,000 tons of coal.*

mittee, compares 1963 rates with the Committee's 1980 projection, and shows the large reductions in rail rates already in effect on volume movements of coal and the even greater reductions expected by 1980. With a high degree of automation even lower costs may be possible during the Survey period.

Pipeline Transport

The technology of pipeline transport for oil and natural gas is well developed and highly efficient. Some improvement in economy is possible in the future with the use of pipe of larger diameter and of greater strength to permit higher pumping pressures.

A new development which has excited much interest is the movement of coal in slurry form by pipeline. The successful operation of a 108-mile-long coal-slurry pipeline in the 6-year period 1957–63 has demonstrated the economic and technical feasibility of this method of coal transport. (See fig. 34.)

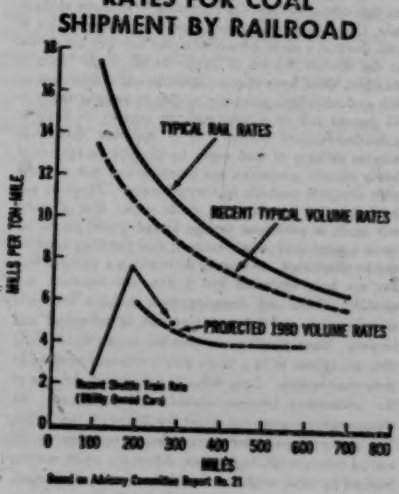


FIGURE 33

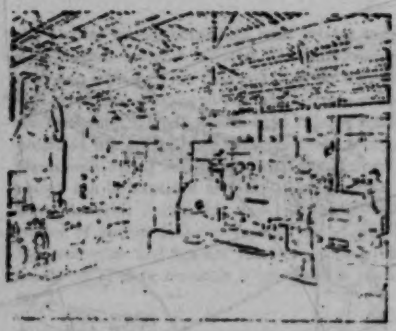


FIGURE 34 *View on one of the three pumping stations on Consolidated Coal Company's 108-mile, 10-inch, coal slurry pipeline from Cadiz, Ohio to Cleveland, Ohio. The line operated successfully from 1958 to 1963, delivering 1.25 million tons of coal per year.*

The Fuels Advisory Committee, in Advisory Committee Report No. 21, discussed in detail the considerations affecting a utility's choice of a coal pipeline *vis a vis* other modes of coal transport and summarized its findings as follows:

After moving over 700 million ton miles of coal, cross-country shipment of fine coal has been amply demonstrated on Consolidation Coal Co.'s pipeline from Cadiz to Eastlake, Ohio. A successful demonstration of direct firing of coal slurry in a cyclone burner furnace has been conducted at the Warner Station in South Amboy, N.J. Tests at Eastlake, Ohio, have demonstrated the use of filter-pulverizer and centrifuge pulverizer system to dewater slurry to 22 percent and 18 percent moisture content for firing in pulverizer-furnace burner. It is apparent that large volume delivery of coal slurry by pipeline to centers of heavy electric generation are practical and can compete with alternate methods of transportation. Pipelines can be designed to handle lower grade coals. Use of slurry will result in additional savings at new power plants because a great deal of conventional coal handling facilities can be eliminated. Storage of inventory is a problem that has not been optimized but it does not represent any obstacle. Tests and demonstrations indicate that coal slurry can be used for cyclone as well as pulverized coal burners. Since pipelines are installed underground, there does not appear to be a major public relations problem in their construction. Once a line is constructed, because of the relationship between variable and fixed costs, the transportation component of cost should remain very stable. This protects against inflationary factors but deprives the user of future technological cost reductions which may be realized by other methods of coal transport. At present, there are legal problems in obtaining right-of-way. Every effort should be made to eliminate these legal problems so that pipelines can compete on merit.

In the construction of large electric generating plants of the future, transportation of coal by pipeline must be given full and careful consideration.

Water Transport

Water transport by inland barge or ocean vessel is often the lowest cost mode of transport for oil or coal. The possibilities of transporting liquified natural gas (at a temperature below minus 116 degrees Fahrenheit) are being explored and the technical feasibility of this form of transportation has already been demonstrated for ocean movements. However no movements of liquified gas have so far been introduced in the United States.

Costs of transshipment tend to limit the availability of water transport to fuel sources near waterways and to generating stations which can be served directly by water. The waterway developments along the Mississippi, Ohio, and Tennessee River systems, the Great Lakes, and at coastal points provide many locations which can be served by the water carriers. (See fig. 35.)

A key element affecting the costs of water transport is the limitations which the physical characteristics of our waterways impose upon the barge or vessel. For example, the sizes of individual barges

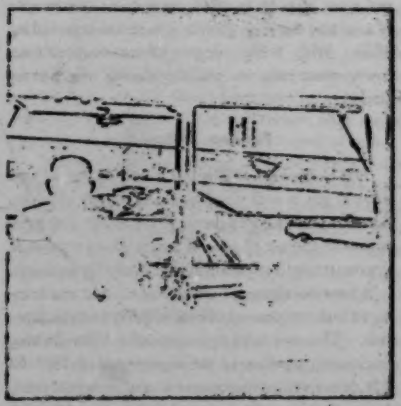


FIGURE 35 *Slack water barge navigation on the Nation's network of developed waterways economically moves large tonnages of coal to dock-side power plants.*

and groups of barges or "tows" (propelled by a single tow-boat) are controlled by the size of the locks and depth of the navigable channels. The outlook for lower rates on shipments by barge on the inland waterways is therefore limited by the physical characteristics of the waterways which do not lend themselves to ready expansion of tow sizes and quick turn-around equipment. However, increased tonnage on our waterways, larger locks, and stiffer competition from the railroads are factors which suggest that lower rates may be in the offing. Reductions in coastal coal and oil transport rates through use of special barges and tugs are also possible.

Transmission of Electric Energy

An alternative to the transport of fuels from their sources to electric generating stations is the transmission of electric energy at high voltage from generating stations located near the fuel sources. It will suffice here merely to point out this alternative. The technical and economic considerations affecting this choice are discussed in chapters 9 and 10. Indications of the manner in which this alternative is likely to develop during the next two decades are given in chapter 15.

Comparison of Delivered Energy Costs

Table 23 presents, region-by-region as well as for the Nation as a whole, the average cost of fossil fuels delivered to electric generating plants in 1962 and an estimate for 1980. The estimates for 1980 reflect the influence of such factors as an increasing proportion of mine-mouth as opposed to load center generation as well as anticipated improvements in the cost of mining and transport of fuels.

TABLE 23

Average Delivered Cost of Fossil Fuel
Cents per Million Btu

FPC Statistical Regions	1962[1]	1980[2]
I. Northeast	31	25
II. East Central	25	18
III. Southeast	24	21
IV. North Central	26	20
V. South Central	20	20
VI. West Central	26	18
VII. Northwest	23	23
VIII. Southwest	34	30
National average (excluding Alaska and Hawaii)	26	21

[1] Based on FPC and EEI data.
[2] FPC Estimate.

Conclusions

It is impossible to predict the combined effect of the considerations discussed in this chapter with respect to each fuel and each mode of fuel transport, including the alternative of electric power transmission. Nevertheless, as table 23 indicates, it would appear that we can expect a downward trend in the delivered cost of fuel in most locations.

CHICAGO SUN-TIMES

October 19, 1967

Pages 1, 4

DEFENDANT'S EXHIBIT 151

Chicago's Dirty Air —A Growing Peril

Because air pollution is a growing threat to the health of every Chicago area resident, The Sun-Times assigned medical writer Dick Kirschten to conduct an intensive investigation into the problem.

While looking into the causes—and possible cures—of Chicago's filthy air, he interviewed scores of government officials, medical and scientific experts, and just plain angry citizens.

The first of his reports is presented today.

By Dick Kirschten

Those teary-eyed residents of smog-shrouded Los Angeles are breathing cleaner air than we are here in Chicago, according to the U.S. Public Health Service.

*U.S. Public Health Service

In fact, the PHS report issued last summer rates the Chicago area's air pollution problem as the most severe in the country, with the exception of New York City where the air has been described as the filthiest in the world.

At that, Chicago is ranked even worse than New York and other cities when it comes to spewing poisonous and corrosive sulphur dioxide gas into the air.

And sulphur dioxide, as defined in the Medical World News, a leading professional magazine, is "(a) poisonous (which can) cause chest constriction, headache, vomiting, and death from respiratory ailments."

The reason that Chicago's air is full of sulphurous gases is no mystery.

According to the PHS estimates, more than 11,500,000 tons of pulverized soot and sulphur are shipped across the prairie each year in the form of soft coal from the mine-fields of southern Illinois.

U.S. Bureau of Mines statistics show that nearly two-thirds of Illinois' coal production falls into the category of "high sulphur content." The remainder falls into the "medium sulphur" range.

None of the coal mined in the relatively nearby southern Illinois and western Kentucky fields qualifies as low sulphur fuel—fuel is, having a sulphur content of one per cent or less.

At this soft coal is burned in the six-county Chicago metropolitan area each year, 1,671,000 tons of sulphur dioxide gas are belched into the atmosphere, the PHS says.

City of Chicago figures show that 3,000,000 tons of coal—nearly all of it the southern Illinois variety—are burned within the city annually, producing more than 300,000 tons of sulphur dioxide gas.

Commonwealth Edison's generating plants burn two-thirds of this soft coal, the city figures show. The city's next largest category of coal consumption is residential heating, which accounts for about 1,200,000 tons annually. Industrial and commercial sources combine to burn another 1,500,000 tons.

Methods for removing sulphur dioxide from smoke and stack gases are still considered experimental and are not in common use. None of the coal burned in Chicago is subjected to any sulphur dioxide controls.

Chicago's air pollution ordinance places no restrictions on either the sulphur content of fuel or the emission of sulphur dioxide gas.

Other cities, notably New York and St. Louis, recently have enacted restrictions in an effort to clear their air. Los Angeles has had rules controlling the emission of sulphur dioxide since 1948.

Sulphur dioxide is an invisible gas. Most Chicagoans are visually quite aware that the area also is plagued by more obvious forms of air pollution.

Ordinary specks of dirt in the air—the air pollution professionals call them "suspended particulates" — also contributed to the Chicago area's low ranking.

Among the 88 metropolitan areas compared in the PHS

report, Chicago tied for seventh place when it came to concentration of particles of dirt in the air.

Much of this "particulate" matter is "fly ash," which also stems from the burning of coal. Other prominent sources of the ash are steel-making and the incineration of the vast amounts of garbage discarded each day.

Auto Biggest Offender

In terms of total volume of urban air pollutants, the biggest offender by far is the auto.

Pollution from cars was the third element in the PHS survey. The metropolitan areas were compared on the basis of gasoline consumption.

In terms of total gasoline consumption, Chicago ranked third with a total of 1.9 billion gallons. On the average, it was calculated that $12,000 gallons of gasoline are burned every year for each square mile in the six-county area.

Chicago's over-all low standing seems a rather dismal progress report when you consider that the city's efforts to abate air pollution date back 98 years. In 1874 — just three years after the smoke from the Great Fire had cleared—a citizens' association was formed to seek smoke control legislation.

In 1881, Chicago passed the nation's first civic air pollution ordinance, complete with a penalty clause.

Today, Chicago, has a highly regarded air pollution control program, replete with such modern electronic refinements as automatic air samplers, computer systems and a "spy in the sky" remote-control television camera.

More than 15 million tons of coal are burned in the six-county Chicago metropolitan area each year, releasing 1,071,000 tons of sulphur dioxide gas in the atmosphere.

Chicago area vehicles burn 1.9 billion gallons of gasoline each year. Exhaust air pollutants come from some $12,000 gallons of gas used for each square mile.

Children on their way to school pass steel mill chimneys at 87th and Burley that pour out black smoke to add to Chicago's air pollution menace. Factories throughout city contribute to dirty air build-up. (Sun-Times Photo)

William J. Stanley, director of the city's program, describes the PHS ranking as "a grossly inadequate comparison." He also is quick to point out that the report refers not just to Chicago, but to the six Illinois counties of Cook, Du Page, Kane, Lake, McHenry and Will.

Two neighboring Indiana counties, Lake and Porter, which often have been implicated as contributing to Chicago's air pollution problem, were ranked separately. These counties, containing the steel mills of the Gary area were rated as having the nation's 11th most severe air pollution.

The authors of the PHS report concede their rankings are a rather "rough measure of the true severity of overall pollution problems."

Some pollution levels used in the calculations were projected for an entire metropolitan area on the basis of measurements taken at a single spot. Other levels are based solely on fuel consumption data rather than on actual measurements of pollutants in the air.

Weather Variations A Factor

A factor was included in the ratings to allow for weather variations from area to area which can profoundly affect the severity of the local air pollution situation. Los Angeles, for example, was penalized because of its unique propensity for long periods of air stagnation.

Despite all the qualifying factors, the rankings were issued with a statement expressing the conviction that "the list of cities arrived at gives a good over-all indication of the relative severity of their air pollution problems."

In other words, the U.S. Public Health Service is convinced that there is plenty of trouble in the air in Chicago—much of it in the invisible form of sulphur dioxide gas.

FRIDAY: Air pollution, respiratory disease and lung cancer.

DEFENDANT'S EXHIBIT 152

CHICAGO SUN TIMES

Page 44

June 26, 1969

ANTIPOLLUTION, ANTITRUST BILLS ARE SIGNED BY GOV. OGILVIE

Sun-Times Bureau

SPRINGFIELD, Ill.—Gov. Ogilvie Wednesday signed into law bills giving Atty. Gen. William J. Scott new powers to move against water and air polluters and a strengthened hand in antitrust actions.

Under the antipollution measures, the state receives the power to seek court action closing down polluters throughout the state.

In addition, fines for polluters are increased from $500 to $5,000, and jail terms hiked from 30 days to six months.

"Signing of these bills gives Illinois the toughest antipollution enforcement laws in the United States," Scott said in a statement.

One bill gives Scott power to enforce antipollution standards in Cook County. Previously, the Chicago Sanitary District and the city and county air pollution boards had exclusive enforcement jurisdiction.

Scott noted the antitrust legislation requires all state agencies to report two or more identical bids for investigation of possible collusive bidding.

In addition, he said, the new law gives him wide powers to move against price fixing and criminal infiltration of legitimate business.

DEFENDANT'S EXHIBIT 153

CHICAGO SUN TIMES
Page 37
July 14, 1969

Crackdown on air pollution!

Atty. Gen. William J. Scott has said he'll use strong new state powers to curb air pollution when cities fall down on the job. Good for him.

The air in Chicago, and other Illinois cities, too, is full of filth and there is precious little being done to purify it or even to make it moderately fit to breathe.

Chicago in particular has shown a reluctance to proceed against polluters despite an anti-pollution code adopted last year.

Last month, the City Council granted a year's delay in enforcement of limits on sulphur dioxide emission — which results from burning coal with a high sulphur content. Last week, the air pollution control appeal board found four steel firms to be behind schedule in agreed-to reduction of air pollutants. The firms were told merely to send in more frequent reports and to file them individually, rather than as a group.

There is no longer any excuse for softness toward those who befoul the atmosphere. Air is the stuff people breathe to live. When it is filled with noxious substances these are the things that enter people's lungs.

The Legislature gave the attorney general strong powers. They include injunctive power to close down plants that do not comply with state anti-pollution standards, and they include the power of criminal prosecution.

We welcome Scott's pledge that he will employ these tools, and hope his 25-man anti-pollution task force has good hunting. Anything that will bring polluters into line should be done — however harsh.

DEFENDANT'S EXHIBIT 154

CHICAGO SUN TIMES

Page 8

November 11, 1969

EDISON CUTS USE OF COAL, REDUCES AIR POLLUTION

By John Adam Moreau

The Commonwealth Edison Co., major contributor to air pollution in the Chicago area, reported it markedly reduced its burning of coal Monday.

A sharp drop in pollution was noted between early morning and midafternoon.

The company took the action on the fifth straight day of heavy smog.

As it did, the Businessmen for the Public Interest wiled a petition with the Illinois Commerce Commission saying Edison is guilty of "environmental violence" and should not be allowed the 6.1 per cent rate increases it seeks.

The commission is scheduled to begin a series of cross-examination hearings on the rate request, the first set for Wednesday.

The reduced burning of coal by Edison was important because the firm, according the city Department of Air Pollution Control, usually burns enough coal to create two-thirds of the sulphur dioxide pollution in Chicago.

Over-all, said William J. Stanley, the city's Air Pollution Control director, the generating of power causes one-fifth of the city's air pollution and Edison most of that one-fifth.

(The other over-all causes, each about one-fifth, are motor vehicles, refuse burning, space heating and other industry, said Stanley.)

Robert Lundberg, Edison's general staff engineer, said the company's action Monday means this:

Only 10 per cent of power for Chicago was being generated in Chicago; and 5 per cent of that power was created by coal burning, 5 per cent by natural gas. Ninety per cent of the power requirements came from generating plants outside Chicago, including facilities in Stickney, Downstate and in Wisconsin and Iowa.

These facilities burn coal, he said.

Lundberg said that he would confer with city officials Tuesday morning about restoring normal operations, providing the air has cleared sufficiently.

Meanwhile the Weather Bureau predicted that the conditions which have aided the air stagnation are beginning to change.

Weathermen said the high pressure system, which has been hanging over the area since Thursday, began inching eastward and fresher air began drifting in from the South.

Even the pollution statistics began to change. An early morning sulphur dioxide level of .25 of a part per million parts of air—2½ times above the danger level—eased down to .08 of a part by midafternoon.

Lundberg said Edison's action was taken on request of the city. He also said power was generated outside Chicago from Thursday afternoon through Friday morning, when coal burning was reduced.

Because power demands were less, the usual coal burning process was used Saturday and Sunday, Lundberg said.

The petition to the commerce commission, filed by attorney Joseph Karaganis, defined "environmental violence" as "the gross degradation of a natural environment with resultant damage to the medical and esthetic health of the community."

The businessmen's group is composed of a number of wealthy Chicagoans. Among its founders seven months ago was Gordon Sherman, president of Midas-International Corp.

Their petition stated, "Commonwealth Edison Co. could substantially reduce the amount of emissions of both sulphur dioxide and particulate matter. Low-sulphur coal is available in quantity. Devices are available which are

much more effective than those now used by Edison to trap particulate matter."

Asked why Edison cannot always use natural gas, Lundberg replied that not enough natural gas is available for Edison's needs. Asked whether, if Edison made it a policy to use natural gas, suppliers could accommodate their operations and stock enough, he said he doubted it.

He added that so far as he knew Edison never has tired to figure out whether it would be possible to switch to natural gas. The company expects to produce about 40 per cent of its power by means of atomic energy by 1973, he noted.

A spokesman for the Peoples Gas, Light & Coke Co. said there would be "complexities" in supplying a great increase in gas to Edison, mainly in accumulating large reserves supplies and in constructing the necessary tanks and pipelines.

Ward C. McCallister, president of Peoples Gas, told The Sun-Times his firm had tripled its sales of gas to Edison in the last year.

Stanley, the Air Pollution Control director, said Edison's equipment meets the demands of the city's pollution ordinance.

Asked whether he agrees with Illinois Atty. Gen. William J. Scott, who said air pollution has reached a "crisis," Stanley replied:

"That depends on how you define it. There are all kinds of air pollution problems and you have to devise special programs for each kind. Whether it's dangerous to you is up to a medic to say, not me."

DEFENDANT'S EXHIBIT 155

CHICAGO SUN TIMES
Page 2

November 13, 1969

8 UTILITIES FACE POLLUTION PROBE

By Donald M. Schwartz and Burnell Heinecke

The Illinois Commerce Commission on Wednesday ordered eight utilities to appear on Dec. 15 at an investigation into alleviating air pollution.

The firms ordered to appear are Commonwealth Edison Co.; Peoples Gas, Light & Coke Co.; Northern Illinois Gas Co.; Iowa-Illinois Gas and Electric Co.; Central Illinois Light Co.; Central Illinois Public Service Co.; Illinois Power Co., and Union Electric Co.

David H. Armstrong, commission chairman, acted on prodding from Gov. Ogilvie in the wake of six days of heavy air pollution in the Chicago area. Armstrong said in a press release:

"It is not the purpose of this proceeding to duplicate the enforcement of other agencies but rather to ensure that Illinois utilities are making the best possible use of available technology to produce needed energy at the minimal adverse effect on our environment."

Ducks Chicago question

Armstrong repeatedly turned aside questions at a press conference about the control of air pollution by the City of Chicago, saying the commission regulates utilities only.

But he did say that the commission has considerable power to require coal burning utilities, to install pollution control devices.

"We have broad powers," said Armstrong, "but as a practical matter I couldn't issue an order to shut Commonwealth Edison down and let the city go black."

Armstrong said further that his order tells People's Gas and Northern Illinois Gas Co. to give information at the hearing on the availability of natural gas.

The press conference was held in the State of Illinois Building, 160 N. LaSalle.

Earlier, Ogilvie had commented on air pollution in Chicago.

"It is clear from this episode that much too little was done too late," the governor said in Springfield as the persistent polluted haze was finally swept from Chicago skies by cool air from Canada.

The governor ordered Armstrong to obtain reports from major utility air polluters on their entire pollution abatement programs and on emergency plans for high pollution periods.

Ogilvie supported the order with the observation that the commission has legal power "to require every public utility to maintain and operate its plant in such manner as to safeguard . . . the public and . . . to require the performance of any other act which the health and safety . . . of the public may demand."

At the same time, the governor initiated a review which will include whether Chicago's exemption from state superivsion should be continued in the area of air pollution control.

3-area review

He directed Franklin D. Yoder, public health director, and Clarence Klassen, technical secretary of the Illinois Air Pollution Control Board, to examine three areas:

(1) State and city emergency anti-pollution plans and the means for making them more effective.

(2) The advisability of continuing to grant a state certificate of exemption to Chicago for control of air pollution.

Chicago has been permitted by the state to run its own show in air pollution control because it has its own pollution control department—just as the Sanitary District, until this year, was free of control by the state.

The district this year, however, was brought under the jurisdiction of the Illinois Sanitary Water Board.

(3) The City of Chicago's response to the just ended heavy air pollution.

In the meantime, lawyers in the State of Illinois Building, 160 N. LaSalle, wrangled over a Commonwealth

Edison Co. request for a 6.1 per cent rate increase while outside, pickets protested the utility's contribution to the air pollution burden.

At a brief hearing in the rate case, it was decided to postpone cross-examination of seven company witnesses, which was to have begun Wednesday, until Commonwealth Edison and opposing lawyers agree on cross-examination procedures.

DEFENDANT'S EXHIBIT 156

CHICAGO SUN TIMES
Page 8

November 18, 1969

CLEAN-AIR EDICTS OFFERED IN COUNCIL; DIMOUT SUGGESTED

By Harry Golden, Jr.

Two anti-administration aldermen proposed tough new measures to deal with air polluters, specifically the Commonwealth Edison Co., Monday in City Council.

Almost immediately Commonwealth Edison rejected the proposals, saying that the course of action it is taking to reduce air pollution is better.

The proposals came in the form of four resolutions, one by Ald. Jack I. Sperling (50th) and three by Ald. William S. Singer (44th).

Start to shout

All were referred to the Council's Health Committee. An administration-backed ordinance which would sharply increase fines for air pollution received support in the Council, but a vote was put off until the next Council meeting after a shouting match broke out on the floor.

Sperling's and Singer's resolutions were drafted separately, but all were aimed at combating conditions that led to the recent wave of air pollution in Chicago.

Sperling's resolution would direct the mayor, during times of air pollution alerts, to "call on industry, business and the general public to reduce their use of electricity to the lowest possible minimum" and to declare "power dimouts" until the pollution level was reduced.

Like war measure

Simultaneously, the mayor would urge suburban officials to join in the dimouts. Similar program to cut

down on consumer use of power were instituted during World War II.

Singer's resolutions are aimed at changing the city's current air pollution control ordinance, which would force companies to use coal with 2.5 per cent sulphur content or less beginning next July 5. The law calls for a gradual reduction to a 1.5 per cent maximum by the end of 1974.

Sperling had said that "the primary source of sulphur dioxide in Chicago and suburbs is the 9,000,000 tons of coal of high sulphur content consumed by Chicago industry and particularly by the Commonwealth Edison Co., which burns 6,000,000 tons of high sulphur coal, two-thirds of the total amount."

Proposals outlined

Singer's proposals call for:

(1) Scrap the gradual reduction plan for high-sulphur content coal, and replace it with an amendment demanding use of coal with 1.5 per cent sulphur content or below by next July. The amendment would apply to all fuel users in Chicago, and within a mile outside the city.

(2) Abandon a provision which allows a company to continue burning high-sulphur coal in some plants if it reduces usage of the coal at other plants. This is aimed at Commonwealth Edison's plan to burn gas and use nuclear power at some plants. Singer said that "sulphur dioxide emissions must be reduced at every plant every day."

(3) Insist upon the latest anti-pollution precipitators at plants "to insure the removal of 90 percent or more of particulate matter." Singer said that Commonwealth Edison's precipitators now work at about 97 per cent efficiency, and that the company still emits some 17,000 tons of particulate matter annually.

Singer also called for public hearings to determine why Commonwealth Edison says not enough low-sulphur coal is available. He said that "billions of tons of coal in Virginia and West Virigina contain less than 1 per cent sulphur."

At a press conference called while the Council meeting was still in progress, two Commonwealth Edison officials rejected the Sperling and Singer proposals.

Nuclear program

Saying that the resolutions are not "squarely addressed to the city's problem," James O'Connor, assistant vice-president, and Wallace Behnke, vice-president, outlined the company's plans for reducing pollution.

O'Connor said the company is reducing the amount of coal burned in Chicago generating stations by retiring older generating units in Chicago, by burning increased amounts of natural gas, and by proceeding with a $900,000,000 nuclear power program.

He said the nuclear generating units will enable the company to ultimately reduce the coal burned in Chicago by more than 50 per cent.

O'Connor said that existing furnaces cannot burn low-sulphur coal, and the company could not burn the coal by next July.

"It would take several years to modify these plants for a fuel which is not available in the amounts required," he said.

To ask exemption

Behnke confirmed that Commonwealth Edison will ask the city for an exemption from reducing the sulphur content in its coal next July. He said the company would base the request on its plans to phase out the use of all coal.

O'Connor denied that the company is Chicago's major air polluter. He contended that "even with a complete shut-down of Edison's six Chicago area plants, 98 per cent of the air contamination would remain."

At the City Council meeting, a vote on the administration proposal to stiffen fines against air polluters was deferred until the next meeting when Aldermen Leon M. Despres (5th), Claude W. B. Holman (4th), Seymour Simon (40th) and Singer began to argue the merits of the city's current plans to combat pollution.

"The mayor of Chicago has the best program in the nation," Holman said, and Despres and Singer rose to argue. Aldermen Fred B. Roti (1st) and Vito Marzullo (25th) then moved to table the motion.

Mayor Daley, obviously displeased with the vocal antics in the presence of several groups of visiting school children, said "That was a great demonstration before these fine children."

DEFENDANT'S EXHIBIT 157

CHICAGO SUN TIMES

November 20, 1969

MIKVA BILL WOULD MAKE AIR POLLUTION A FEDERAL OFFENSE

Sun-Times Bureau

WASHINGTON — Rep. Abner J. Mikva (D-Ill.) Wednesday introduced in the House a bill that would make air pollution a federal offense and set federal standards on pollution sources.

The bill, titled the Air Pollution Abatement Act of 1970, was cosponsored by 19 other congressmen, including Rep. Frank Annunzio (D-Ill.). It was sent to the House Interstate and Foreign Commerce Committee.

The bill calls for additional rules and private remedies for air pollution abatement, and would give citizens the right to sue in state or federal courts.

Fines up to $2,000 a day

Penalties of up to $2,000 a day are provided for polluters, and the secretary of Health, Education and Welfare would be authorized to set special standards where climatic conditions make air pollution especially dangerous to health.

The provisions would take effect when an "inversion" developed, as it did in the Chicago area earlier this month. An inversion is the trapping of pollutants by layers of air of different temperatures.

In such situations, the secretary would have emergency powers to shut down for up to 72 hours industries that contribute to air pollution. The offender would be required to continue paying wages during the emergency.

Mikva said the bill would make enforcement of stringent national air pollution standards the policy and practice of the United States.

Chicago's air unsafe

"If our cities are to be saved, they have to have breathable air for the people who live there," he said. He noted that preliminary results of a government study indicated that a large percentage of Chicago's population is breathing air polluted over twice the "safe level" established by medical authorities.

"Citizens of this nation know that our environment will continue to deteriorate as long as Congress coddles the polluters of the very air we breathe," he added.

The bill also calls for an enforcement of state and local standards by the federal government or injured citizens when local authorities fail to act.

DEFENDANT'S EXHIBIT 158

CHICAGO DAILY NEWS
Page 3
December 1, 1969

Pollution fight

Edison tells coal doubts

By Jay McMullen

An official of Commonwealth Edison Co. said Monday he is pessimistic about the company's ability to burn large quantities of low-sulphur coal.

Nevertheless, said Byron Lee, assistant to the president, Edison will try to burn 300,000 tons of low-sulphur coal next year compared with the 30,000 tons it burned in the last five months.

The company burns 6,000,000 tons of coal a year, most of it high-sulphur. High-sulphur coal creates a higher quantity of dioxide, a major air pollutant.

THE CITY Council has ordered industry to reduce the sulphur content of its coal to 2.3 per cent by July 1, 1970, and 1.5 per cent by 1974. Edison, which mainly burns coal of about 3.5-per cent sulphur, has said it will not be able to meet the council's deadlines.

Lee said at a press conference that Edison's tests of low-sulphur coal, which ranged in sulphur content from 1 to 1.5 per cent, turned up these defects:

- The coal created twice as much air-polluting particulate matter as high-sulphur coal.
- It cost twice as much as high-sulphur coal to produce an equal amount of heat.
- Slag runoff caused a rock-hard residue that had to be chipped off a boiler with a jackhammer.
- It is difficult to get it mined and shipped to Chicago "on a regular and dependable basis."

LEE SAID Edison's low-sulphur coal came from Wyoming and Montana, and not from Virginia and West Virginia where billions of tons of low-sulphur coal are said to exist.

He said the Eastern coal causes high amounts of slag that clogs up boilers, cannot be ground in Edison's coal grinders and causes even more particulate matter than Western coal.

Lee added that it would cost Edison $15,000,000 to $20,000,000 to shift entirely to low-sulphur coal.

He said the company will use only 4,000,000 tons of high-sulphur coal next year and will drop to 2,000,000 to 2,500,000 tons by 1974.

DEFENDANT'S EXHIBIT 159

THE WALL STREET JOURNAL, Wednesday, January 7, 1970 19

'Black Diamond' Boom: Kleenburn Coal Mines Enjoy Demand Surge

• • •

Air-Pollution Worries Spark Orders for Low-Sulphur Fuel Mined in Big Horn Mountains

By a WALL STREET JOURNAL Staff Reporter

KLEENBURN, Wyo.—This tiny, north central Wyoming town, named for the clean-burning coal mined here, is suddenly enjoying a boom, thanks to growing public concern over air pollution.

Coal has been mined in this section of the historic Big Horn Mountains since the days when Buffalo Bill Cody operated the nearby Sheridan Inn. But until recently its low sulphur content didn't seem to attract much demand for Kleenburn's "black diamonds."

Now, however, large orders for the coal from such distant utilities as Chicago's Commonwealth Edison Co. and Kansas City Power & Light Co. have forced Big Horn Mining Co., into double work turns. Big Horn Mining is a subsidiary of Peter Kiewit Sons' Co., an Omaha-based construction concern.

Instead of being shipped a few carloads at a time, Kleenburn coal is being loaded into unit trains of 60 to 65 cars each, reports the Chicago, Burlington & Quincy Railroad, which serves the area. The Burlington says it has had six unit trains in operation since Dec. 10 and plans 34 more. The road currently runs three loaded trains each week to handle the mine's output.

To further enhance the sudden appeal of Kleenburn coal, the Burlington says it cut the shipping rates to Kansas City to $8.26 a ton from $8.60 and to Havana, Ill., to $8.43 a ton from $11.30. From Havana the coal is barged to Chicago.

DEFENDANT'S EXHIBIT 160

WALL STREET JOURNAL
Page 1
March 19, 1970

Business Bulletin

A Special Background Report On Trends in Industry and Finance

POLLUTION CRACKDOWNS convince companies to close some facilities.

They find it more economical than trying to equip marginal plants with costly antipollution controls required by many governmental units. Giant Portland Cement Co. phases out a 65-year-old plant at Egypt, Pa., rather than spend $1 million to comply with Pennsylvania's air pollution control law. Jones & Laughlin Steel Corp. will close parts of its Pittsburgh iron foundry for similar reasons. Ohio Edison Co. decides to phase out four, occasionally used, coal-fired generating units in Toronto, Ohio, when restrictions tighten, rather than install new controls.

The pace of closings is expected to increase as enforcement agencies step up activities. "We'll lose one-third of the 1,000 gray iron foundries" when air pollution codes are in effect across the country, says a spokesman for the Gray and Ductile Iron Founders Society in Cleveland.

The Texas Air Control Board claims it was influential in getting two lumber companies, a feed supplement plant and a lime plant to close last year.

• • •

DEFENDANT'S EXHIBIT 161

MID-WEST COAL PRODUCERS INSTITUTE, INC.
307 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60601
AREA CODE 312 - TELEPHONE FINANCIAL 6-7447

OFFICE OF
THE PRESIDENT

THE NEWS THAT NOBODY PRINTS

Dear Sir:

The sulfur dioxide level in the Chicago area has declined steadily over the last six years. The attached chart illustrates this improvement. In 1968 and 1969 the level was well below the suggested goal of less than .040 parts per million as published in the U. S. Department of Health, Education and Welfare Criteria.

This improvement in the ambient air is due entirely to the voluntary efforts made by Chicago citizens, since the sulfur restrictions of the Chicago Air Quality ordinance do not become effective until July 5, 1970.

The 1969 average sulfur dioxide level of .026 parts per million was reached five years ahead of the schedule projected by the coal industry when the ordinance was being considered.

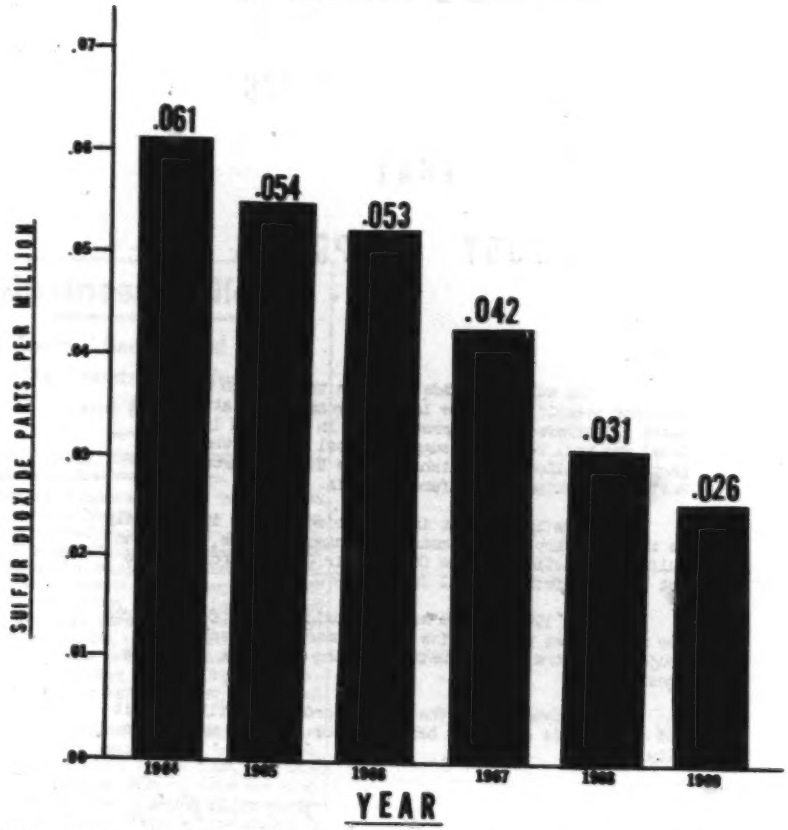
Enforcement of the Chicago ordinance will prohibit 86% of Illinois coal from being sold or consumed within the city.

Very truly yours,

Otis J. Gibson

Otis J. Gibson
President

CHICAGO AIR YEARLY AVERAGE SULFUR DIOXIDE



Source: Chicago Department of Environmental Control Statistics; Figures shown are the arithmetic average of the 24-hour averages for the 20 station network in the Chicago area.

Prepared By: Mid-West Coal Producers Institute, Inc.
February, 1970

DEFENDANT'S EXHIBIT 162

New Ruckus on Foreign-Oil Imports to Pin Nixon Between Pollution Issue, Coal Groups

By Burt Schorr
Staff Reporter of The Wall Street Journal

WASHINGTON — Last month, President Nixon sidestepped a possible collision with the oil industry over a Cabinet task force proposal to replace existing oil-import quotas with a system of tariffs. He adroitly delayed final action, possibly until after Election Day.

A new foreign-oil ruckus is heading Mr. Nixon's way, this time involving the coal industry, and it's doubtful the President will be so lucky in finding a safe neutral corner.

The conflict—currently working its way toward the White House through the Oil Import Appeals Board deep in the Interior Department—grows out of a request by Commonwealth Edison Co. to import foreign residual oil to fuel its Ridgeland generating station just outside Chicago's city limits. When Mr. Nixon approaches this question, however, he'll find his Administration uncomfortably pinned between two larger and politically more troublesome issues.

Air Pollution Rhetoric

On one side is the credibility of Nixon Administration rhetoric about wanting to clean up the environment. Commonwealth, to meet a 1970 commitment to help improve the quality of the air Chicagoans breathe, wants to substitute low-sulphur-content imported oil for the high-sulphur-content domestic coal currently being burned at Ridgeland. Thus a rejection of the utility's import application could be interpreted as meaning the Nixon Administration really doesn't care much about clean air. Deferring final action—as was done on the task force proposal—could lead to much the same interpretation and hurt Republicans in the fall election.

On the other side are the coal industry and the fact that existing oil-import regulations dating back to 1959 have permitted only a relative trickle of foreign residual oil (the molasses-like end-product of some refinery processes) into the important 19-state midcontinent region known as District II, which includes Chicago.

Coal representatives argue that once this barrier is breached, many other District II coal burners with air-pollution problems will flock to Washington to obtain foreign oil rights for their plants—the substantially higher cost of oil notwithstanding. This would mean a serious setback for coal demand in the 19 states, which currently account for more than half of total yearly U.S. coal use. As a result, the coal argument runs, promising techniques for removing most of the sulphur from stack emissions of coal-fired plants will languish for lack of interest, and investors will be leery of risking their money in development of new coal mines.

Coal-Industry Opposition

A number of Capitol Hill heavyweights from coal states, whose views can't easily be ignored by the White House, already have been mobilized behind these arguments by the National Coal Policy Conference and the National Coal Association, two major industry lobby groups. Together with the United Mine Workers union, they represent the chief formal opposition to the Commonwealth Edison application.

Rep. Edwards (D., Okla.), chairman of the House Mines and Mining subcommittee, for example, wrote the Oil Import Appeals Board that "the precedent-shattering nature of Commonwealth's application, if approved, will have seriously harmful effects upon our country's economic posture and national security. Apparently, Commonwealth has not concerned itself with the far-reaching effects approval of their application would have on similarly situated industries. . . . It is difficult for us to see how the many, many additional applications which would inevitably follow could be treated differently."

For the oil import board, at least, such appeals don't seem to have had much effect. The panel's chairman, Lewis Flagg III, an Interior Department employe, hasn't released the Commonwealth ruling. The board's other two members, Stanley Heginbotham, Deputy Assistant Commerce Secretary for Resources, and Paul H. Riley, Deputy Assistant Defense Secretary for Supply, who constitute the necessary majority, have signed a finding that the utility is faced with "exceptional hardship" and should get 4.5 million barrels of imported residual oil in the 12 months starting April 1.

Opinion Dismisses Objections

The majority opinion dismisses coal-industry objections and seems to open the door wide to other foreign-oil applicants. The opinion states that the "basic issue . . . is not one of coal versus oil since the petitioner has made a decision to discontinue burning coal as a basic fuel at the Ridgeland station under any circumstances." The opinion notes that Commonwealth did get a belated offer of domestic residual oil from Standard Oil Co. (Indiana), but this fuel would contain 70% more sulphur than the foreign oil and cost a third more.

A formal appeals board decision, however, will represent only a first step through the oil import labyrinth for Commonwealth. Next, it's up to Interior Secretary Hickel to fit the ceiling on residual oil imports into District II, currently set at a more 210,000 barrels yearly. Presumably such action first would have to clear the President's new interagency committee on oil import policy and perhaps the White House itself. Routine issuance of an import license by the Oil Import Administration would follow.

New Ruckus on Foreign-Oil Imports to Pine Nixon Between Pollution Issue, Coal Groups (Continued)

Interior Department officials insist, though, that this emergency relief procedure, provided under the original Eisenhower oil-import proclamation, is the proper way to handle the backing of additional residual-oil applications building up rapidly in the appeals board office. So far, District II import license requests totaling more than 26 million barrels (equivalent to about six million tons of coal) are on file.

Extent of Demand Unclear

Just the other day, for example, Detroit Edison Co. asked for 8.6 million barrels in the 12 months beginning April 1 to provide back-up fuel for its Delray station. The plant normally burns pollution-free natural gas, but increasingly tight supplies of that energy source have increased the periods when its gas is diverted to home use. More critical, the utility says, is the fact that domestic refiners from which it formerly purchased residual oil aren't any longer offering to supply it.

There are strong indications, moreover, that the full extent of demand for foreign residual oil in the 18-state region has only begun to reveal itself. One District II case presently before the Oil Import Appeals Board involves a group of 12 oil-terminal operating companies, which hasn't specified how much residual oil its members would like to bring in. Elmer L. Hoehn, a member of the law firm representing the terminal operators (and formerly oil import administrator in the Johnson Administration) says his clients are still canvassing their customers' needs. Preliminary findings suggest that dozens of new local air ordinances will require "tens of millions" of barrels of foreign residual oil to satisfy them, Mr. Hoehn comments.

For the long term, it's obvious that the Administration must at least consider a broad policy change designed to make heavy industrial fuel oil as easy to obtain in District II and other districts as it is currently in the 10 eastern seaboard states comprising District I.

Oil Imports in Other Areas

In prior years, when the environment wasn't a major issue, residual oil use hinged largely on its transportation costs. Because it had easy tanker access to Venezuelan refineries, therefore, District I started out under the import program with an "historic" right to import vastly more fuel oil than all the other districts combined. In 1968, controls on foreign residual oil into District I were loosened to the point that, in effect, importers could bring in all they were able to sell.

The recent report of the Cabinet task force on oil-import control indicates broad support already exists within the Administration for opening the entire country to foreign fuel oil. The panel majority, representing five of its seven members, questioned the rationale of allowing imported heavy oil access to one region but not others. It said this inequity would be ended in the overall change to a tariff system. The minority members, Commerce Secretary Stans and Interior Secretary Hickel, also suggested that "consideration should be given to applying (District I) policy uniformly across the U.S.," even though the two dissenters would retain other features of the present quota system.

Most Venezuelan and U.S. crude oils actually leave the ground with sulphur levels close to those in coal, and the troublesome mineral eventually ends up in the residual product. However, there are well-established commercial processes for desulphurizing oil—an advantage coal still lacks. A number of companies currently are working on ways to remove sulphur dioxide, the gas produced when high-sulphur-content coal is burned, but many experts in the field believe it will be at least several years before all of the wrinkles are out of these techniques.

Meantime, frustrated coal executives have watched residual oil use mushroom in District I at the expense of their product. "In the 1966-67 period, after controls were dropped, 37 utilities from New England to Washington decreased their use of coal by 20% while increasing their consumption of oil by 84%," the National Coal Association told the Oil Import Appeals Board. "Almost without exception," the association said, oil also has been the fuel chosen for new East Coast fossil fuel plants. As a result, it said, coal "barely held its own" in District I between 1966 and 1968; in the first nine months of last year, its use actually declined, while oil use continued to grow.

DEFENDANT'S EXHIBIT 163

THE WALL STREET JOURNAL, Thursday, March 26, 1970 5

Commonwealth Edison Is Allowed to Import Low-Sulphur Fuel Oil

Hickel Says One-Year License Doesn't Establish New Policy; Coal Industry Fought Action

By a WALL STREET JOURNAL Staff Reporter

WASHINGTON — Interior Secretary Hickel granted Commonwealth Edison Co. the right to import 4.5 million gallons of low-sulphur residual fuel oil for its Ridgeland power station near Chicago.

The import license, effective for the year beginning April 1, had been opposed vigorously by the coal industry, chiefly on the grounds that foreign residual oil previously hasn't been licensed for use in Midwestern or Southern states and that its admission at this time would sharply cut coal sales. The conflict had placed the Nixon Administration in a squeeze between influential coal-state lawmakers on Capitol Hill and a desire to maintain its clean-environment reputation.

Demand for low-sulphur foreign residual oil is building in many localities because of new air pollution control ordinances. Because of technological changes, U.S. refiners currently have little residual oil to sell. Coal is a substantially cheaper fuel, but commercially acceptable methods for removing sulphur from coal fire stack emissions still are only under development.

Secretary Hickel said he is granting Commonwealth Edison's request "in the interest of curbing air pollution in the Chicago region." He emphasized, though, that his decision is based "on a very special set of circumstances and does not represent establishment of a new general import policy for low-sulphur residual fuel oil." A test of such policy is likely to occur in the near future as the Interior Department handles a number of requests similar to Commonwealth's.

U.S. NEWS & WORLD REPORT

DEFENDANT'S EXHIBIT 164

THE REAL MEANING OF ALASKAN OIL FINDS

Benefits for all the U. S. are to flow from Arctic oil fields in the 49th State.

Potential output would double the nation's proved reserves. Enough oil to meet all demands is assured even if U. S. were cut off from other sources.

Huge pipeline is to carry oil down through Alaska for shipment to the West Coast, bringing initial benefits to that region.

Reported from
NEW YORK AND WASHINGTON

The full meaning of recent oil strikes in northern Alaska is suddenly becoming clear to industry experts and Government officials.

The essential fact is that Alaskan finds will make the U.S. self-sufficient in reasonably priced oil for the foreseeable future.

Almost overnight the U.S. appears to have doubled its petroleum reserves.

Vast new pool. The center of world oil exploration will now move to the Arctic—U.S., Canadian and Russian—says Walter J. Levy, a top international oil consultant.

Source of all this interest is a pair of wells on land near the Arctic Ocean's Prudhoe Bay. Atlantic Richfield Company and a subsidiary of Standard Oil Company (New Jersey) drilled them last year. Result: DeGolyer & MacNaughton, a Dallas oil-consulting firm that announced the strikes, estimated a pool holding 5 to 10 billion barrels of oil had been hit.

Oil companies have been racing for drilling rights on what's called Alaska's North Slope ever since. But only now are the experts putting together a clear picture of what the Prudhoe Bay discoveries mean. And that picture is bright.

Alaska may be the biggest and most important oil discovery since Middle Eastern fields were found.

Outlook: Independence. Before Prudhoe Bay, the U.S. faced the prospect of having to import 30 per cent of its oil needs by 1980. Either that, or the price of oil would have had to be artificially pegged here at around $4.20 a barrel, compared with about $3 today, in order to boost production from high-cost wells, oil shale and coal.

Now, however, the U.S. will be able to hold prices at present levels, or possibly even let them drop somewhat. The Government generally keeps oil prices at home about double the price of oil in the world market by restricting imports. Imports are set at 12.2 per cent of demand.

Americans, with Alaskan oil coming in, will not have to rely on production in Arab-ruled lands of the Mideast, in Venezuela or even in Canada for gasoline, heating oil and other products made from petroleum.

Counting the riches. How much oil is there in Alaska? No one knows the answer yet. The estimate of 5 to 10 billion barrels for the Prudhoe Bay field is for just one geological "structure." And there are an estimated 10 to 20 similar structures in the North Slope region alone.

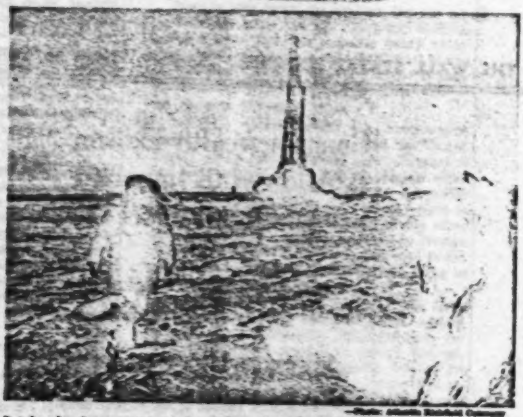
Even oil men with reputations for conservative estimates are projecting 40 billion barrels for the North Slope if present soundings continue to prove out. You see how much oil that is by comparing it with total reserves for the rest of the U.S.—only 32.5 billion barrels, according to "The Oil and Gas Journal," trade magazine for the industry.

And that isn't all. Alaska also has nine other geological areas like the North Slope—"sedimentary basins"—where oil might be found. It is no wonder that Mr. Levy says every large U.S. oil firm will have an "absolutely compulsive need" to hunt for oil in the Arctic once the large size of the resources is established.

For domestic use. Where will all this oil be sold? Only in the U.S., say the experts. Europe, Japan, other oil-hungry regions will not get any.

Reason for this is simple economics. Oil sold in the U.S. brings $3 a barrel, compared with about $1.50 abroad. The only thing that would change this pattern would be discovery that the Alaskan oil is so cheap to produce it could compete against Midwestern crude oil. And that isn't considered likely.

Pipeline-construction plans just unveiled by three companies with the big-



—Photo: Atlantic Richfield Company

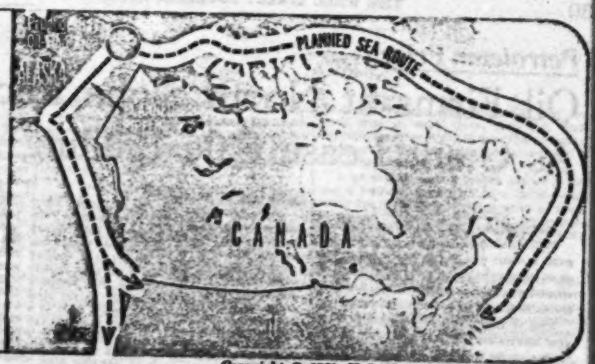
It takes hardly more to tend the drilling rigs in Alaska. The recent discovery of a vast new field near the Arctic Ocean may have doubled U. S. petroleum reserves.

TAPPING ALASKA'S OIL WEALTH —

Vast oil discoveries at Prudhoe Bay, on Alaska's North Slope, can help keep the U. S. self-sufficient in oil — if transportation can be arranged at reasonable cost. Map shows two plans now in the works:

1. A pipeline across Alaska to the Cook Inlet area, where ships would pick up oil for West Coast ports.

2. An all-tanker route from Prudhoe Bay to the East Coast of U. S. via a Northwest Passage through islands north of Canada's mainland.



Copyright © 1969, U. S. News & World Report, Inc.

gest stakes in Prudhoe Bay—Atlantic Richfield, Jersey Standard and British Petroleum Company—show what is to happen.

Prudhoe Bay oil is to be piped to Alaska's southern coast, shipped to Puget Sound and other Pacific Coast points for processing and sale there. Atlantic Richfield already is planning to build a 100,000-barrel-a-day refinery near Bellingham, Wash., to process Alaskan oil. Other refineries may be built in Alaska.

The pipeline is to be one of the world's biggest—48 inches in diameter and 800 miles long. Initial capacity is to be 500,000 barrels a day, just about the amount of oil the West Coast is thought to need for self-sufficiency.

Ultimate capacity for the trans-Alaskan line is said to be 1.5 million-plus barrels a day. This indicates to oil-industry men that within a relatively few years a new pipeline probably will be built connecting the Seattle area with Midwestern industrial centers as far east as Chicago.

Trouble for Canada. Left out, as U. S. analysts now see the future, is Canada's oil industry—unless Canadian Arctic oil can be developed and transported cheaply enough to find a big market in Europe. The price problem makes this doubtful, in the opinion of some experts.

Canadians are currently exploring for oil in their own Arctic islands and near the mouth of the Mackenzie River, not far across the border from Alaska.

A number of other Canadian oil finds are shut in—nonproducing—because of lack of transportation or lack of markets.

Oil men in Canada have been pushing for a pipeline running from Prudhoe Bay diagonally across Canada to Chicago. Their proposal would have given U. S. companies free transit in return for letting Canadian producers use the line for sending their crude petroleum to market in the U. S.

Now it appears that such a pipeline is a long way off.

In fact, say the experts, even Canada's present exports to the U. S. may be in trouble. Canada currently sells about 500,000 barrels of oil a day to the U. S. at the American price of $3 a barrel and imports some 600,000 barrels a day at the world price of around $1.50 a barrel. Thus, it is argued, the U. S. consumer subsidizes Canadian companies.

Floods of Alaskan oil also are likely to increase demands from owners of high-cost wells in older producing States for lower oil imports from Canada and elsewhere. That promises headaches for President Nixon: How to keep oil men in the U. S. and governments in Canada and Venezuela happy.

Officials in Washington believe the outcome will be stepped-up consideration of a U. S.-Canadian continental oil policy. This presumably would mean free access for Canadian oil to lucrative U. S. markets. But it probably would also mean a requirement that Canada agree to limit imports of cheap foreign oil, it is reported in Washington.

Boost for shipbuilders. Analysts are discovering, too, that the benefits of Alaskan oil seem sure to spread well beyond the oil industry. To the shipbuilding industry, for one.

New tankers will have to be built to carry the large amounts of oil coming out of the Alaskan pipeline to refineries in the "lower 48" States. Federal law requires that all trade between U. S. ports be carried in American-made and manned ships.

No orders have been announced yet, but industry sources understand several 200,000-ton tankers are soon to be built, the largest ever made in the U. S. A possible step in that direction is a new project by Bethlehem Steel Company's Sparrows Point shipyard to construct facilities for 200,000-ton ships.

In San Francisco, Bethlehem also is building big new dry docks capable of holding a supertanker for repair.

Northwest Passage? Alaskan oil could finally accomplish what Henry Hudson and other explorers couldn't—the opening of the fabled Northwest Passage.

A Jersey Standard tanker, the *Manhattan*, is being fitted with a new type of ice-breaking prow for a try this spring at sailing from the Atlantic Coast, across the top of Canada to Prudhoe Bay.

The bow, named the "MIT bow" after the Massachusetts Institute of Technology where it was developed in co-operation with the U. S. Coast Guard, lifts the ship onto the ice, where sheer weight causes it to break through. This leaves a channel behind the lead ship for a train of smaller tankers to follow.

The Canadians are experimenting with still another type of icebreaker, the "Alexbow," named after inventor Scott Alexander. It splits the ice from below and throws it aside.

If the new icebreakers work, they would open the heavily populated Northeastern U. S. to supplies of Alaskan oil. But don't look for a completion of the Northwest Passage all the way into the Pacific Ocean soon, say the experts. Thickness of ice around the northwestern tip of Alaska runs 50 feet or more, far too much for today's icebreakers to tackle.

If ice does block the tankers, it will be one of the few hitches in Alaskan oil's remaking of the industrial and transportation map of North America.

30 THE WALL STREET JOURNAL, Friday, May 2, 1969

DEFENDANT'S EXHIBIT 165

Petroleum Prize

Oil Firms at North Slope Race for Data As Giant Lease Sale Bidding Approaches

By Robin W. Winsley
Staff Reporter of The Wall Street Journal

PRUDHOE BAY, Alaska — A giant poker game is under way on this frozen Arctic desert as oil companies prepare for what many veteran editors are betting will be the first $1 billion lease sale in the industry's history.

They're racing in tightest secrecy to gain vital information they'll need to bid in mid-September on up to 700,000 acres of state leases on Alaska's North Slope and under the Arctic Ocean near what's likely to prove the biggest oil field in North America.

To probe for those data through 1,500-foot deep permafrost (a mixture of permanently frozen ice, sand and gravel), 14 oil companies have assembled 28 towering drilling rigs on the Slope, with at least three more on the way. To support their frantic drilling activity, they've already moved, mainly by air, more than 50 million pounds of equipment and supplies into this area, about 1,200 miles from the North Pole. And they've built an amazing complex of ice fields, base camps, supply dumps and all-weather roads atop bordering five-foot-deep layers of gravel over about a 100-mile expanse of barren plain.

Those companies and unannointed others who don't have rigs or acreage on the Slope have dozens of "oil scouts" shuttling for clues as to what the others are finding. Some companies have purged armed guards at their drill sites, and at least two have cleared out all contractor personnel before making well tests. Reports are sent by courier, and radio references to wells are coded. Big crews even try to shield their operations from scouts in planes and helicopters.

Wrinkles at the Airport

With security as tight on the Slope, many scouts are posted 300 miles to the south in Fairbanks, where they watch supplies being loaded aboard long fleets of cargo planes around-the-clock at the Fairbanks airport, and observe airline customers and hotels to see what personnel are heading for the Slope. If a company ships a certain size of "casing" (heavy steel pipe used to seal off liquids from a hole) or a "Christmas tree", (the assembly of valves and fittings used to control oil or gas flow from a well), or a certain well services specialist arrives in town, it can be a valuable clue to what's happening at a rival's drillsite.

"All exploratory wells on the Slope right now are simply being plotted where they can best evaluate inbound acreage and provide as much information as possible for next fall's lease sale," Theodore F. Bradshaw, president of Atlantic Richfield Co., says in New York. "This means the tightest security, and we hope our security is as tight as anyone's," he adds.

It was a series of announcements last year by Atlantic Richfield that touched off the excitement here. They reported that an evaluation of data from two oil discovery wells on acreage held jointly by Atlantic Richfield and Humble Oil & Refining Co., chief domestic subsidiary of Standard Oil Co. (New Jersey) gives the "reasonable expectation" further drilling will prove up an oil field containing 5 billion to 10 billion barrels of crude oil.

Magnitude of Reserves

The latter figure would be more than one-fourth of known oil and gas liquids reserves in the rest of the U.S. and as much oil as Saudi Arabia has produced to date. It also would exceed the six-billion-barrel East Texas Field, currently North America's biggest, which nearly wrapped the industry with a flood of oil in the initial years after its discovery in 1930.

"Everything drilled by everybody on the Slope will be tight as a drum until September," says Harry Warman, Alaska operations manager for British Petroleum Co., the only other company to commit publicly it has made an oil discovery on the North Slope, and second only to Atlantic Richfield in total drilling activity here.

A green "Christmas tree" (the assembly of pipes and valves in the only kind of tree on the Slope) sits atop BP's Put River No. 1 well, but the company steadfastly declines to disclose any test data from the well, or to comment on reports it's testing another possible discovery at its Put River 33-11-13, five miles to the west.

Alan Cuthbertson, BP's 37-year-old drilling superintendent, who came to the frigid Arctic from steamy Abu Dhabi on the Persian Gulf, does concede, however, that "it's likely" Put River No. 1 found the same oil formation as did the Atlantic Richfield-Humble Prudhoe Bay No. 1, three miles to the north, and the Atlantic Richfield-Humble Sag River No. 1, three miles to the southeast.

Both tests released are Standard Oil Co. of California and Mobil Oil Corp. (operator for a joint venture with Phillips Petroleum Co.). The word all over the Slope is that each of the two has completed an oil discovery well, but both companies decline to confirm or deny the reports. Perhaps significantly, BP is drilling a well just 1,350 feet north of California-Mobil's rumored discovery, about six miles south of Put River No. 1, and is preparing another rig site just 1,350 feet northeast of the Humble well. There's also a rumor that Atlantic Richfield-Humble have a third discovery well six miles east of their Sag River well.

Pan American Petroleum Corp., exploration

and production subsidiary of Standard Oil Co. (Indiana), also has reported discovery of natural gas about 40 miles southeast of Prudhoe Bay, but both Pan American and other companies here decline to evaluate the significance of that find.

OIL FIRMS AT NORTH SLOPE RACE FOR DATA AS GIANT LEASE SALE BIDDING APPROACHES
(Continued)

More Valuable Than Money

Under Alaska law, oil companies can keep well data secret for up to 25 months. They must file reports with the state within a month of a well's completion, but this information can be kept confidential for up to two years. As an extra precaution, the state has locked the North Slope reports in a bank vault in Anchorage. Johns the Alaskan operations engineer for one major oil company, "I wish my talents included opening bank vaults—they could keep the money; I'd just like a peek at those reports."

The Securities and Exchange Commission has also clamped a lid on announcements about reserves and probable production from rules until more wells are drilling on the Slope. But high-level sources report the North Slope wells are "Middle East type" and are likely to produce at rates "of about 5,000 barrels a day."

One indication of the confidence of the oil companies in the amount and likely profitability of North Slope oil are joint plans to build a $900 million, 800-mile pipeline across Alaska to a warm-water port in the south. "This line will definitely be built, and we'll start as soon as we get needed clearances from the Federal Government," reports Atlantic Richfield's Mr. Bradshaw. A formal application to the Bureau of Land Management, which must clear the valuable rights over Federal land, is being prepared, he adds.

Mr. Bradshaw says the planned 48-inch diameter Trans-Alaska pipeline could carry up to 2 million barrels of oil daily with appropriate pumping stations and storage capacity. It will handle 500,000 to 700,000 barrels of daily output as scheduled completion in early 1972, but will be expanded as northern develop, he reports.

Atlantic Richfield estimates that California alone will have a 600,000-barrel-a-day crude oil deficit by early 1972, he adds. He asserts that other companies have asked to join Atlantic-Richfield, Humble and British Petroleum in building the common carrier line, but he declines to identify them.

"We expect to get this oil into West Coast markets by 1972," he reports, "and our calculations show that it will be able to compete very favorably with other domestic crudes." This will likely involve another $1 billion investment if a pipeline is used, regardless of whether it's a transcontinental line from the West Coast to existing systems in the eastern part of the country, or a line down Canada's MacKenzie River valley, he says. Ice-breaking tankers, another option, would be a lower-cost method of moving the oil to the East Coast, he adds.

Possible Sales in Escape

Humble Oil has eased the giant 115,000-ton tanker S.S. Manhattan into five parts and has three ships-its hauling up its hull with an ice-breaking bow, its hull and protection for the rudder and screws.

In June, the hulks, owned by Seatrain Lines Inc., will start for Prudhoe Bay to test the Northwest Passage through the Arctic Islands. If it's successful, ice breakings, ranging up to 250,000 tons and costing up to $40 million are likely to be built. "We'd like to get some North Slope oil directly into Western Europe, if ice-breaking tankers prove feasible," reports Michael L. Haider, chairman of Jersey Standard. To prepare for loading tankers at Prudhoe Bay, scientists of the University of Alaska are spraying water (which instantly freezes) on kept ice islands about 20 miles into the Arctic Ocean, hoping to add enough weight so they'll permanently ground on the ocean bottom to serve as mooring terminals.

Temperatures on the Slope last winter dropped to as low as 70 below zero and winds hit hurricane force of 100 miles an hour, pushing engines and equipment with such heat power that had to be shipped out by land. The sun stayed below the horizon for four months, causing a high turnover on the 12-hour day, seven-day-week, four-to-six-week work stints on the Slope.

By contrast, the sun will shine three straight months this summer, with temperatures reaching 100 degrees above, turning the Slope into vast lakes and rivers and stirring up clouds of mosquitoes.

"We expect North Slope oil to be more profitable than that from the Middle East, despite much higher production and transportation costs," asserts BP's Mr. Wertzen, a veteran of Middle East operations that have provided his company with about one-fifth of the Free World's known crude oil reserves.

North Slope production costs may range as high as $1 to $1.20 a barrel, compared with only 15 cents to 20 cents a barrel in the Middle East, he estimates. He notes, for example, that North Slope oil comes up at about 180 degrees Fahrenheit, and that some means will have to be found to cool it so that it won't melt the permafrost. Drillers report they've already having troubles with steel pipe and collapsed casing in the permafrost even when they use chilled "mud" (a chemical mixture) or air to cool the drilling bit.

BP reports its drilling costs are running $9 million for a well on the North Slope, and Atlantic Richfield says the "Beaufort No. 2" dry hole it drilled on its first bid on the Slope cost $4.5 million. Most companies expect most of wells to develop the Prudhoe Bay field will be much more modest. However, it's estimated that oil companies will have up to $300 million invested on the Slope by year-end—BP is spending about $6 million a month and says that may double by year-end.

Cost of transporting North Slope oil to the West Coast by pipeline and U.S.-flag tanker will likely be about $1.10 a barrel, indicating a wellhead price of about $1.80 a barrel for the medium-grade crude in the Prudhoe Bay field. That compares with about $1.60 to $1.80 for comparable Middle East grades, and Middle East governments take more than half the profit from oil output there, while U.S. crude production carries a 27½% depletion allowance on the gross that can eliminate taxes on up to half of net income.

A production rate of 600,000 barrels a day and a wellhead price of $1.80 a barrel would mean the North Slope would produce an annual income of about $400 million, or about $800 million in gross taken out of the Klondike in the entire history.

Resolution of Acreage

Oil companies have until June 25 to consolidate acreage they'd like to bid on next September. Peter Denton, chief of the mineral section of the state's division of Lands, says only those tracts "receiving the most significant interest" will go on the block.

But the sale is likely to be only the beginning. The state has claimed title to millions of acres south of Prudhoe Bay under the statehood act. Pending legislation in Congress would validate Native and Indian claims and end a freeze on transfer of Federal land to the state. Mr. Denton says the state then plans to offer this land for competitive bids. Then, he relates, will breathless noncompetitive claims that have been filed on the same land with the Federal Government, a move some disgruntled Alaskans plan to oppose.

The state bill would permit the Federal Government to open to bid the vast 23-million-acre Naval Petroleum Reserve No. 4, which borders the present exploration area on the [illegible] shores that had been sold earlier.

Despite the profit-taking yesterday, gains on the New York Stock Exchange managed to show a moderate lead over Tuesday's, with 716 issues up and 541 down of the close.

Big Board Volume Down

Volume on the Big Board slowed to 31,320,000 shares from 38,320,000 Wednesday, which was the highest since Dec. 29 and among the busiest sessions in the exchange's history.

Institutions, which accounted for a good part of Wednesday's activity, were less active yesterday. Trades of 10,000 shares or more, a measure of their dealings, totaled 76, down from the near-record level of 110 the previous day.

Jersey Standard Unit to Send Oil Tanker Through Northwest Passage in Test Run

By Jonn D. Williams
Staff Reporter of The Wall Street Journal

NEW YORK—In mid-July, as part of a $60 million gamble, a big oil tanker will start a voyage from Philadelphia via a polar route north of Canada to the North Slope of Alaska at Prudhoe Bay. And then it is to come back.

Humble Oil & Refining Co., at Houston, a subsidiary of Standard Oil Co. (New Jersey), is hoping the test will prove the feasibility of moving oil year-round from the new Alaskan fields to the East Coast of the U.S.

The SS Manhattan, specially fitted as an icebreaker, is scheduled to bull its way through the ice floes of the famous Northwest Passage on a 30-day roundtrip. T. J. Pinto, general manager of Humble's marine department, said if the experiment is successful, the company will honor it by October or, the earliest. If the results are negative, "we'll leave faster than that," he said. The odds are long, he conceded. For example, the Manhattan's twin propellers may fail in the ice.

But the payoff will be high if it works. Jack F. Bennett, general manager of Humble's supply department, estimated that moving the Alaskan oil by sea to the East Coast would be 40 cents a barrel cheaper than via a transcontinental pipeline.

Humble decided on the venture last December. In mid-January it contracted to charter the 115,000-ton Manhattan—the largest U.S.-flag tanker—from Seatrain Lines Inc. for two years at a total charge of about $10 million. Humble may renew the charter and has an option to buy the 940-foot-long vessel.

The past winter the Manhattan was sliced into four sections, three of which were towed to shipyards for modifications at Mobile, Ala., Newport News, Va., and Bath, Maine. A new bow with two-inch-thick steel plates has been built to help slice through the ice. Other sections have a special 1¼-inch-thick steel belt to ward off the pressure of ice on the vessel's sides.

The various modification tests will bring the ante to about $60 million.

The powerful 43,000-horsepower Manhattan is currently being outfitted at a Chester, Pa., shipyard and will be etched out early next month before starting the 4,500-mile voyage. This is half the distance it would take to go to Alaska via the Panama Canal. In any event, the Manhattan—now 1,005 long, or 65 feet longer than prior to her refitting—is too large for that canal's locks. And her new weight is 130,000 tons, 9,000 more than before.

If the gamble pays off, Humble plans to build six ice breaker tankers, each of 250,000-ton size, for a total cost of $900 million, Charles F. Jones, Humble's president, told a press conference here. This would be more than twice the cost if the tankers were built in Japan. U.S. law requires that vessels serving U.S. intercoastal ports be owned by U.S. labor and built in U.S. shipyards.

Mr. Jones speculates that if Humble's attempt proves itself other U.S. oil concerns would build up to 20 new tankers by 1980, enlarging the current U.S.-flag oil tanker capacity by 2½ times.

Humble officials made it clear how much of a gamble the project is. M. A. Wright, Humble's chairman, said that Atlantic Richfield Co. and BP Oil Co. have elected to take "a piece of the action at 25 million each," as they join the Northwest Passage experiment. Mr. Jones, the president, said, "We're willing for a seven on this cast (of the dice) and not for a point."

Alaskan oil production from the North Slope area is expected to begin in the early 1970s at a time when oil flow will begin to decline in the lower 48 states. By 1980, Humble officials predict, the total flow from the Alaskan area will be about two million barrels a day—equal to the current consumption in all of New England, New York and New Jersey.

Should the polar sea route test fail, Humble officials said they would consider pumping the oil across Canada and the U.S. via a new pipeline.

Humble, Atlantic Richfield and BP Oil have already decided to build an 800-mile, $900 million pipeline from the North Slope to the southern coast of Alaska. Pipe has been ordered for delivery starting in August; completion is slated for early 1972. Crude oil coming down via this line will be shipped to Hawaii and West Coast markets.

The Manhattan will carry two helicopters on her deck. These planes will fly ahead of the vessel to test ice conditions and help choose the most favorable route. Two U.S. Coast Guard vessels will accompany the Manhattan to lend assistance, if needed.

DEFENDANT'S EXHIBIT 166

THE WALL STREET JOURNAL
Page 5
June 4, 1969

DEFENDANT'S EXHIBIT 167

32 THE WALL STREET JOURNAL, Thursday, July 24, 1969

Three Oil Companies to Study Feasibility Of Building First Coast-to-Coast Pipeline

By a WALL STREET JOURNAL *Staff Reporter*

NEW YORK—Three major companies exploring for oil on Alaska's Arctic North Slope announced they'll make a feasibility study of building the nation's first coast-to-coast oil pipeline.

The study will consider construction of a large-diameter crude oil pipeline from the Puget Sound area of Washington to the Eastern Seaboard, by way of Chicago, they said. It would be about 2,600 miles long.

The project was announced jointly by Atlantic Richfield Co.; BP Oil Corp., U.S. operations subsidiary of British Petroleum Co.; and Humble Pipe Line Co., a subsidiary of Standard Oil Co., (New Jersey).

Likely cost wasn't disclosed. But in an interview earlier this year, Thornton F. Bradshaw, president of Atlantic Richfield, estimated such a line would probably cost over $1 billion.

The three companies are already planning to build a $900 million, 48-inch diameter crude oil pipeline from the North Slope to the warm water Alaskan port of Valdez. From there, oil would be shipped to the U.S. West Coast by tanker.

The U.S. transcontinental line is only one of three methods being considered for moving Alaskan oil to the eastern U.S. Humble is also planning next month to send an ice-breaking tanker from Philadelphia through the "Northwest Passage" to Alaska to test feasibility of that method of supplying the East Coast. And several companies are also studying the feasibility of a crude oil pipeline through Canada from the North Slope.

DEFENDANT'S EXHIBIT 168

Northern Natural Gas Plans Major Canada Pipeline

Cost of System to Transport Canadian Gas to the U.S. Put at About $1.4 Billion

Government Approval Needed

By a WALL STREET JOURNAL Staff Reporter

OMAHA, Neb.—Northern Natural Gas Co. is going to build a major pipeline system in Canada at a cost of about $1.4 billion to transport Canadian gas to the U.S., W. A. Strauss, chairman and president, said.

The total cost, to be spread over a five-year period, will be met in part by "major" participations of Canadian companies, he added. The cost to Northern Natural wasn't disclosed. A spokesman said that required governmental approval for the project was being sought.

However, Mr. Strauss said that plans call for construction of two "large diameter" pipelines from the producing areas in Alberta and the Northwest Territories to Northern's distribution system in Minnesota. The distance from the Minnesota pipelines to the province of Alberta is about 600 miles and about 1,700 miles to the Northwest Territories.

To implement plans for participating in the development of Canadian natural gas, Mr. Strauss said, Northern Natural has acquired a majority stock interest in Consolidated Pipe Lines Co., Calgary, Alberta. Terms of the purchase, made from a group of investors, weren't disclosed.

"Organized in 1955, but existing at present only as a "paper" company, consolidated Pipe Lines has the right to construct and operate pipelines in Canada, subject to government approval.

In recent years, considerable oil and gas exploration activity has taken place in Canada's Northwest Territories with many major oil companies participating in the search for additional reserves.

Currently, Northern Natural Gas is adopting advance payments and other incentives to develop natural-gas reserves for export to the U.S., Mr. Strauss said. He added that "negotiations are currently in progress with a number of producers and we are optimistic that similar reserves will be dedicated within the next few weeks."

The current program represents Northern Natural's second effort to import Canadian gas. In 1960, the company sought Federal Power Commission approval of a plan to bring Canadian gas into the system. However, the Federal agency turned down that application in favor of a similar proposal made by Great Lakes Pipeline Co.

That decision was appealed to the courts and subsequently remanded to the FPC for further hearings, scheduled to be resumed June 10 before a commission examiner.

Northern Natural Gas operates in the Midwest with its principal distribution lines in Minnesota, Iowa and Wisconsin. Gas supplies are obtained from Southwest producing areas.

THE WALL STREET JOURNAL, Tuesday, April 1, 1969

DEFENDANT'S EXHIBIT 169

THE WALL STREET JOURNAL
Page 2
June 18, 1969

Peoples Gas Unit Plans To Buy Midwest Area's First Gas From Canada

WSJ, p. 2, 6/18/69

By a WALL STREET JOURNAL *Staff Reporter*

CHICAGO — Natural Gas Pipeline Co. of America, subsidiary of Peoples Gas Co., plans to purchase 155 million cubic feet of Canadian gas daily beginning Nov. 1, 1970, George P. Garver, Natural Gas Pipeline president, said.

If approved by the various regulatory agencies, the arrangement will mark the initial entrance of Canadian gas into the Midwest market. Heretofore the area has relied on domestic gas produced in the South and Southwest.

The gas will be purchased from Great Lakes Gas Transmission Co., which is supplied by Trans-Canada Pipe Lines Ltd., Toronto. Price of the gas wasn't disclosed.

To minimize Natural's capital investment, the company has arranged to deliver the additional gas to the Chicago area by using facilities of Michigan Wisconsin Pipe Line Co. Michigan Wisconsin will accept deliveries of gas from Great Lakes Transmission and then, in turn, make an equal amount of gas available in Chicago to Natural Gas Pipeline.

DEFENDANT'S EXHIBIT 170

WALL STREET JOURNAL
Page 12
December 17, 1969

Alberta Agency Backs Northern Natural On Bid to Export Gas to U.S. Midwest

By a WALL STREET JOURNAL Staff Reporter

CALGARY—The Alberta Oil and Gas Conservation Board has decided to allow Northern Natural Gas Co. of Omaha to export 1.886 trillion cubic feet of natural gas from the province to the U.S.

The decision, subject to approval by Alberta's provincial cabinet, will allow export of the gas during a 20-year period, beginning Jan. 1, 1971.

Northern Natural, through its Canadian affiliate, Consolidated Natural Gas Ltd., Calgary, plans to export the gas to customers in the U.S. Midwest through an 800-mile pipeline. The pipeline is to be built by Consolidated Natural from Empress, Alberta, to North Branch, Minn., at an estimated cost of $280 million.

The gas-export plan also is subject to federal approval by Canada and the U.S.

Consolidated Natural had asked that it be allowed to export about 2.3 trillion cubic feet of gas during a 20-year period and, at hearings held by the Alberta agency last summer, the company's bid was opposed by Trans-Canada Pipe Lines Ltd., which argued that there wasn't enough gas in the province to support another pipeline.

Earlier this month, Trans-Canada received Alberta's approval to export another 2.3 trillion cubic feet of gas during the next 25 years, bringing Trans-Canada's total to 21.4 trillion cubic feet over a period extending to Oct. 31, 1994.

Trans-Canada plans to begin moving its additional gas to the U.S. Midwest by Nov. 1, 1970, subject to approval of the Canadian and U.S. governments.

Yesterday, in announcing its decision, the Alberta agency said it had considered Trans-Canada's opposition but that it didn't believe "that the public interest would be adversely affected by the project" of Consolidated Natural.

The board also said that it took into account the "assessment of reserves, the gas-purchase contracts and the manner in which the gas pools will likely be produced."

The proposed source of Consolidated Natural's gas is the Strachan-Rickman-Phoenix area and the Kaybob South Beaver Hill Lake Formation A pool. Both are in west-central Alberta.

The Alberta board said it was "satisfied that the reduced volume of 1.886 trillion cubic feet of gas is surplus to the present and future needs of the province and the existing permanent commitments."

DEFENDANT'S EXHIBIT 171

24 THE WALL STREET JOURNAL, Friday, December 15, 1967

Consumers Power Announces Plans For Atomic Plant

Dow Chemical Will Be Chief Customer of New Facility; Cost Put at $267 Million

Completion Is Slated in 1975

By a WALL STREET JOURNAL Staff Reporter

MIDLAND, Mich.—Consumers Power Co. said it plans to build a $267 million dual-purpose nuclear power generating plant here. Its chief customer would be Dow Chemical Co.

The facility, due to be completed in 1975, will be capable of generating 1.2 million kilowatts and 4 million pounds of steam per hour, with two nuclear reactors.

James H. Campbell, Consumers Power president, said the company has signed a long-term contract with Dow to provide all of Dow's electrical power needs from the new facility and also to provide Dow with the 4 million pounds of steam per hour for its heating and industrial needs.

Dow currently owns and operates its own coal-fired power and steam generating station, which will be closed when the nuclear plant goes into operation. Dow uses vast amounts of electric power to electrolyse brine in its chemical processes, and uses steam to evaporate brine solutions to obtain certain chemicals.

Terms Aren't Given

Neither company would disclose terms of the Dow contract, although Carl A. Gerstacker, Dow chairman, said the power and steam contract with Consumers Power is "the largest contract Dow has ever signed, either buying or selling." It was learned Dow will use about 300,000 kilowatts of the nuclear plant's 1.3 million-kilowatt capacity, with the rest of the power going into a Michigan power pool of which Consumers Power and Detroit Edison Co. are principal members.

The nuclear plant will be entirely owned and operated by Consumers Power, Mr. Campbell said. He said the company will need some type of outside financing for the project, but he declined to say what that financing might be.

Consumers Power recently disclosed plans to build a $188 million pumped-storage plant near Ludington, Mich.

Power for Ludington Plant

It is expected that excess power from the nuclear plant in low-demand time periods will be used to power equipment at the Ludington facility.

Mr. Campbell said the plant will be among the world's first privately owned, dual-purpose nuclear power generating plants. The plant here will be one of the largest yet constructed in terms of electrical output, he added.

He indicated the project wouldn't have been feasible without the contract with Dow.

Consumers Power said the Midland plant's two reactors will be of the type already in use elsewhere and won't represent any innovation in that field. Consumers Power already operates one nuclear plant and has another under construction. The building of the facility here will be subject to Atomic Energy Commission approval, the company said.

THE WALL STREET JOURNAL
Page 10
March 20, 1969

DEFENDANT'S EXHIBIT 172

Jersey Standard Joins List of Companies To Make Nuclear Fuel

Subsidiary to Build Plant in 1970 In Washington State; Research Assigned to Battelle Institute

By a WALL STREET JOURNAL Staff Reporter

NEW YORK—Standard Oil Co. (New Jersey) joined the growing parade of private companies planning to manufacture fuel elements for nuclear reactors.

A subsidiary, Jersey Enterprises Inc., said it will build in 1970 in the Richland-Pasco-Kennewick area of Washington State facilities for development and fabrication of nuclear fuels.

Jersey Enterprises also engaged Battelle-Northwest Institute, the Richland, Wash., branch of Battelle Memorial Institute, to carry out nuclear fuel research and development prior to building the facilities. Richland is the site of the Atomic Energy Commission's Hanford Laboratories. Battelle is a nonprofit research and development organization headquartered in Columbus, Ohio.

Jersey Standard becomes the third oil company to announce nuclear fuel plans. The others are Continental Oil Co. and Kerr-McGee Corp. The project would be the ninth such private venture, involving a total of 11 companies. Nuclear fuel elements were fabricated only by the AEC until a few years ago.

Jersey Standard announced earlier this month plans for the initial mining and processing of its uranium ore reserves in South Texas.

The Jersey Enterprises project will initially develop uranium and plutonium fuel elements for use in light-water nuclear reactors, the type used commercially by electric utilities. But it also expects to later develop elements or so-called "fast breeder" reactors. These reactors, still in the research stage, will operate at much higher efficiencies, and will produce new fuel faster than they consume other fuel. Jersey also will evaluate chemical reprocessing of nuclear fuel elements.

Jersey's initial outlays for nuclear fuels research will involve just $1.5 million. But in disclosing the plans, Sen. Jackson (D., Wash.) asserted the project is "the first step in a long-range program designed to enable Jersey Standard to become a significant factor in the production and distribution of nuclear fuels to utility plants."

DEFENDANT'S EXHIBIT 173

NUCLEONICS WEEK-January 15, 1970

IN 1970: 23 UTILITIES WILL ASK BIDS ON 29 NUCLEAR UNITS

If all the U.S. utilities who are planning to ask bids on nuclear power stations this year go nuclear all the way - or even halfway - 1970 could be a respectable year for the nuclear power business. Raymond Freeman, of General Electric's corporate headquarters in New York, told the New York City metropolitan area chapter of the American Nuclear Society this week that 23 utilities were planning to request bids on 29 nuclear units this year with a combined capacity of about 30,000 Mwe. Freeman was not predicting how many would order nuclear. Last year, orders were announced for seven units, totaling about 7,250.Mwe.

* * * * * * *

DEFENDANT'S EXHIBIT 174

CHICAGO TRIBUNE
Page 16
January 20, 1970

THE ANTI-ATOM NUTS

In a significant report in Sunday's Tribune, Ronald Kotulak, our science editor, called attention to an alarming increase of opposition to nuclear-powered electric generating plants. Government and utility officials predict a power crisis, with blackouts, brownouts, and electricity rationing, in the late 1970s unless it can be averted by an unprecedented expansion program. The only way to meet the country's growing needs for power, without polluting ourselves to death, is to construct generating plants fueled by atomic energy instead of coal, oil, or gas.

Paradoxically, there is strong opposition to nuclear-powered plants from misinformed or mischievous elements of the population who say they are against pollution. This newspaper has been in the forefront of the fight against pollution of our air and water, and we believe that much more vigorous efforts by government agencies at all levels are required to prevent further degradation of our environment. But the anti-pollution campaign, like many other worthy causes, attracts many well-intentioned but emotionally-disturbed people, as well as busybodies, nuts, and others who are in bad company when they're alone.

Some opponents of atomic energy are incited by subversives whose objective is to destroy the capitalist system. Others are against all technology, like the early 19th century followers of an idiot named Ned Ludd in England, who tried to stop the industrial revolution by smashing the machines.

A modern coal-fired generating plant with a capacity of 1 million kilowatts emits 250 tons of sulfur dioxide and 20 tons of nitrogen oxides each day. The burning of coal, oil, and natural gas adds 6 million tons of carbon dioxide and 1 million tons of carbon monoxide to the atmosphere each year. Atomic plants produce no air pollutants. There is no possibility of a nuclear explosion in one of these plants. A coal-fired plant emits more radioactive materials from its smokestack than a nuclear plant. The used fuel cores of nuclear plants are safely buried, in places where there is no danger of water pollution.

Nuclear plants do discharge water, used for cooling purposes, that is 20 per cent warmer than cooling water discharged by conventional plants. Dr. Glenn T. Seaborg, chairman of the Atomic Energy commission, says the effects of this warm water on fish and aquatic plants are not fully known but are under intensive study. He favors state water quality standards which would have to be met before the AEC would issue licenses.

It is fortunate for this area that the Commonwealth Edison company of Chicago pioneered private nuclear power at its Dresden Island plant, near Morris. It has six other giant nuclear plants nearing completion or under construction which will increase its generating capacity by more than 30 per cent to 32.3 million kilowatts in 1975. It will have the largest nuclear generating capacity in the country.

A constant expansion of electric power generating capacity is essential for the nation's economic growth, on which our standard of living depends. Even more than our standard of living—our survival—depends upon the use of atomic energy for power production. In these circumstances, the government must authorize additional plants when and where they are needed, no matter how much opposition there may be.

DEFENDANT'S EXHIBIT 175

WALL STREET JOURNAL
November 28, 1967

Consumers Power Announces Plans For New Plant

Pumped Storage Facility Set For 1973; Detroit Edison To Share Cost and Output

Outlay to Total $186 Million

By a WALL STREET JOURNAL Staff Reporter

JACKSON, Mich.—Consumers Power Co. said it plans to build a pumped storage hydroelectric plant near Ludington, Mich., on Lake Michigan at a cost of $186 million.

Detroit Edison Co. will pay about half the cost of the plant and will share proportionately in its generating capacity. But the plant will be wholly owned and operated by Consumers Power, according to James H. Campbell, Consumers Power president, and Walter L. Cisler, Detroit Edison chairman.

The plant, scheduled for initial use in 1973, will be capable of generating up to 1,872,000 kilowatts of power. This will make the facility the largest pumped storage hydroelectric plant in the U.S., Consumers Power said. Currently, there are 11 such plants operating in the U.S., and the largest is an 880,000-kilowatt facility in Pennsylvania, the utility said. In addition, there are seven projects under construction, and 46 more—some generating up to 3,000,000 kilowatts—are proposed or being considered, it said.

A pumped storage power plant differs from conventional hydroelectric plants in that it stores electric generating power in the form of water in a reservoir, the company said. In the Consumers Power plant, when water is released from a 27 billion-gallon reservoir the company will build, hydraulic turbines will spin the generators, making electricity. The same equipment will pump water to the reservoir from Lake Michigan by reversing the direction of rotation. Thus the generators become electric motors, driving the turbines as water pumps.

Mr. Campbell likened the water-storage type plant to "a giant storage battery" for quick use at a time of peak demand. "In off-peak hours, when customer demand is lowest—such as late at night or on weekends—water will be pumped from the lake and stored in the reservoir," he explained. "Then, at time of maximum demand, the water will be released, generating electricity on its way back to the lake."

"We'll be able to add significantly to our generating capacity; rapidly if necessary," he added.

DEFENDANT'S EXHIBIT 176

WALL STREET JOURNAL
Page 24
August 7, 1968

FPC Aide Again Approves Con Edison Bid To Build Power Project; Protests Likely

A Wall Street Journal Power Reporter

Consolidated Edison Co. won Federal approval for the second time for a bitterly opposed giant $660.5 million pumped storage hydroelectric project on the Hudson River near Cornwall, N.Y.

A Federal Power Commission examiner recommended that the New York City utility be permitted to proceed with the project. It has sought since Jan. 23, 1963. The FPC approved it March 6, 1965, but on Dec. 20, 1965 a U.S. Court of Appeals set aside the Federal license and ordered examination hearings.

Opponents have 30 days in which to protest the ruling, and it is considered likely they will do so. If no protests are filed, and the FPC doesn't order a review of the hearing, the decision could be final in 60 days.

Charles F. Luce, Con Edison chairman and chief executive officer, said if the license is issued for the Cornwall project, "our company can move ahead rapidly with several phases of our program to improve service to customers."

The project has been contested chiefly by conservation groups. Objections initially were aimed at charges that the plant would mar the beauty of historic Storm King Mountain at a scenic spot on the Hudson near West Point. But Con Edison agreed to put the plant and part of its power transmission lines underground. Opposition has since revolved chiefly on such points as potential damage to fish spawning areas.

FPC Examiner Irving C. Stenger rejected as "not persuasive" arguments that the Con Edison project would be harmful to marine life. He also rejected claims that Con Edison hadn't complied with the Federal Power Act's comprehensive planning requirements regarding development of the Cornwall area. The utility plans public parks both around the inland reservoir and along the new dredged river front near the plant.

Con Edison has estimated it would take about three years from start of construction to have the first hydroelectric turbine in operation, and about four years to have all eight turbines on the line. The project would be capable of generating 2 million kilowatts of power on peak, one of the largest pumped storage projects in the world.

Pumped-Storage Theory

The theory behind pumped storage is related to the great fluctuations in daily power use. A reservoir of considerable height above the power plant releases water through the plant's turbines to generate power at peak demand periods of the day. During hours of low power use, electricity from other plants is used to reverse the turbines and refill the reservoir with water from the river.

The reservoir for the Cornwall project would be located 1,320 feet above the Hudson in a 300-acre natural depression between Storm Mountain and Mount Misery, about one mile southwest of Storm King. It would be on the site of the municipal water reservoir for the town of Cornwall, and Con Edison would build a new water reservoir for the town.

Water would flow to the power plant through a 20,000-foot long, 40-foot diameter tunnel through the mountains. The plant would be placed in underground galleries hewed out of rock north of Storm King Mountain, on the Hudson's west bank, about 40 miles north of New York. Power lines would travel under the Hudson River and underground three-fourths of a mile on the east bank before surfacing for conventional overhead lines.

Examiner Stenger recommended an additional 3.9 miles of underground of power lines and some altering of the proposed route of overhead lines.

Con Edison asserts that the Cornwall plant would provide extensive protection against a massive power failure such as the great Northeast blackout of Nov. 9, 1965. It says that Cornwall's power could be started up within minutes to meet a sudden emergency.

Mr. Luce said, "The availability of Cornwall to provide a large supply of power at a moment's notice in case of emergency will strengthen the reliability of power supply for the entire Northeastern region of the U.S."

Cite Air Pollution

Delay of the Cornwall project has forced Con Edison to build a 200,000 kilowatt coal-fired plant on Staten Island it otherwise wouldn't have needed, and has prevented scheduled closure of parts of four obsolete coal-burning plants in Manhattan. This has hurt the company's efforts to cut costs and has hampered the city's efforts to reduce air pollution, Con Edison officials assert.

Cornwall will enable Con Edison "to reduce even further our share of the air pollution in the New York City area by shutting down older and less efficient coal and oil burning plants," Mr. Luce said.

The court ruling ordering reconsideration of the Cornwall project was considered significant because it forced the FPC to consider economic and conservation issues in granting licenses for power projects. But it also brought about changes from some in the power industry of excessive opposition by conservation interests being to the detriment of power users.

DEFENDANT'S EXHIBIT 177

WALL STREET JOURNAL
Page 7
January 19, 1970

TVA Plans to Start $155 Million Project At Raccoon Mountain

Plan Will Include 4 Reversible Pump-Turbine Units With Total Capacity of 1.4 Million Kilowatts

By a WALL STREET JOURNAL Staff Reporter

KNOXVILLE, Tenn.—The Tennessee Valley Authority said construction of its $155 million Raccoon Mountain pumped storage hydroelectric project near Chattanooga will begin in mid-1970.

Preliminary studies and investigations for the project have been under way for several years. The system uses power at off-peak hours to pump water to a reservoir where it is stored for making electricity when demand is heavy.

TVA said the project will include four reversible pump-turbine units with a total generating capacity of about 1.4 million kilowatts. The units are planned for an underground powerhouse to be carved out of rock inside the mountain.

The project will include a mountaintop reservoir covering about 800 acres with a tunnel some 30 feet in diameter to drop water from the reservoir to the powerhouse below and out to a nearby lake, TVA said.

The four units are scheduled for operation in 1974 and 1975. Construction will be financed with proceeds from the sale of TVA bonds and with revenue from power sales, TVA said.

TVA said its studies show that additional capacity required to meet system loads during 1974 and 1975 "could be provided at lower cost by the Raccoon Mountain project than with the alternative of steam-electric units."

DEFENDANT'S EXHIBIT 178

TIME MAGAZINE
Page 60
July 26, 1968

THE GEYSERS WITH FUMAROLES IN CALIFORNIA

Power from a leaky crust.

GEOPHYSICS

Percolators in the Earth

While chasing a grizzly bear one day in 1847, Explorer-Surveyor William Bell Elliott blundered into a canyon that looked to him like "the gates of Hell." Huge, spiraling columns of steam hissed out of the ground; the earth trembled beneath his feet. "The Geysers," as he named the hill-rimmed valley 85 miles north of San Francisco, is as awesome as ever. But its frightening bursts of steam are now being harnessed. The canyon is the site of the first commercial geothermal-power plant in the U.S., and the installation has paid off so handsomely in eight years of operation that it has set off a small "steam rush" in the Far West.

As old as the earth itself, natural steam is a familiar source of heat and power in countries as widely separated as Italy, Iceland and New Zealand. The renewed interest in the U.S. springs from a growing population's need for more electricity. In some areas, geothermal steam offers a cheap, ready-made alternative to coal, oil and nuclear fuels, and it leaves no pollutants in the air. At The Geysers, steam-driven turbines produce 58,000 kw. of electricity at a cost 23% below that of nearby conventional generating plants; in a few years, the area could be producing almost 20 times as much.

Prospecting for Steam. The largest and most accessible steam fields are located west of the Rockies, where volcanic activity has brought molten, lava-like rock known as magma close to the earth's surface. The 1,500° F. magma either releases its own trapped water as steam or, like a gigantic coffee percolator, vaporizes water that has seeped down into the earth.

Occasionally steam emerges through fissures in the ground called fumaroles (from the Latin word *fumariolum*, meaning smokehole), and the simplest way to prospect for this geothermal energy is to look for such vaporous leaks in the earth's crust. But in areas where the energy remains trapped underground, geologists must use more sophisticated techniques. One method employs infra-red aerial photography. Since the infra-red film is sensitive to heat, geothermal areas are likely to show up lighter in the picture. Another method measures the earth's electrical conductivity, which increases with the presence of subsurface hot water. To tap the subterranean energy, engineers drill with standard oil rigs, going down as little as 600 ft. or as much as 8,000 ft., the depth of the world's deepest steam well at Salton Sea near Brawley, Calif.

The Monster. The job can be dangerous as well as difficult. At The Geysers, a new well erupted with such furious force that the scalded workmen were convinced they had tapped a live volcano. To cool it off, they pumped in cold water until a nearby stream ran dry. Then they tried a concrete plug, without success. "The Monster," as they dubbed the well a decade ago, continues to spout.

Such unrestrained power holds enormous promise. Engineers estimate that by 1980, geothermal energy could be generating as much as 10% of the total electrical output of the U.S. And no matter how much is used, the heat is not likely to be used up. Once scientists master the technology, they should be able to recirculate condensed steam back into the ground, giving virtually unlimited life to wells in states as dry as Nevada. Even without such recirculation, Italy's 64-year-old Larderello geothermal-power plant near Siena, where fumaroles gave Dante earthly inspiration for his Inferno six centuries ago, is still going strong.

DEFENDANT'S EXHIBIT 179

CHICAGO DAILY NEWS
Page 45
January 9, 1969

This is Geothermal Resources Well No. 1 in Sonoma County, Calif. There's a steam rush today in the country that had a gold rush 120 years ago.

Earth's own power source

By Dean C. Miller
United Press International

If man succeeds in tapping and harnessing the giant steam boiler below the earth's crust he will have enough power to run his factories, heat and light his homes, and launch his space probes for centuries.

U.S. companies in recent months have decided to drill seriously for geothermal power locked in the earth's molten center.

The resultant "great steam rush," like the "great gold rush" 120 years ago, was centered west of the Rockies. The rigs are especially active at the geysers about 90 miles north of San Francisco, where Pacific Gas & Electric Co. has been producing electricity since 1960 from steam created by molten rock or magma under the earth's surface.

PG&E plans a 250,000,000 complex capable of generating 250,000 kilowatts, enough to "turn on" San Francisco.

Oil companies also are in the steam race. Occidental Petroleum, Sun Oil and Union Oil are prospecting.

Some scientists estimate 10 per cent of the U.S. electricity will come from such wells by 2000.

The potential is staggering. Power from steam wells will be virtually inexhaustible when a technology permitting recirculation of condensed steam back into the ground is refined.

LIKE NUCLEAR power, geothermal energy is being touted as the energy source of the future. And it has the added advantages of being cheap and non-polluting.

DEFENDANT'S EXHIBIT 180

WALL STREET JOURNAL
Page 19
June 23, 1969

Burning Refuse to Be Used In 'Total Energy' Concept

By a WALL STREET JOURNAL Staff Reporter

NEW YORK — Refuse collected from tenants will provide part of the fuel supplying all electricity, heat and air conditioning for two shopping centers to be built in Joplin, Mo. and Middletown, N.Y.

Two small New York companies announced plans for combining refuse disposal with the so-called "total energy" concept of supplying all energy needs with on-site plants.

Combustion Equipment Associates Inc., a maker of air and water pollution control devices, will design, manufacture and maintain a refuse collection and disposal system for the two projects. It said the system will be "pollution free."

Total Energy Leasing Corp., which owns and leases on-site total energy plants, will lease the refuse system for use in its total energy units at the two shopping centers.

Some European cities, Montreal and the U.S. Navy have constructed plants that generate steam by burning refuse. This steam, in turn, is used for generating electricity and for heating. The new projects, however, would carry the principle a bit further by combining it with the total energy approach.

INTERVENOR'S EXHIBIT 181

Excerpt from transcript of Hearings before the Joint Committee on Atomic Energy, 90th Congress, 2d Session, on Participation by Small Electrical Utilities in Nuclear Power. - (Part 1 - April 30-May 3, 1968).

(Reprinted from April 29, 1968 issue of Electrical World - Copyright 1968, McGraw-Hill, Inc. All rights reserved)

AFFILIATION IS FAST BECOMING A NECESSITY

Consolidation of power systems in the U.S. today is fast becoming a matter of economic necessity.

For the past five years economies of scale have steadily pointed to the merits of better coordinated operation and mutual location, timing, sizing, and ownership of system facilities among neighboring interconnected utilities. The industry has steadily moved in this direction.

Today the tempo has quickened. Impact of the mounting new capital requirements, soaring interest rates, sagging rates of return, and the touchy legalities of coordination for reliability are fast making corporate partners out of friendly neighbors.

The issue today is not so much *whether* to integrate contiguous systems as it is *how* and *when*. Affiliation is getting the nod more often than outright absorption of one company by the other. The reasons are plausible. Affiliation leaves corporate identities intact, minimizes personality and personnel conflicts, maintains local company identity, preserves prestige, and simplifies and accelerates the journey toward the coordinated planning and operation.

These affiliations all tend to optimize operating savings which in some instances, even among groups of limited size, can amount to upwards of $2 million a year. Common purchasing of stock items in carload lots can bring savings of 10-15% and substantial amounts on fuel purchases. Mutual standards offer economies by eliminating minor differences in specifications and settling on fewer types of materials and equipment.

In another area, operation of a mutual engineering and design department, research and development, the consolidation of heavy construction forces, sharing of testing departments, and the operation of mutual standardization and metering laboratories can bring further savings.

All of these considerations soften and can perhaps offset the declining rate of return created by mounting money rates and escalating costs of material and equipment in the face of expanding system needs to keep pace with mounting loads.

But as we see it, perhaps the most far-reaching and significant influence in the creation of affiliations is related to the legal and financial complexities involved in true coordination of power pools and interconnected systems to attain the ultimate in bulk power reliability. It is difficult in the extreme to conceive how agreement could be reached—short of affiliation—among members of a pool or interconnection where extensive reinforcement to the fringe area of a remote system is paramount to the reliability of a nearby metropolitan load center.

And so it is that we say that merger and affiliation of power systems today is no longer a comfortable convenient thing to do, but it is fast becoming a matter of industry necessity.

DEFENDANT'S EXHIBIT 182

New York Times
June 12, 1968

New England Affiliation Slated

Three Concerns Involved

The boards of the Boston Edison Company, Eastern Utilities Associates and the New England Electric System had approved a plan to combine under a single parent organization, the Eastern Electric Energy System, the companies announced yesterday, continuing the trend toward "affiliations" of utilities on a regional basis.

The new company would be a Massachusetts business trust with operating subsidiaries serving about 1.6 million electric and gas customers in 261 towns in parts of Massachusetts, New Hampshire and Rhode Island. The announcement was made jointly by Cleveland F. Anslie, chairman of Boston Edison; Guido R. Perera, president of Eastern Utilities; and William Weissner, chairman of New England Electric.

The three executives said the decision to unite followed an analysis of studies made over the last several months by both the individual companies and outside consultants. The studies indicated such a move would be "in the interest of shareholders and customers and

UTILITY CONCERNS PLAN AFFILIATION

Continued From Page 61

should produce benefits to the New England regional economy."

Under the terms of the agreement, stockholders of Boston Edison common would receive 1.85 shares of Eastern Electric Energy for each share held. Holders of Eastern Utilities would receive 1.134 shares of the new company's common stock for each share held after giving effect to its 2 for 1 stock split on last May 31 and owners of New England Electric common would receive one share of Eastern Electric Energy for each share held.

Year Needed for Approval

It is expected that at least one year would be required to obtain the necessary approvals of the Securities and Exchange Commission, the Federal Power Commission and the Massachusetts Department of Public Utilities.

Combined assets of the new company as of last Dec. 31 would have been in excess of $1.5-billion, making it the eighth largest power system in the nation. Total operating revenues would have been $487-million and net income would have been about $55-million. It would be the twelfth largest in country in kilowatt-hour sales and 12th in electrical

This latest affiliation of utilities continues to bear out the prediction of Donald C. Cook, president of the American Electric Power System, who said that the day is coming when there will be no more than a dozen or so utilities across the nation.

New England Network Seen

Utility observers also hailed upon yesterday's announcement as hastening the day of an all-New England utility network made up of Northeast Utilities, itself a relatively new holding company, and the new Eastern Electric Energy, plus various independent companies throughout the six-state area.

In fact, Northeast Utilities, New England Electric and Boston Edison went into lengthy preliminary investigations of a possible affiliation back in 1966. This would have produced a system with assets of more than $3-billion putting it into the top three in size in the industry at that time.

Northeast Utilities broke off negotiations on Jan. 31, 1967 and the three announced then the move "was not intended to bar eventual affiliation but was a temporary action to give Northeast an opportunity to complete internal adjustments arising from its earlier mergers."

DEFENDANT'S EXHIBIT 193

Boards of Iowa P&L And Iowa-Illinois G&E Approve Merger Plan

New Entity, Iowa Energy Corp., Plans to Retire the 2 Utilities' Outstanding Preferred Shares

By a WALL STREET JOURNAL Staff Reporter

DES MOINES, Iowa—Iowa Power & Light Co. and Iowa-Illinois Gas & Electric Co. said directors of both companies approved a plan to merge the concerns into a new corporation to be called Iowa Energy Corp. The merger previously had been approved in principle.

The consolidation plan provides that outstanding shares of preferred stock of the two companies will be retired by the new corporation at the rate of 8,000 shares annually. The preferred shares will be exchanged for Iowa Energy preferred shares on a share-for-share basis with equivalent dividend rates, redemption and liquidation prices and similar rights and preferences, the companies said.

Under terms previously announced, Iowa Energy and Iowa-Illinois common stock will be exchanged on a share-for-share basis, and 1.15 shares of Iowa Energy will be issued for each Iowa Power common share. Iowa Power has 3.2 million common shares outstanding, and Iowa-Illinois Gas has 5.1 million.

The two utilities entered into a memorandum of intent in September 1967 to combine under a holding company arrangement. They attempted to attract other gas and electric utilities in Iowa into joining the plan, but were unsuccessful. The two utilities said last month a merger was being explored as "a possible alternative to the holding company proposal."

DEFENDANT'S EXHIBIT 184

THE WALL STREET JOURNAL
Page 8
November 27, 1968

Ayrshire Collieries Asks Bids of 5 Firms

Coal Concern Invites Offers to Purchase or Merge With It; Replies Expected Next Month

By a WALL STREET JOURNAL Staff Reporter

INDIANAPOLIS—Ayrshire Collieries Corp. has invited five companies to submit either sale or merger proposals, according to a letter sent to stockholders.

The five companies weren't named. Plans for either the sale or merger of the coal company were disclosed early this year.

Proposals are expected to be received in December from all five companies, the letter said. But shareholders were told that because of the possibility that any negotiations or agreement will "involve complicated types of transactions," it may be two or three months before additional information can be supplied.

"Because of complications, we believe it's in the best interests of stockholders not to make any further announcement until a definite agreement has been reached for the sale or merger of the company," the letter stated.

Lovett C. Peters, former executive vice president of Cabot Corp., said, "It appears Ayrshire would be more valuable to others than to Ayrshire stockholders." Mr. Peters was hired last February to act as agent in any transaction.

Questioned as to the management's reasons for selling the company, Pierre F. Goodrich, chairman, said, "Proper action by directors includes not only management but also consideration of a sale or merger if it appeared to be in the stockholders' best interests." He declined further comment.

DEFENDANT'S EXHIBIT 185

THE WALL STREET JOURNAL
Page 34
January 22, 1969

Ashland Oil Plans To Buy or Lease Ayrshire Assets

Boards Vote Proposal That Includes the Sale of Coal Royalties to Third Firm

Pact Involves $125 Million

By a WALL STREET JOURNAL Staff Reporter

ASHLAND, Ky.—Ashland Oil & Refining Co. and Ayrshire Collieries Corp. said directors approved a proposal involving acquisition or lease of Ayrshire's assets by Ashland.

Ayrshire Collieries produces coal, with operations primarily in Illinois, Indiana and Western Kentucky. The company has substantial reserves west of the Mississippi River.

The announcement said Ayrshire would receive for its assets an aggregate of approximately $125 million, with at least $95 million to be derived from sale of reserved coal royalties. The balance of the sale price would be paid by Ashland in cash or common shares having the same market value.

Reserved coal royalties, including mining rights and related mining equipment, will be sold by Ayrshire to third parties, and thereafter operated under a lease providing for the payment of royalties on coal produced.

Such "production payments" are common in transactions involving large reserves of oil or minerals in the ground, and have been used in other recent acquisitions of coal companies. A spokesman for Ashland said a leasing arrangement is relatively new in the coal industry, but is common in the hard minerals industry.

The proposal contemplates that Ayrshire will pay from the proceeds of the sale approximately $19,625,000 principal amount of long-term debt of Ayrshire and its subsidiaries. On liquidation, Ayrshire shareholders are expected to receive, after payment of certain expenses and taxes related to the sale, cash or cash and [illegible] with an aggregate value of $30 a share.

Orin Atkins, president of Ashland, and Pierre F. Goodrich, chairman of Ayrshire, said the transaction is subject to completion of definitive agreements providing for the sale by Ayrshire of all of its assets, approval by Ayrshire shareholders, receipt of a tax ruling, and other necessary approvals.

Ayrshire in 1968 had sales of approximately $80 million. The company produces approximately nine million tons of coal annually.

Ashland Oil, which had 1968 sales of more than $1 billion, refines and markets petroleum products, petrochemicals and chemicals.

Mr. Atkins had told the Ashland annual meeting Monday that a number of other companies were also bidding for Ayrshire. He said the coal company had coal reserves of more than 2 billion tons.

Ayrshire is located in Indianapolis.

THE WALL STREET JOURNAL
Page 7
April 24, 1969

DEFENDANT'S EXHIBIT 186

Metal Climax, Ayrshire Sign Merger Accord

Acquisition of Coal Producer By Metals Firm Valued at Minimum of $62.6 Million

Boards and Holders to Vote

By a WALL STREET JOURNAL Staff Reporter

NEW YORK—American Metal Climax Inc. and Ayrshire Collieries Corp. said they signed a letter of intent "looking toward" the merger of Ayrshire into Metal Climax in a transaction currently valued at a minimum of $62.6 million.

The acquisition of Ayrshire, an Indianapolis-based coal producer, would mark Metal Climax's first move into the coal business. Metal Climax is a major producer, fabricator and marketer of metals and minerals, including molybdenum, potash, copper, lead, zinc, iron and aluminum.

Talks aimed at the acquisition of Ayrshire or the leasing of its assets to Ashland Oil & Refining Co., Ashland, Ky., were called off earlier this month. At that time, Ayrshire said it was holding discussions with another company, which it didn't identify.

Under terms of the Metal Climax-Ayrshire agreement, Ayrshire stockholders would receive one share of a new class of Metal Climax convertible preferred stock for each of the 7,027,000 Ayrshire common shares. The new Metal Climax preferred would have a dividend rate of $4 a share through 1971 and $5.25 a share thereafter. It would be convertible into the company's common stock on a formula based on the price of the common between now and May 31, within a convertibility range of 1¼ to 1 2-3 common shares for each preferred share.

On the basis of Metal Climax's closing price on the New York Stock Exchange yesterday of $62.75, up $1.125, the proposed transaction would have a minimum value of $62.6 million and a maximum value of $80.5 million.

The agreement is subject to ratification by directors and shareholders of both companies. It's contemplated that the transaction would be tax-free to Ayrshire holders.

Ayrshire mines coal in Indiana, Illinois and Kentucky, predominantly by the open-pit method. In the fiscal year ended June 30, 1968, the company earned $4.3 million, or $0.94 a share, on sales of $69.7 million; in the first half of fiscal 1969, the company earned $1.1 million, or $1.45 a share, on sales of $32.6 million.

Coal production from its nine mines is about nine million tons a year. Two new mines are under development and annual production is expected to increase to about 18 million tons by 1972. The coal is sold primarily to electric utilities.

Metal Climax earned $67.4 million, or $4.36 a share, in 1968 on sales of $970.5 million.

Last year, Kennecott Copper Corp., the largest U.S. copper producer and a major foreign copper producer, acquired Peabody Coal Co. in a diversification move.

Air pollution authorities urge use of "clean-burning" natural Gas.

DEFENDANT'S EXHIBIT 187

Today, more and more apartment building owners are turning to Gas heat. Things stay cleaner inside and out.

What you've read in newspapers, magazines and heard on television is true. Air pollution is fast becoming more of a threat than ever. Like most of our major cities, Chicago is facing a big problem.

Polluted air is dangerous. It isn't something one person can suddenly stop. It's the concern of all of us. And more and more apartment building owners are turning to natural Gas. You see, natural Gas burns cleaner. That's why natural Gas is now recognized as a good way to help keep city air cleaner. And air pollution authorities are saying as much in other large urban centers.

If you own an apartment building, it makes good sense to consider clean-burning natural Gas. Gas makes good money sense too, because Gas is economical. Your tenants will be happier too, because natural Gas helps to keep apartments clean. And with natural Gas, you can be sure you will be doing your part for a cleaner Chicago. Like a fresh idea? This one lets you breathe a little easier.

THE PEOPLES GAS LIGHT AND COKE COMPANY

CHICAGO SUN TIMES 5/16/67

Gas does the big jobs better for less!

1109

DEFENDANT'S EXHIBIT 186

1977 THE YEAR OUR CITY DIED.

If the increasing pollution of our air is not reversed, Philadelphians might have to move. Or both adults and children will gasp for fresh air and get sick with dangerous respiratory ailments.

Could this nightmare come true? Yes. The special air pollution report to New York City's mayor warns that this could happen to major cities—including Philadelphia—within 7-10 years. Unless prompt action is taken to bring air pollution under control.

Just a few weeks ago an air pollution alert sounded in Philadelphia. Fortunately, a change in the weather broke up the inversion before pollution reached dangerous levels. But next week or next month, we may not be so lucky.

One important step to reduce air pollution is for industry to change to fuel that does not contain sulfur. A fuel like natural gas, a non-pollutant. And PGW has encouraged this change by reducing gas rates to large users twice in recent months. For facts on big-volume gas rates, or to explore the advantages of using gas, write direct to us. Or call 796-4273.

PHILADELPHIA GAS WORKS

PHILADELPHIA INQUIRER 12/4/67

EXHIBIT
189

You can heat 2½ houses with modern oil for what it costs to heat 1 house with electricity!

No doubt about it. Just take your oil bill for last winter. Multiply by 2½. That's about what electric heat would cost. Let's say your oil bill was $200. Then, electric heat would cost about $500. You pay $300 more every year. Over a 20-year mortgage your oil savings of $300 a year could add up to over $10,000*. It's easy to see what a fortune you save with oil heat!

You save in other benefits, too. No fuel is cleaner than oil. (Take an electric clock off the wall. Look at the smudge.) No fuel is more powerful. (Oil heats water 5 times faster than electricity.) No fuel is safer. (With oil — no red hot wires all over the house.) Individual room temperatures? You can have that with any fuel. But what for? It means running around changing seven or eight thermostats all the time and keeping doors closed between rooms! Who needs it?

Why pay so much more and get so much less? Stay with modern oil heat and count your blessings. Count your money, too!

*Compounded at 5%

OILHEAT
YOU CAN DEPEND ON IT

LOCAL CHAPTER NAME AND ADDRESS

1171

We're helping Main Street switch to nuclear power.

Nearly half of recent generating capacity commitments are nuclear. Worthington, a leader in many phases of conventional power generation, is directly involved in the switch.

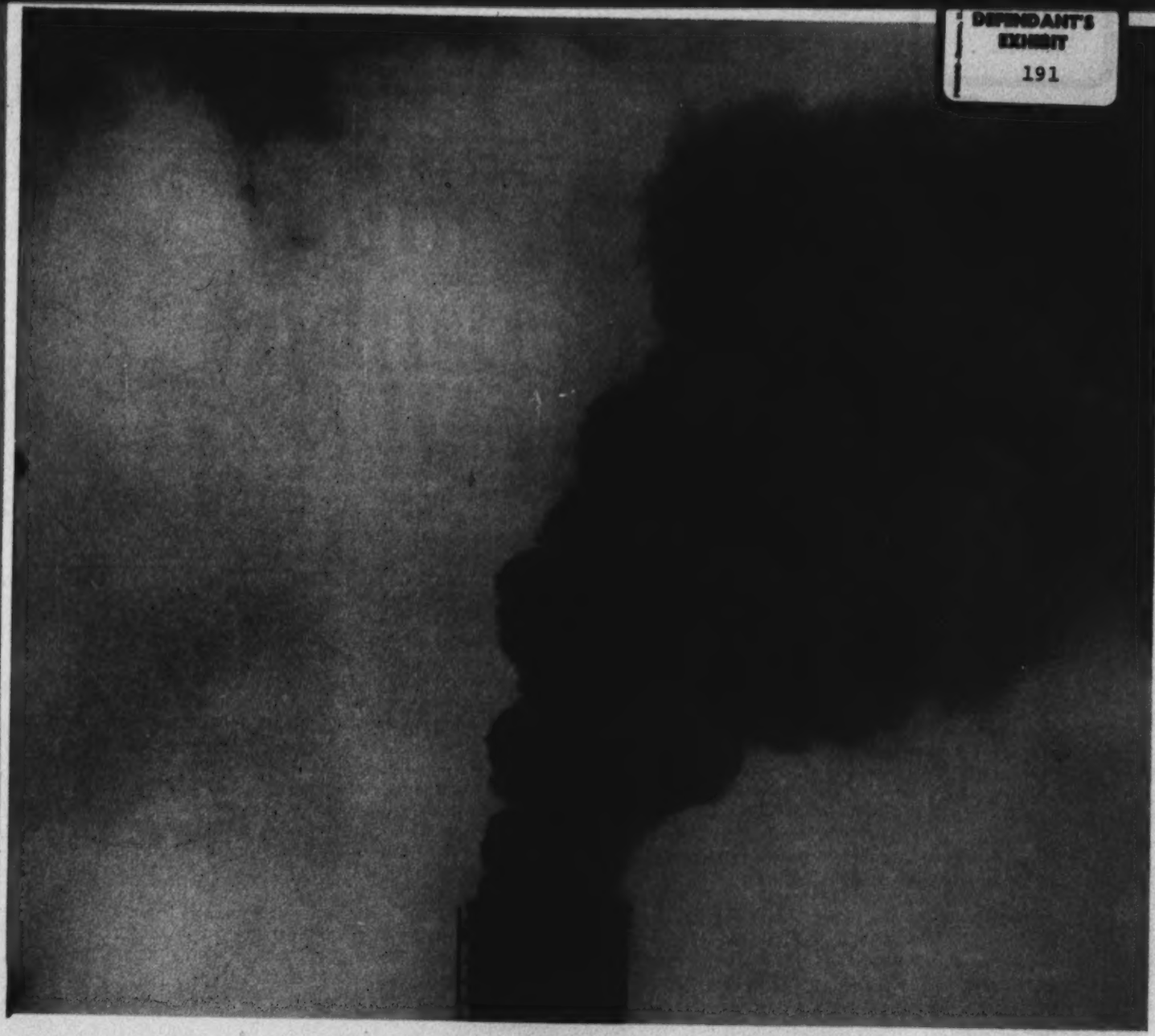
Our jet gas turbines and diesel engines can supply the energy to start up nuclear plants. Our control valves, boiler feed pumps, motors and feedwater heaters are in plants under construction. And we've shipped the largest twin-shell, multi-pressure nuclear steam condenser.

In fossil fuel plants, we've shown the way with many developments in major steam plant auxiliaries. And we have many innovations in our complete turbine, diesel and jet gas turbine generating units used for base load, peaking or emergency standby.

Helping generate power for industry and people is one of many ways Worthington helps serve man's basic needs: for energy, food, water, transportation, and health and sanitation.

WORTHINGTON
SERVING MAN'S BASIC NEEDS WORLDWIDE

DEFENDANT'S EXHIBIT 191



This pollution was caused by burning money.

How much of it was yours?

Where there's smoke, there's incomplete combustion. When it comes from a boiler plant, someone has paid for fuel that didn't burn. What doesn't burn gives no heat. Someone's money has gone up the chimney in smoke. Which makes not only bad air, but very bad economics.

What makes *good* economics is to put in a modern Todd burner with the sonic fuel atomizer—as replacement for older burners (coal or oil), or in new construction. Combustion efficiency with sonic atomization: 98% and often higher. It keeps your chimney smokeless, even with residual fuel oil.

Using sonic energy to boost boiler performance is the first really new development in fuel atomization in 50 years. It is also a Todd exclusive.

Be selfish. Fight air pollution. Have your engineering department write Todd today for design information. Department F., 120 Park Avenue, New York, N.Y. 10017.

TODD PRODUCTS

DIVISION OF TODD SHIPYARDS CORPORATION

Gas- and oil-burning equipment for commercial, industrial and marine application

1178

DEFENDANT'S EXHIBIT 192

What's Gas Energy doing to make industry nice to be near?

This industrial chimney is in full-time operation. Where's the smoke? There isn't any because it's using clean-burning Gas Energy.

Gas Energy is helping to get rid of plant waste before it becomes a community air pollution problem. By using economical Gas for waste incineration and heat processing, more and more plants are contributing to clean air in their communities.

But Gas incineration is more than good public relations, it's good business. Because Gas cuts operating costs for processing and waste disposal. And high temperature incineration is effective because Gas burns clean. And without odor.

Modern Gas incineration can dispose of liquid, gaseous, and solid wastes. And heat from incineration can be recovered for industrial processing. Or for plant climate control.

The problem of air pollution is receiving public and legislative attention. So industry must solve its diverse and complex problems of gaseous, liquid, and solid waste disposal. And research in the Gas Industry is playing an important role in solving these problems.

But is this really so surprising? After all Gas is almost pure energy.

AMERICAN GAS ASSOCIATION, INC.

1174

DEFENDANT'S EXHIBIT 193

How nuclear science may give America more Gas energy.

It happened in December, 1967. With a muffled boom from the release of energy equivalent to 26,000 tons of TNT. A nuclear explosion that was part of Project Gasbuggy. It was an experiment designed to put nuclear explosives to work on their first peaceful, industrial application.

The explosion took place 4,240 feet underground. Its purpose was to heavily fracture the Gas-bearing rock in a remote area of New Mexico. That way, more Gas could move through the rock and to a wellbore.

With conventional explosives, estimated recovery of Gas at the Gasbuggy site would be about 10%. But a nuclear explosive, by vastly increasing escape space in Gas-bearing rock, was expected to increase recovery to an estimated 70%.

Working with the Atomic Energy Commission and Department of Interior, the Gas Industry is planning for the future. There is great optimism that this and other experiments will make it possible for America to have more energy for better living tomorrow.

But is this all really so surprising? After all, Gas is almost pure energy.

AMERICAN GAS ASSOCIATION, INC.

G111

DEFENDANT'S EXHIBIT 194

BOILER CONVERSION?

Get the 5 advantages Gas power-type burners give you in full measure.

Here they are: efficiency, safety, durability, economy, and cleanliness.

You see, Gas power burners work by forced injection of primary and secondary air. This provides perfect control of combustion, regardless of variable chimney drafts. No high chimney or induced draft fan is needed. Just a short vent stack, properly sized.

That's efficiency and economy. So is the way Gas burners come completely assembled for quick and easy installation. Safety? Factory-tested Midco Lo-Blast power burners, for example, come with dual-type constant safety pilots as the standard control system. And other safety systems are also available.

Cleanliness? Nothing burns cleaner than Gas. Or more economically. Gas burners are durable. No replacement worries.

Midco converts an apartment and the service staff is cut by 2/3.

When the University of Chicago bought a hotel for residential use, one of the first steps was conversion to Midco Lo-Blast burners. Instead of three full-time engineers plus two relief men, the 10-story building's heating system is now serviced by one man. And the Midco 6,000,000 BTU/hr burner operates so automatically that 95% of his time is available for other duties. Also reduced: noise and dirt.

Are you converting? Better get details on Midco burners from your local Gas Company Sales Engineer. Or write: Mid-Continent Metal Products Co., 2717 North Greenview Ave., Chicago, Ill. 60614.

AMERICAN GAS ASSOCIATION, INC.
For commercial heating... Gas makes the big difference.

AG-76819—This advertisement appears in Actual Specifying Engineer, March; American School Board Journal, March; American School & University, March; Consulting Engineer, May; Plant Engineering, May; Domestic Engineering, June, 1968.

KETCHUM, MACLEOD & GROVE, INC.

THIS IS A PAR ACTIVITY

Who offers you 24-hour plant site location service on the 60-mile Illinois Shore?

Peoples Gas, of course.

DEFENDANT'S EXHIBIT 195

Look to the Illinois Shore for your new plant site. From Indiana to the Wisconsin state line and west are more than five hundred square miles of industry-rich land called the Illinois Shore. If you're looking for a new company home, it's smart to take advantage of the free 24-hour plant site location service we offer.

In a day or sooner, you'll have all the vital facts. Peoples Gas will put charts, maps, data-processed site and building information at your fingertips. Everything you'll want to know. And experienced personnel will work with you.

Discover the prosperous Illinois Shore. Call or write The Peoples Gas Light and Coke Company, 122 S. Michigan Avenue, Chicago, Illinois 60603; ask for the Area Development Manager. Phone Area Code 312—431-4888.

THE PEOPLES GAS LIGHT AND COKE COMPANY
AND
NORTH SHORE GAS COMPANY

1177

DEFENDANT'S EXHIBIT 196

the not-so-brief case

for complete chicagoland plant site information

Call Jack Cornelius at Peoples Gas, and he will bring it to your door—tomorrow!!

How do you briefly discuss something as important as a new plant site location? Chances are you don't—not if you want all the facts.

That's why you should rely upon the complete relocation service that a Peoples Gas representative can give you. Because our staff is expert in many fields—real estate, transportation, labor, financing and more—they are uniquely equipped to answer all your questions. Thoroughly. As they apply to *you*.

We know Chicagoland's Illinois Shore area like no one else. From the Wisconsin border to Indiana and all 500 square miles of industry-rich land in between. Whether you seek an urban, suburban or rural environment, we can find just the site to fit your particular needs.

And thanks to our automated selection of plant site information, our staff can pull together loads of information and personally answer your immediate questions immediately, *within 24 hours of your call.*

So go ahead—dial 312—431-4888 collect and ask for Area Development Manager, Jack Cornelius. You pick up the phone—he picks up his case.

THE PEOPLES GAS LIGHT AND COKE COMPANY
122 S. Michigan Avenue • Chicago, Illinois 60603

THE PEOPLES GAS LIGHT AND COKE COMPANY AND NORTH SHORE GAS COMPANY

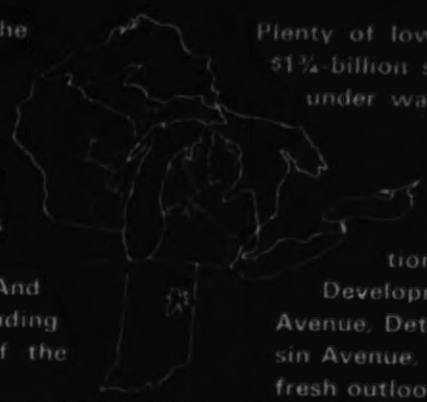
1178

DEFENDANT'S EXHIBIT 197

The perfect salt substitute.

The sparkling, fresh waters of the North Coast. More than half the nation's supply. So pure, you can often use them "as is" for industry. And they lead directly to the sea. From many ports closer to Europe than New York and Baltimore.

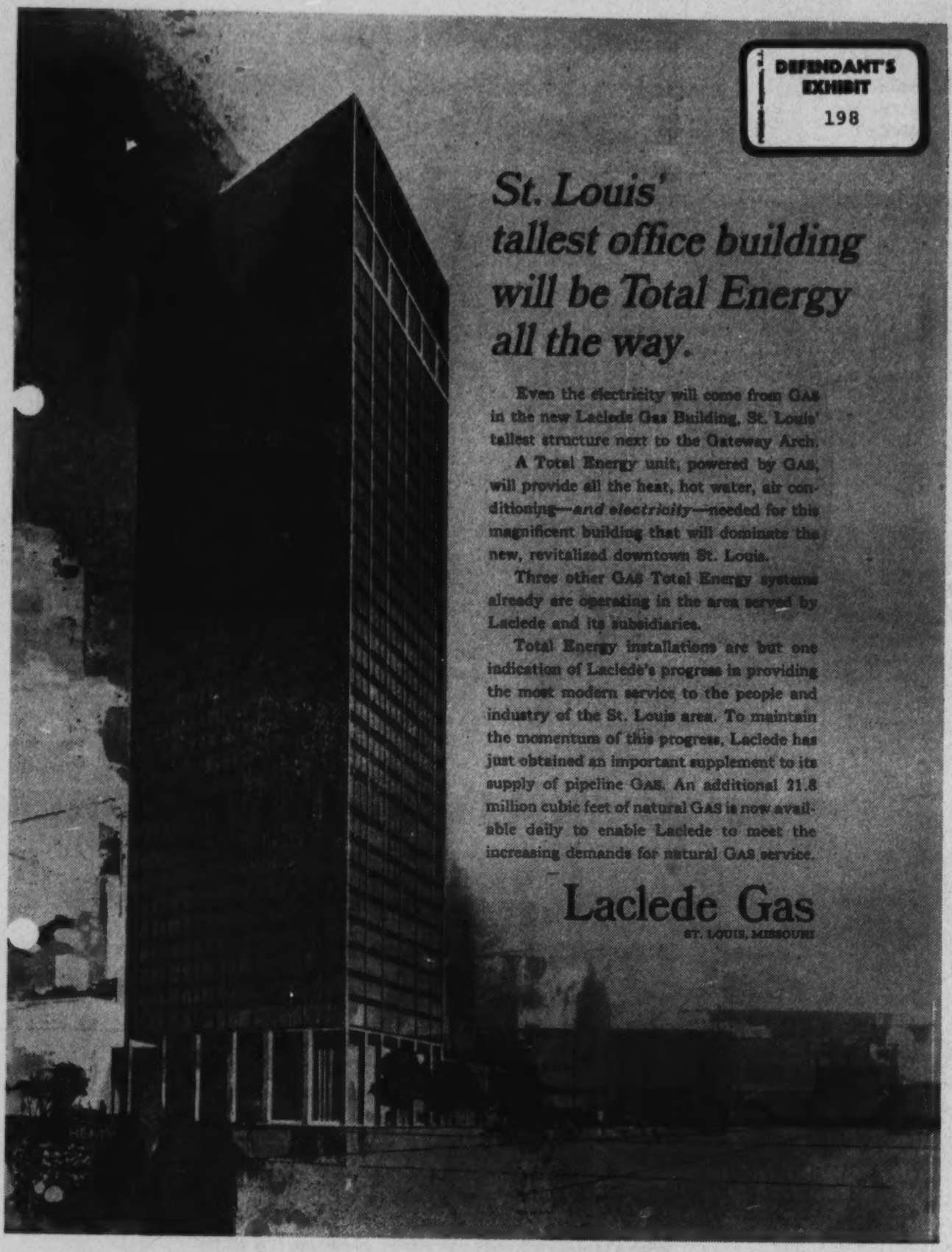
Great natural resources, too. And plenty of undeveloped land. Including more shoreline than either of the other coasts.



Plenty of low-cost natural gas, as well. A $1¼-billion system, with a vast expansion under way. The kind that helped boost Michigan and Wisconsin industrial output more than 60% since 1960. With Indiana now adding a major contribution. Want more details? Write: Area Development Division, One Woodward Avenue, Detroit 48226, or 626 East Wisconsin Avenue, Milwaukee 53201. You'll get a fresh outlook.

AMERICAN NATURAL GAS COMPANY

Michigan Consolidated Gas Company • Central Indiana Gas Company
Wisconsin Gas Company • Michigan Wisconsin Pipe Line Company



DEFENDANT'S EXHIBIT 198

St. Louis' tallest office building will be Total Energy all the way.

Even the electricity will come from GAS in the new Laclede Gas Building, St. Louis' tallest structure next to the Gateway Arch.

A Total Energy unit, powered by GAS, will provide all the heat, hot water, air conditioning—*and electricity*—needed for this magnificent building that will dominate the new, revitalized downtown St. Louis.

Three other GAS Total Energy systems already are operating in the area served by Laclede and its subsidiaries.

Total Energy installations are but one indication of Laclede's progress in providing the most modern service to the people and industry of the St. Louis area. To maintain the momentum of this progress, Laclede has just obtained an important supplement to its supply of pipeline GAS. An additional 21.8 million cubic feet of natural GAS is now available daily to enable Laclede to meet the increasing demands for natural GAS service.

Laclede Gas

ST. LOUIS, MISSOURI

The Savings and Loan that saves with natural Gas.

Blue Island Savings and Loan in Illinois had a problem. They weren't getting their money's worth from their air conditioning system. The fuel bills were too high and the cooling was inadequate. But that all changed when they changed to Gas.

Gas air conditioning is quiet and efficient. And does a small tonnage job economically. The three units in this system effectively provide customer areas, offices, and vault with 21 tons of cooling air. For only 39 cents an hour. And there's a saving on maintenance too. Because low tonnage Gas air conditioners are constructed for durability.

Management at Blue Island was so pleased with the cooling performance of Gas, they decided to use it for heating too. Isn't it time you decided to use Gas cooling and heating? It's the perfect solution for people who know the value of a dollar.

For any kind of installation, large or small, find out why Gas does the best job. Call your local Gas Company Sales Engineer.

AMERICAN GAS ASSOCIATION, INC.

For heating and cooling,
Gas makes the big difference.

AG-77736—This advertisement appears in U.S. News & World Report, November 18; Chain Store Age, November, 1968.
KETCHUM, MACLEOD & GROVE, INC.

THIS IS A PAR ACTIVITY

Pretty soon you may be making your own electricity from natural gas.

Every light in the house and more than a dozen appliances operating at the same time... *most* of the time.

How'd you like to pay this electric bill?

A few years from now you just might not mind at all. Because you might not have an "electric bill". You, and the owner of this home, may be able to produce all the electricity you need with a "fuel cell" powered by natural gas. The same natural gas that saves you so much money on heating, cooling and cooking today.

The gas fuel cell makes electricity chemically. Natural gas is piped in. It takes a safe chemical bath... and comes out electricity! Enough electricity for lights, TV, stereo, kitchen appliances, power tools and all the little labor-saving, luxury-living gadgets that are here today or on their way.

When can you order yours? Not just yet... but maybe sooner than you think. We have a working model of the gas fuel cell now. And yours could be ready before long. If you have natural gas, you're all set. For you, we're going to make electricity as economical and dependable as natural gas.

There's a lot more coming from natural gas energy.

Northern Illinois Gas Company

1183

DEFENDANT'S EXHIBIT 201

What do you call it?

No matter what you call it,

there's a lot more coming from natural gas energy...

...there's a lot more coming from natural gas energy.

Gas energy...natural gas energy...that gas energy that warms and cools your home, dries your clothes and cooks your food...is going to do a lot more for you in the future. One day soon, for instance, gas energy may generate all the electricity you need right in your home... for a lot less than it's costing you now. Gas energy may bring you fresher water to drink... and cleaner air to breathe. Gas energy may get you to work faster in the morning, home sooner at night, or across the country faster than you can get across town today. And guess what's coming to dinner...natural gas turned into food! So stay tuned. There's a lot more coming from natural gas energy. And, beginning next month, we're going to tell you all about it.

"Who said that?"

Northern Illinois Gas Company

R4

Another shopping center finds that making it's own electricity is the best buy.

Waukesha Gas Energy Systems produce electricity for lighting, heating and cooling.

Building a big shopping center can easily give you some big headaches. Especially when you begin thinking of utility costs for lighting, heating and cooling.

That's why the owners of Turfland Mall in Lexington, Kentucky, chose a Waukesha Gas Total Energy system.

How does a Gas Total Energy System work? Gas-fired Waukesha Enginators** provide all of the electricity the shopping center needs. In the process, huge amounts of engine heat are produced. But this heat doesn't go to waste. Because in a Gas Total Energy system it's recovered and used. For heating, cooling, and hot water. **Waukesha's factory-tested family of engine-generators.

This thermal efficiency is the reason a Gas Total Energy system is so economical. In fact, installations of this kind can be more than twice as efficient as today's best steam electric generating stations.

And with a Waukesha Gas Total Energy system, area power failures are not a problem. Because all the power is dependably produced on the site. Not from a distant source.

So even if the lights go out for everyone else, this shopping center and its customers are never affected.

Economical Gas Total Energy systems are working in schools, buildings, shopping centers, and plants around the country. Can it work for you? Find out from your Waukesha representative. Or the local Gas Company Sales Engineer. There's no reason why you can't get in on a good buy, too. • AMERICAN GAS ASSOCIATION, INC.

For all your energy needs, Gas makes the big difference.

AG-14983—This advertisement appears in Buildings, January; Heating, Piping and Air Conditioning, February; Architectural Record, [illegible]

Sheraton-O'Hare reduces utility costs over 50%.

Waukesha Gas Engines produce electricity, cooling and heating.

Suburban Chicago's Sheraton-O'Hare made a drastic cut in utility costs by going to Gas Total Energy. But economy was only one reason why this major hotel stopped buying electricity. The memory was still vivid of the 72-hour electrical service break caused by a 1965 ice storm. So they also wanted the dependability and security of a Total Energy System.

Four Waukesha Gas-fuel engines are at the heart of the system. The Waukesha engines drive electrical generators. Two of them handle the daily utility load. Two others stand by for emergency and for future expansion. (Including a planned convention center.)

What makes a Gas *Total* Energy System? The heat of the engines is recovered and put to work for absorption cooling, heating and hot water.

This unique combination of economy, efficiency and reliability is why so many commercial buildings are choosing Gas Total Energy.

Learn more about what Gas Total Energy can mean to you. Consult with your Waukesha distributor or contact your local Gas Company Sales Engineer.

AMERICAN GAS ASSOCIATION, INC.

Gas makes the big difference.

AG-76915—This advertisement appears in Business Week, March 30, 1968.
KETCHUM, MacLEOD & GROVE, Inc.

THIS IS A PAR ACTIVITY.

Shoppers buy all year 'round in an ideal dimate created with Gas Total Energy.

The comfortable climate of all 62 stores and connecting malls is an important reason for the popularity of Dixie Square Shopping Center in Harvey, Illinois. Everything is under one roof, climate-conditioned with economical and reliable Gas Total Energy. And each store is equipped with a system that lets the tenant regulate the temperature.

But Gas Total Energy does more than cool and heat. In fact, it can meet just about any energy need you can think of.

At the heart of this Gas Total Energy system are six natural Gas-fueled engines. In the process of generating electricity, a considerable amount of heat is a by-product. The efficient recovery of this heat for climate control and industrial Gas processes is an important reason why Total Energy can be so economical. (Installations of this kind can be more than twice as efficient as today's best steam electric generating stations.)

Gas Total Energy could be the ideal way for you to create an ideal environment. It's the dependable, economical and clean way to total comfort 365 days a year. For more information, get in touch with your local Gas Company Sales Engineer.

AMERICAN GAS ASSOCIATION, INC.

For all your energy needs, Gas makes the big difference.

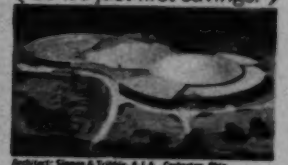
AG-7685C—This advertisement appears in Chain Store Age, July; Power, June, 1968.

KETCHUM, MACLEOD & GROVE, Inc.

THIS IS A PAR ACTIVITY

School Board chooses Gas heat over electric and saves over $50,000.

(That's just on first costs. So it's just first savings.)



Architect: Elgner & Tribbie, A.I.A., Columbus, Ohio
Engineer: Ballard & Assoc., Canton, Ohio
Gen. Contractor: Columbus Roofing & Insulating Co., Columbus, Ohio

The School Board of Ridgewood High in West Lafayette, Ohio got Gas and electric heat bids from independent contractors.

Here's what they found: Electric came in at $2.59 per square foot for the 60,000 square foot school. The Gas bid was only $1.95. The difference adds up to a big $38,200.

Another first-cost savings came from the $15,000 that the school didn't have to spend on heavier wiring and the sophisticated controls needed with electric heat.

But the savings from Gas heat go on. Because the operating economy of Gas goes on for as long as you use it.

This school is no isolated case. There are many other studies that have proved the value of competitive bids when you want the best heating value.

So if you're looking for a heating system for a school or any other installation, take a good look at Gas heat. Just call your local Gas Company.

AMERICAN GAS ASSOCIATION, INC.

For school heating, Gas makes the big difference.

This new school uses Gas Energy for heating, cooling and electric power and saves $1,000 a month.

When the architects designed Catholic Central High School in Greater Muskegon, Michigan, they chose a Gas Total Energy system. The result has been savings estimated at $6,300 on power and heat generation in just six months.

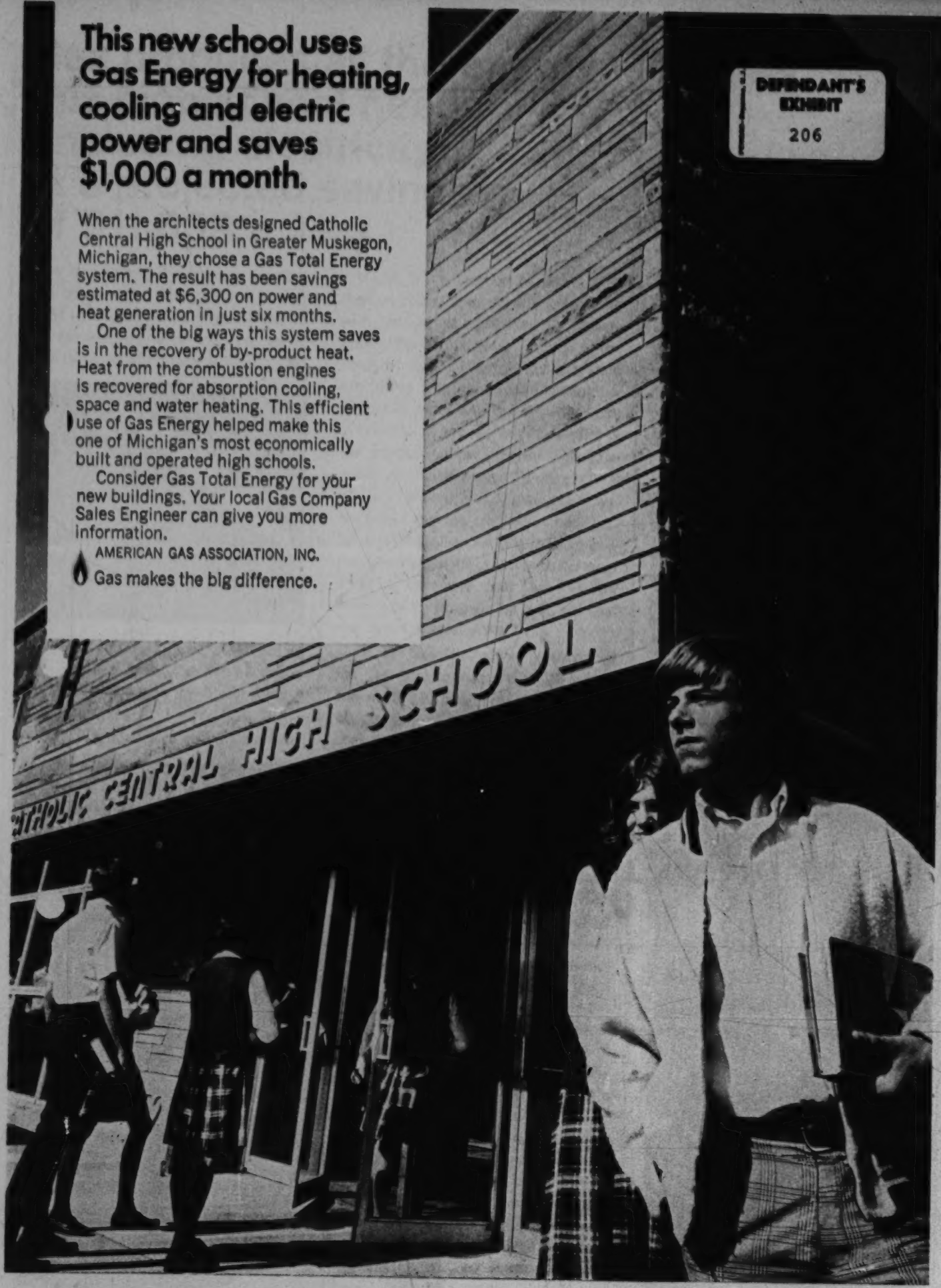
One of the big ways this system saves is in the recovery of by-product heat. Heat from the combustion engines is recovered for absorption cooling, space and water heating. This efficient use of Gas Energy helped make this one of Michigan's most economically built and operated high schools.

Consider Gas Total Energy for your new buildings. Your local Gas Company Sales Engineer can give you more information.

AMERICAN GAS ASSOCIATION, INC.

Gas makes the big difference.

DEFENDANT'S EXHIBIT 206



AG-77451—This advertisement appears in Actual Specifying Engineer, August; Architectural Record, August; American School & University, September; Domestic Engineering, September; Nation's Schools, September; Catholic Market, September/October; Business Week, October 5; Education News, October 7; Progressive Architecture, October; U. S. News & World Report, October 7; American School Board Journal, November; College Management, November; Nation's Schools (Board Members' Edition), November; Catholic Building & Maintenance, November/December; College & University Business, December; Heating, Piping & Air Conditioning, December; School Management, December, 1968.

THIS IS A PAR ACTIVITY

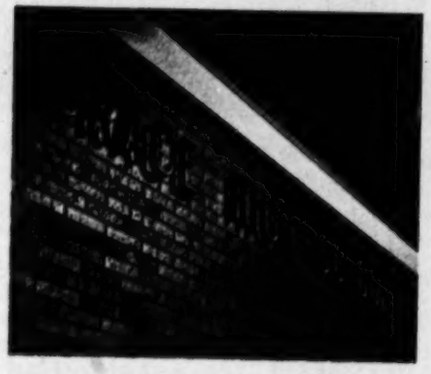
KETCHUM, MACLEOD & GROVE, INC.

1191

DEFENDANT'S EXHIBIT
207

Gas produces all the energy this high school needs (including electricity) at a projected savings of $11,639 a year.*

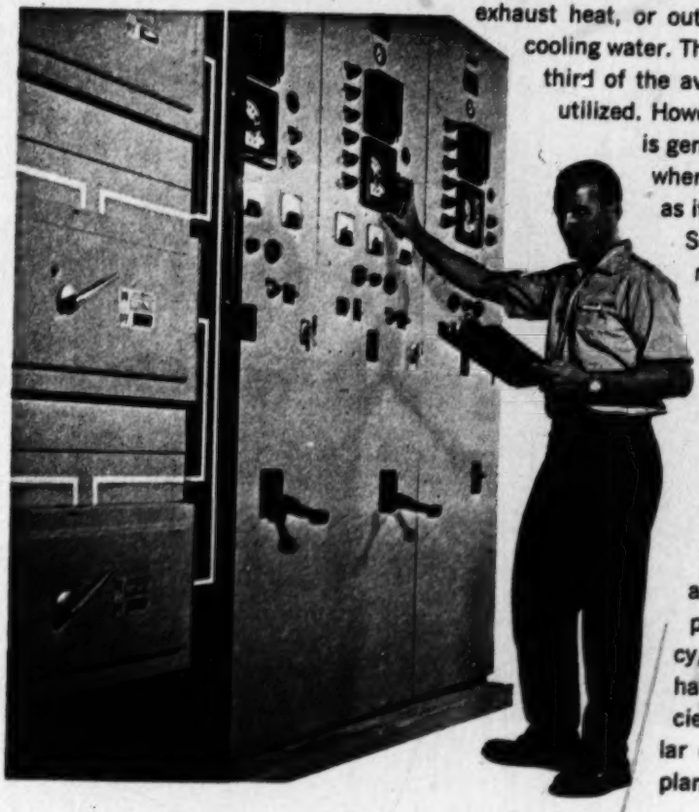
Hard to believe? It's true. In its first year of operation, the gas total energy plant in use at Grace High School in the Minneapolis area is expected to save the institution over $11,600. And



the reliability has been outstanding, too. Students haven't missed a single day of classes due to power failure of any sort.

But, just what is a gas total energy system? It's a method of power production based upon on-site generation with natural gas provided by Minneapolis Gas Company as the fuel. At the heart of Grace High School's system are three gas reciprocating engine-generator sets, any two of which can provide all of the electricity needed in the school. (Approximately 350 kilowatts per hour peak load during school hours.) Exhaust and engine-jacket water heat from the engines is captured by a 110-ton absorption unit and a heat exchanger to produce the energy used to heat and cool the 151,000 square-foot complex, as well as heat the domestic hot water.

Herein lies the economy secret of the gas total energy system. In a central electrical power plant, more than 60 per cent of the fuel's potential energy is wasted—up the stack with the exhaust heat, or out with the engine cooling water. Therefore, only one third of the available energy is utilized. However, when power is generated at the site where it is to be used, as it is at Grace High School, the energy not converted into electricity is captured to meet the operation's thermal needs: heating and cooling. Grace High School's total energy system operates at approximately 80 per cent efficiency, or two-and-one-half times the efficiency of the regular electrical power plant.



1192

What does this increased efficiency mean to Grace High School? Simple: Money.

*Projected Purchased Powsr Costs, School Year, 1966-67 (Gas and Electricity)	$26,391.00
*Projected Total Energy Operating Costs, 1966-67 (Including Maintenance Overhaul Allowance)	14,752.00
Total Operating Savings, 1966-67	$11,639.00

In addition to the $11,600 in projected operating savings this year, the school realized an additional savings in that they didn't need to purchase expensive standby power equipment. Furthermore, the system also made it possible to enclose the building substantially, thereby eliminating perimeter walls and, thus, saving a considerable amount on construction costs. When asked how he felt about the gas total energy system at Grace High School, Building Maintenance Superintendent Brother Donald said the system was ". . . economical and efficient, and operates with a minimum amount of maintenance and supervision."

Gas total energy systems are currently saving money for more than 350 installations like Grace High School all across the country. One can do the same for you in your operation. For more information, just drop us a line. You'll be very glad you did.

For information, current publications, or a preliminary study on the feasibility of a gas total energy system in your operation, simply write: Sales Promotion Department, Northern Natural Gas Company, 2223 Dodge Street, Omaha, Nebraska 68102. Of course you're under no obligation.

Northern Natural Gas Company

Home Office: Omaha, Nebraska

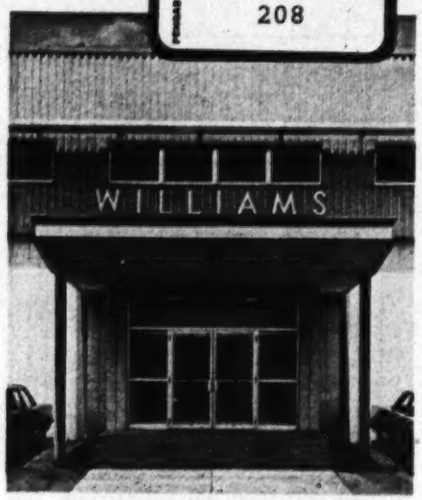
*All cost figures based upon a study by Charles J. R. McClure and Associates, consulting engineers, St. Louis, Missouri.

DEFENDANT'S EXHIBIT
208

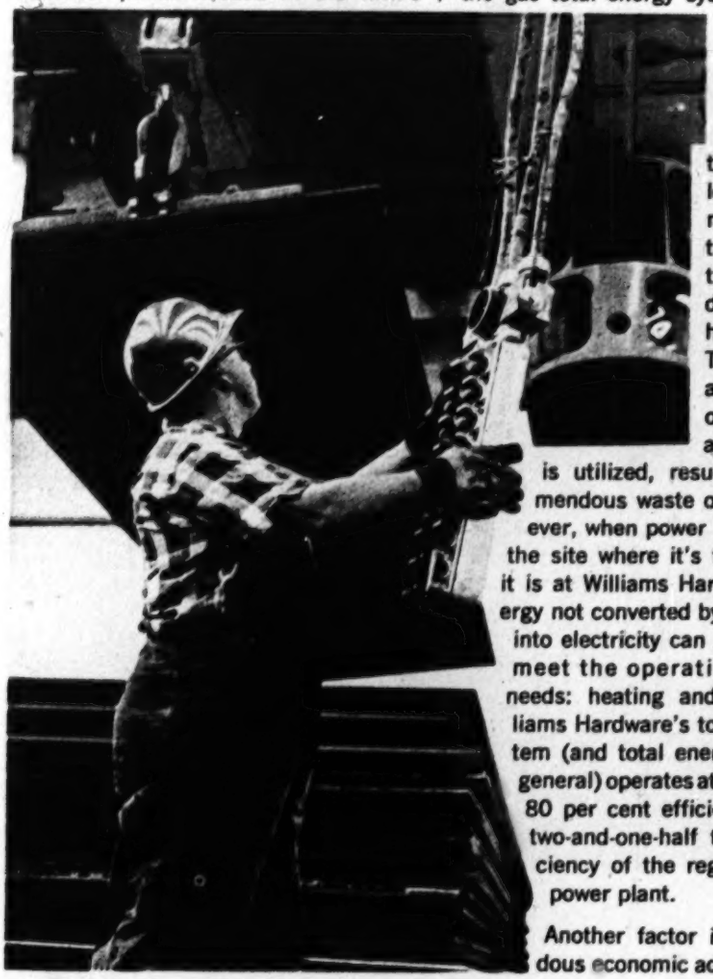
Williams Hardware buys all of its electricity from the gas company. And saves $14,000 a year in the bargain.

Impossible? Not at all. Williams Hardware, in Minneapolis, has not one, but two, gas total energy systems. (One with three engines and the other with two engines.) And in their second year of operation, they saved Williams more than $14,000 in purchased power costs, not to mention the money saved when power outages would have otherwise forced shutdowns.

But, just what is a gas total energy system? It's a method of power production based upon on-site generation with natural gas as the fuel. At the heart of Williams Hardware's total energy systems are five gas reciprocating engine-generator sets, which supply all of the electrical power needed in the firm's offices, hardware warehouse, and massive steel warehouse combined (a total of more than 1,200,000 kilowatts a year). Then, exhaust and engine-jacket water heat from the engines is captured by a heat exchanger to produce the energy needed to cool the offices and hardware warehouse (through a 50-ton steam absorption unit), and to heat the entire 178,000 square-foot complex as well. (A completely modern complex housing not only a vast stock of sheet steel and rolled bars, but cranes, shears, press brakes, saws, flame cutting equipment, and surface grinders as well.)

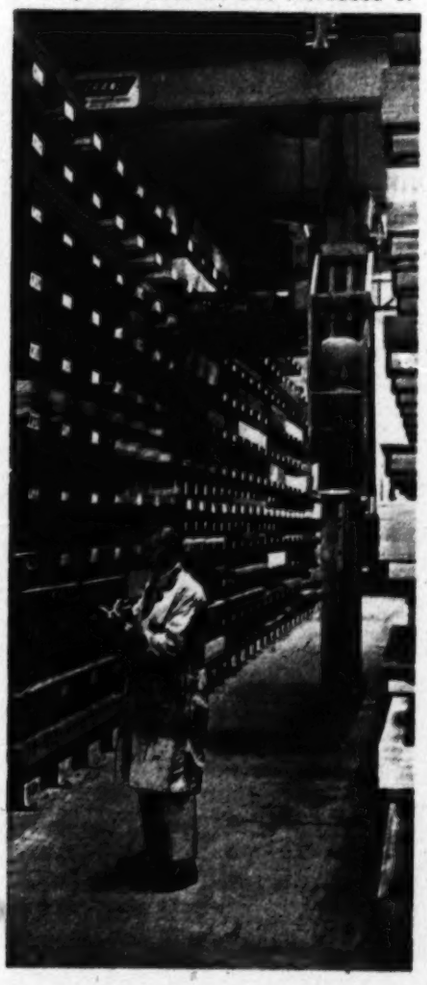


Herein lies the economy secret of the gas total energy system. In a central electrical power plant, more than 60 per cent of the fuel's potential energy is lost to the atmosphere — up the stack with the exhaust or discharged as heat to water. Therefore, only about one-third of the fuel's available energy is utilized, resulting in a tremendous waste of energy. However, when power is generated at the site where it's to be used, as it is at Williams Hardware, the energy not converted by the generator into electricity can be captured to meet the operation's thermal needs: heating and cooling. Williams Hardware's total energy system (and total energy systems in general) operates at approximately 80 per cent efficiency, or about two-and-one-half times the efficiency of the regular electrical power plant.

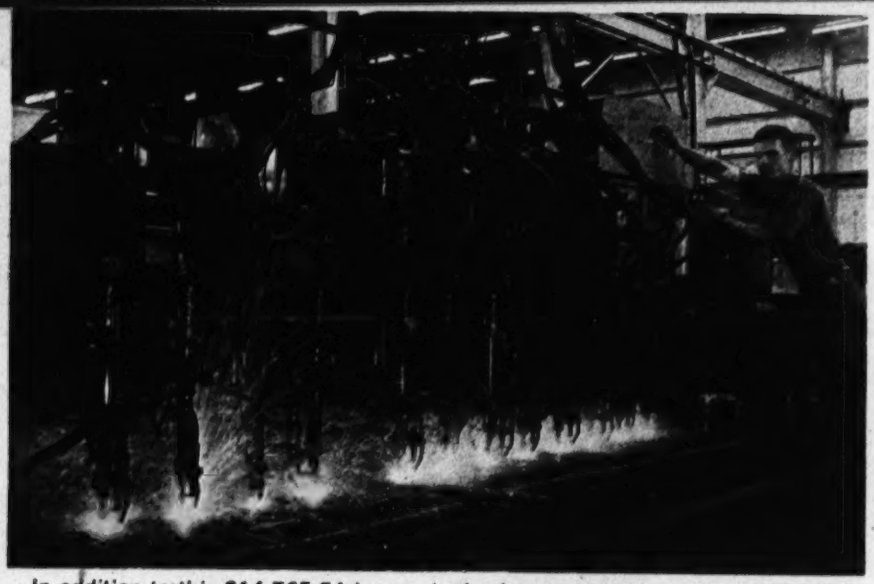


Another factor in the tremendous economic advantage of the gas total energy system over the regular electrical power plant is the fact that a gas total energy system is by far the more reliable of the two. For instance, since Williams generates all the electrical power they need right in their own plant, power outages due to weather disturbances have been virtually eliminated. Therefore, so have work stoppages resulting from these power failures.

But, what does all this increased ef-



1194



ficiency and reliability really mean to Williams? The same thing it would mean to you in your operation: Money!

Estimated Purchased Power Costs (1,200,000 kws) 5/8/67—5/8/68	$22,889.30
Purchased Gas Costs (Equiv. 1,200,000 kws.) 5/8/67—5/8/68	8,123.76
*Total Operating Savings 5/8/67—5/8/68	$14,765.54

In addition to this $14,765.54 in operating savings over a year's time, Williams also realized an additional savings of considerable size in that they didn't need to purchase expensive standby power equipment. You see, a gas total energy system virtually acts as its own standby. But is Williams Hardware really pleased with the performance of their two gas total energy systems? Well, according to Jack Ocenasek, warehouse superintendent, they're so pleased they're currently planning the installation of their sixth gas engine later this year so they can save even more money.

Gas total energy systems are currently saving money for more than 450 installations like Williams Hardware all across the country. One can do the same for you in your operation, whatever your operation is. So, if you're really interested in cutting down your cost of doing business (And who isn't?), look into a gas total energy system today. For more information, current publications, or a preliminary feasibility study, just write: Sales Promotion Department, Northern Natural Gas Company, 2223 Dodge Street, Omaha, Nebraska 68102. Of course, you're under no obligation.

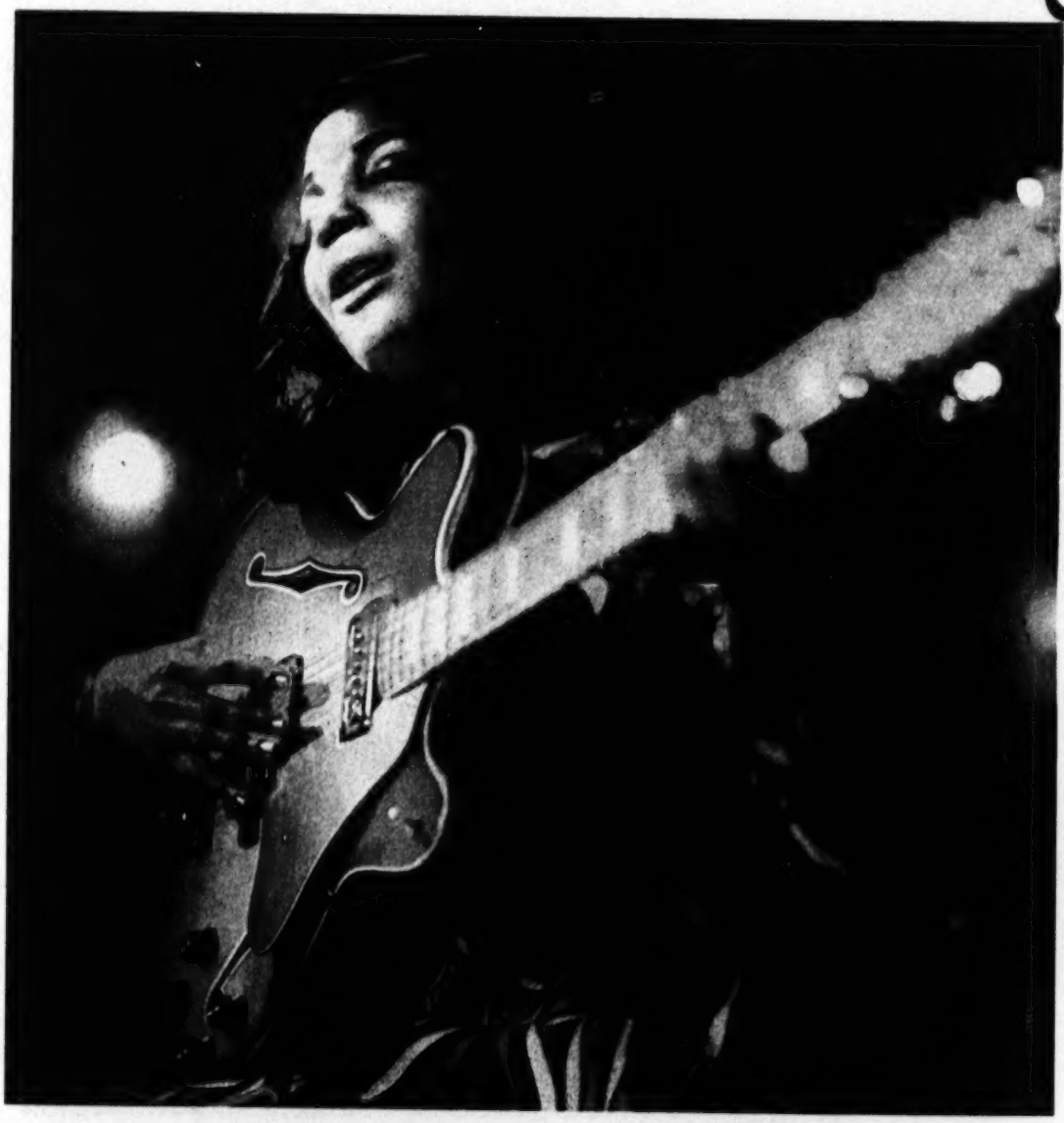
Northern Natural Gas Company

Home Office: Omaha, Nebraska

*These figures do not include maintenance costs on the total energy systems, which Williams feels are more than offset by heat-recovery savings resulting from the use of the total energy equipment.

1195

DEFENDANT'S EXHIBIT 209



Introducing the gas guitar.

The switch to Gas Total Energy is on.

No. It's not a joke. The electricity to power the guitar, and the psychedelic lights, and the juke box, and all the other exciting effects and practical appliances in many a night club comes from a natural gas total energy system, and not from a distant power station.

Why gas total energy? Because the owners and investors who build theaters, music halls, galleries and sporting arenas know that a gas total energy system will make their buildings all but self-sustaining. And at annual operating cost savings unheard of 10 years ago.

Total energy systems powered by gas generate electricity and utilize recovered heat on the site where the energy is going to be used. This means ultra-reliable electric power for lighting, motors, appliances . . . yes, even guitars. Heat recovered from the natural gas prime movers provide energy for space heating and cooling, water heating and industrial processing. The natural gas supply, which is the sole source of energy, is also available for cooking and other applications. Total energy systems operate at maximum efficiency, need little maintenance and act as their own standby power supply.

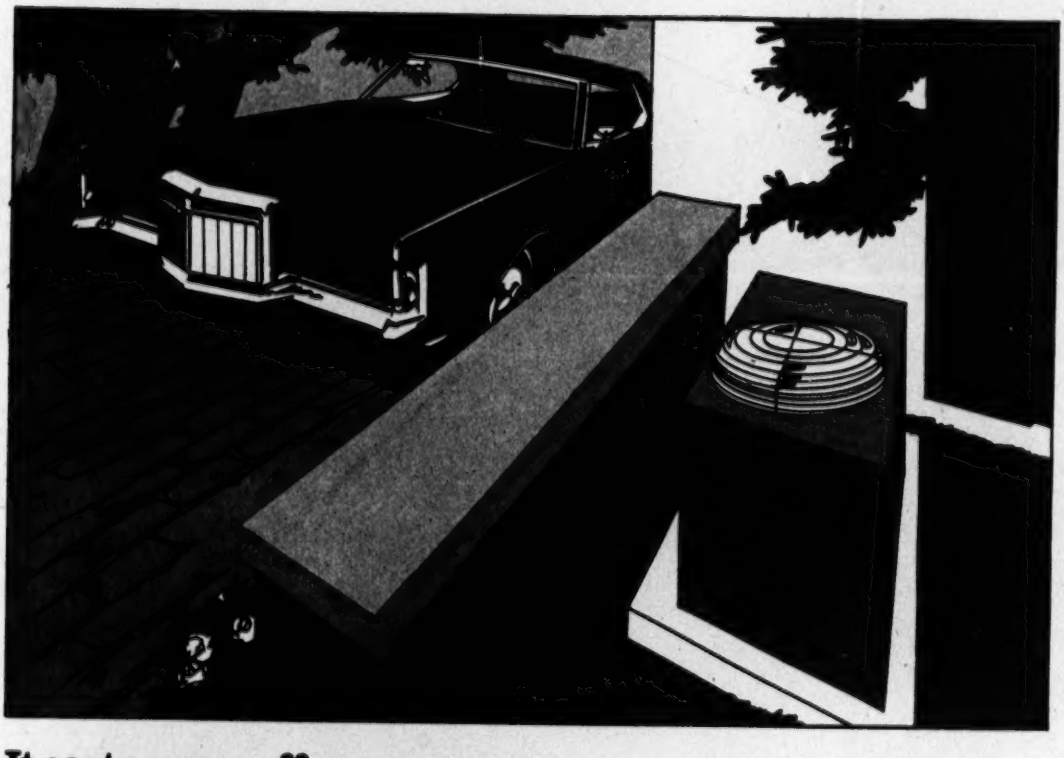
Sold on gas total energy? If not, you soon will be. For complete details contact your local gas company, or Bob McChane, Sales Promotion Department, Northern Natural Gas Company.

Northern Natural Gas Company

Home Office: Omaha, Nebraska

Gas air conditioning is like a car that's better than good.

DEFENDANT'S EXHIBIT 210



It costs more; offers more; runs more efficiently; gives you more day-to-day satisfaction; and, in the long run, saves you a pile of money on maintenance and operating costs. Sound good? Read on:

A gas air conditioning system is what you buy when you want something very special for the long haul.

More expensive? Sure. But it pays off every time it goes on.

It's cool, it's quiet, it's dependable—no matter how hot and humid the weather.

When other units grind and grunt, a gas unit purrs. There are no major moving parts to go wrong, fewer reasons to call in a serviceman.

If a major component (chiller, coil or control) should act up anytime *within two years*, Northern Illinois Gas will send a man out to fix it free... no charge for parts and labor. You save on operating costs, too. In fact, when you compare longer life and operating savings with electric, the higher initial cost of gas air conditioning disappears.

You pay nothing down and can take as much as five years to pay for your complete installation. Northern Illinois Gas can arrange the financing for you.

Interested? Get in touch with your gas air conditioning equipment contractor. Or call us.

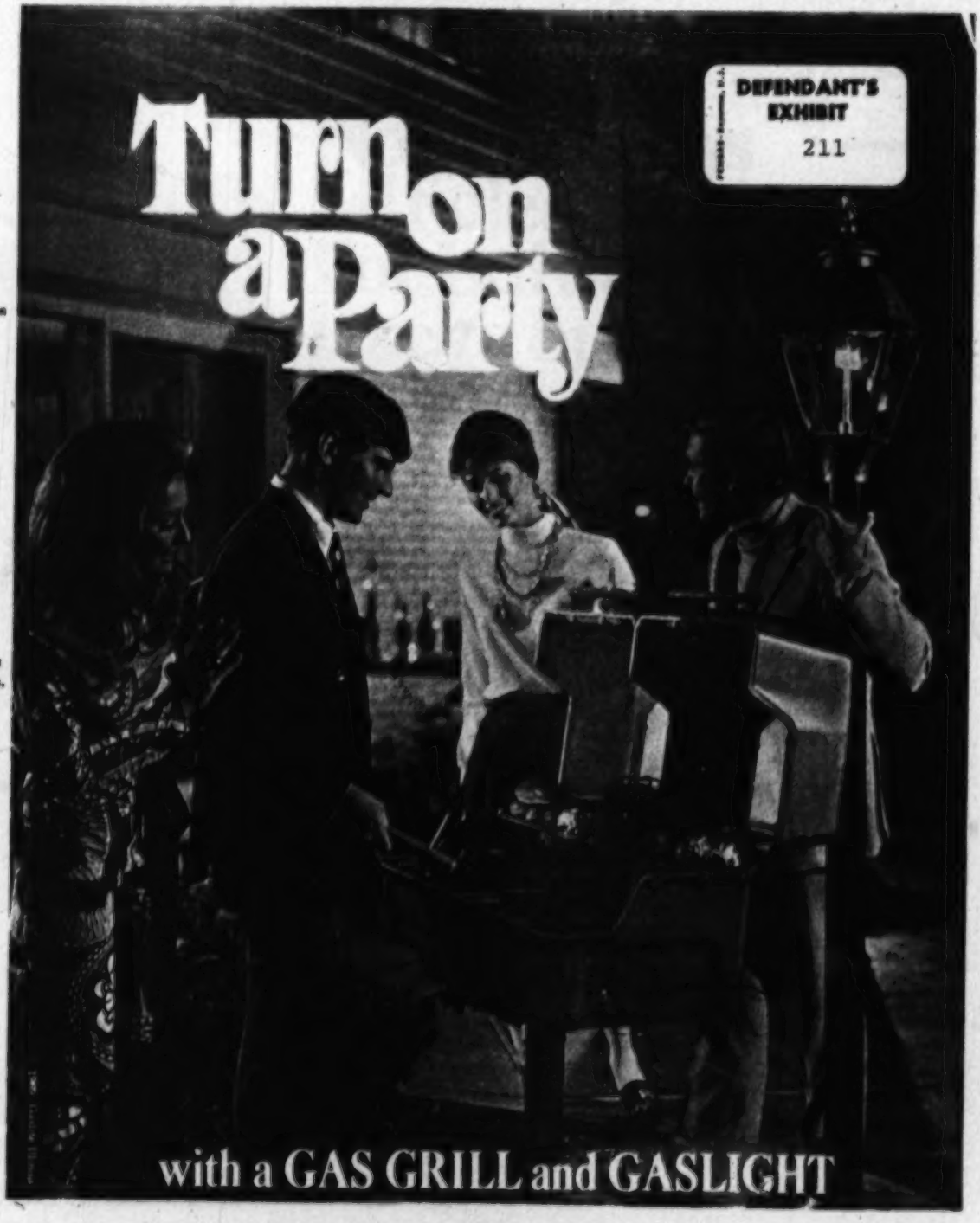
Northern Illinois Gas Company

Serving more than a million customers

C2

1197

ALL GOLDBLATT STORES
ALL SOLE BROTHERS STORES
ALL SEARS ROEBUCK & CO. STORES
ALL SINCLAIR DINO FARM CENTERS
ABBOTT
Seitz Plumbing and Heating
ANTIOCH
Wilson's Electric Shop
ARLINGTON HEIGHTS
Hill-Behan
BELVIDERE
Johnson's App. Ctr.
BENSENVILLE
Sterling Lumber
BLOOMINGTON
Wells Heating and Cooling
BYRON
Kobel's Plumbing and Heating
CHICAGO
Alan Inc. Appliances and Furniture
Allstate-Star Company
B.V.L. Sales and Service
Goodrich Tire and Rubber Co. Stores
Hill-Behan
Jemsek Lumber
Kline's Keen Edge Service Company
Mid-City Heating Company
Mutual Pipe and Supply Company
Republic Lumber Co.
Steward Roofing and Construction
CORTLAND
Service Gas Inc.
DEERFIELD
Village Hardware, Inc.
DES PLAINES
Ostrian Lawn and Garden Center
CRYSTAL LAKE
Rosenthal's Home Products Center
DIXON
Wall's LP Gas Service & Appl. Store
Schmidt Plumbing and Heating
DOWNERS GROVE
Stahler Heating & Cooling Co.
EVERGREEN PARK
Hi-Lo Hardware
FAIRBURY
Bob Nussbaum Plumbing and Heating
GENEVA
Ace Hardware
GIBSON CITY
Gibson City Plumbing and Heating
GLENVIEW
Yen's Hardware
GRAYSLAKE
Rachenbach's Pro Hardware Store
GURNEE
Petropoulos Bros. Appliances, Inc.
HANOVER PARK
Sterling Lumber
HARVEY
Ackerman's Plumbing and Heating
HIGHLAND PARK
Douglas TV and Appliance, Inc.
Highwood Radio & Appliance Co. Inc.
Patrick Moroney Plumbing and Heating
Ravinia Hardware
Ravinia Plumbing and Heating Co., Inc.
HINSDALE
Soubon Hardware Store
HOFFMAN ESTATES
Ray's Heating and Plumbing Company
HOMEWOOD
Harold's Garden Center and Nursery
Edward Hines Lumber
Sun Ray Heating Inc.
HOOPESTON
Hoopestom Plmb. & Heating
JOLIET
Joliet Home Heating
KANKEE
Kaiseman Plumbing and Heating
LA GRANGE
Dick's Hardware and Paint
LAKE FOREST
V. J. Killian Company
LIBERTYVILLE
Geiger Heating Company
LYONS
Star Piping and Heating
Mc HENRY
R and D Heating-Cooling Company
MAYWOOD
Riley Heating and Cooling
MT. PROSPECT
Edward Hines Lumber Company
Kersting's Garden Center
MOMENCE
Town and Country Furniture and Appl.
MUNDELEIN
Mitchell Heating Company
Hill-Behan
NORTHFIELD
Gene Hardware and Sports
OAK LAWN
A Rent Sales and Service
ONARGA
Onarga Heating, Cooling and Plumbing
OREGON
Johnson's Appliance
LOS HEIGHTS
glen Plumbing
OTTAWA
Smith Plumbing and Heating
PRINCETON
Princeton Gas Appliance
RIVER GROVE
Elm Sheet Metal
ROCHELLE
Rose Bottled Gas
ROCK FALLS
Flamegas Company of Illinois
ROCKFORD
A. F. Goodrich
Tri-State Fireplace Enterprises
ST. CHARLES
Parker Builders Supplies Inc.
R. L. Wagner and Son
SCHILLER PARK
Hill-Behan
SKOKIE
Ace Store No. 9
Northshore Refrigeration Company
Skokie Patio and Garden Center
SOUTH CHICAGO HEIGHTS
Earl's Appliance
WAUCONDA
Blackburn and Broughton, Inc.
WAUKEGAN
Ace Hardware Store
Harmony Haven TV and Appliances
Midwest Furnace Company
10th Street Hardware
United Heating Company
Wendrich-White Inc. Plumb. and Heat.
Whitten Heating Company
WESTERN SPRINGS
Village Hardware
WILMETTE/WINNETKA
Kirkland Mower Service
WINNETKA
V. J. Killian Company
WORTH
Worth Hardware Inc.
YORKVILLE
Schneider Refrigeration and Appliance
ZION
Kore Heating Company



We call it the Patio Pair...by Charmglow

Now it's party-time in no time at all! A modern gas grill turns on delicious charcoal taste instantly with a simple turn of the dial. Lets you cook with controlled heat . . . with even heat . . . without charcoal mess or bother.

And to put more lovely light on the party, the perfect patio companion is an elegant gaslight. Casts its soft warm light over your party with a flair that says, "you're welcome here." Yet guards your house against prowlers when the party's over.

Whether your next party be for birthdays or for entertaining...for the whole family or just for the two of you, turn it on instantly with a gas grill and companion patio gaslight.

Your family will call it a blessing. We call it the patio pair. How do you get yours? Call one of these near-by dealers now.

ALSO AVAILABLE FROM:
NORTHERN ILLINOIS GAS COMPANY
CENTRAL ILLINOIS PUBLIC SERVICE CIPS

ILLINOIS, INC.
7221 WEST 59TH STREET / ARGO, ILLINOIS 60501

1198

DEFENDANT'S
EXHIBIT
212

Now. The gas self-cleaning oven. For builders who like to build sales. Period.

Self-cleaning gas ranges by Magic Chef.

It's the biggest, wildest, most exciting Gas Industry promotion ever. Period.

Cash in on the massive advertising attack, and build around it. Because *this* is the year of the *gas* self-cleaning oven.

Your home-building and home-remodelling prospects will be seeing it on television. And reading about it in Life and other national magazines. And being exposed to it almost everywhere appliances are sold.

This all-out promotion will announce that the gas self-cleaning range is fast, cool, and economical. It's available in slide-in, free-standing and eye-level models —30 and 36 inch widths—all colors. Remember that more of your customers prefer gas to begin with—and now that gas has a self-cleaning oven, more and more people will be joining the ranks. How about you? See your Gas Company for details.

AMERICAN GAS ASSOCIATION, INC.

The theme is: The gas self-cleaning oven for people who like to cook. Period.

M-9005

This advertisement appears in
House & Home—May, 1969
Professional Builder—May, 1969
NAHB Journal—June, 1969
Building Supply News—June, 1969
Kitchen Business—June, 1969
American Building Supplies—June, 1969
(220094)

1199

Texas Gas invites you to the wireless house.

The wind may blow, the rains may fall, and the thermometer may have a nervous breakdown. But the wireless house runs along, quiet and calm, making its own heat and light, cool and climate as the seasons demand.

This is the house of tomorrow. No electric power lines subject to the whims of nature. The energy comes pure and quiet from one slim buried tube of natural gas. The gas heats and cools the house.

And some of the gas is converted into a new, super active form of natural gas called "Reformed Natural." This reformed natural gas runs all major appliances in the wireless house. It also operates a fuel cell that generates electricity.

Even though it may be some years before this environmental house is available on the market, it's just one more result of the restless gas technology that keeps our pipeline business growing steadily year after year.

And gas is only half of it. Texas Gas is a prime mover on the booming inland waterways, with our American Commercial Barge Line and our Jeffboat shipyard.

We're moving on the highways with two strong interstate trucking enterprises, Terminal Transport and Commercial Carriers.

We're also moving into the inland offshore oil and gas business through Crestwood Offshore Services.

And we're active in oil and gas exploration and production through our Texas Gas Exploration Corporation.

The fact is, while very few people were looking, Texas Gas moved all the way up into the top 100 U.S. Corporations.

Maybe it's time you took a closer look at Texas Gas. Write to: Texas Gas Transmission Corporation, Owensboro, Ky. 42301. We'll send you our Annual Report.

TXG

Texas Gas Transmission Corporation · American Commercial Barge Line Company · Jeffboat, Incorporated · Terminal Transport Company, Incorporated · Commercial Carriers, Incorporated · Rowan Dredging Company, Incorporated · Crestwood Offshore Services, Incorporated · Texas Gas Exploration Corporation

Here's the story of the Gas fuel cell.

DEFENDANT'S EXHIBIT 214

Imagine a small cabinet-size unit in your home that produces all the electricity you need.

Now you can stop imagining. Because silent, efficient Gas fuel cells have already proved themselves in thousands of hours of operation. These incredible units are actually the same in principle as the ones that have powered American spacecraft.

There's so much faith in the fuel cell that a group of Gas industry companies is investing more than $20 million in research and development. Successful research will result in moving the Gas fuel cell from prototypes to production models, and a major industry will be built.

The research investment is based on a simple fact: the most economical way to produce energy is to convert piped Gas at the point of use. And this is true for Gas heating, Gas cooling and "Gas electricity."

But is this really so surprising? After all, Gas is almost pure energy.

AMERICAN GAS ASSOCIATION, INC.

It's electrifying.

Greenwich Gas

33 Greenwich Ave. TO 9-4900

1201

ICC PRACTITIONERS' JOURNAL
July-August 1967

DEFENDANT'S
EXHIBIT
215

NUCLEAR STEAM-GENERATION OF ELECTRICITY: ITS IMPLICATIONS FOR THE FUTURE OF COAL TRANSPORT BY RAILWAY AND WATERWAY

JOHN C. SPYCHALSKI

Few commodities can match the longevity and significance of coal's contribution to the traffic and revenues of railways and water carriers. The primeval railways—or tramways—of Elizabethan England were contrived as a means for linking land-locked coal mines with navigable waterways.[1] Many of the railways and canals constructed on both sides of the Atlantic during what could be characterized as the dawn of the modern era in transport—1800-1835—counted coal as their single most important traffic item.[2] A century later, in 1928, the first year for which American railway freight tonnages and revenues were reported by commodity groups, coal ranked second as a source of both railway carloadings and revenues. It was exceeded only by the merchandise and miscellaneous groups, which encompass a multitude of heterogeneous finished and semi-finished manufactured goods not individually reported.[3]

But, changing technology and rival fuels challenged coal's dominance as a source of energy after 1930. Oil and natural gas virtually eliminated coal in the locomotive and maritime fuel markets and reduced coal's use (measured in tons) for residential and commercial heating by approximately 85 percent between 1945 and 1965.[4] Coal sales to firms in the manufacturing and mining industries suffered declines of lesser magnitude during the same time period.[5]

These events held potentially negative consequences for the principal modes of coal transport. Nevertheless, rising sales of coal to the electric

---

Dr. Spychalski is Assistant Professor of Transportation, College of Business and Public Administration, University of Maryland.

---

[1] Charles E. Lee, The Evolution of Railways (London: The Railway Gazette, 1937), pp. 13-22.
[2] W. T. Jackman, The Development of Transportation in Modern England (2nd edition, revised, London: Frank Cass & Co., Ltd., 1962), Chapter VII, and E. R. Johnson and T.W. Van Metre, Principles of Railroad Transportation (New York: D. Appleton and Co., 1918), Chapter II.
[3] Railroad Transportation, A Statistical Record (Washington, D.C.: Association of American Railroads, Bureau of Railway Economics, 1965), pp. 22-23.
[4] Bituminous Coal Facts 1966 (Washington, D.C.: National Coal Association, 1966), p. 80.
[5] Ibid.

utility industry[6] and to foreign buyers together with motor transport's capture of much actual and potential railway traffic in finished and semi-finished goods preserved coal's rank as a contributor to railway carloadings and revenues. Coal presently accounts for approximately 19 percent of total carloadings and produces about 12½ percent of all railway freight revenues.[7]

The maintenance of this rank has been achieved in the face of competition from new substitutes for the rail movement of utility steam coal.[8] Water carriage—limited, of course, to transport markets served by navigable waterways—represented the only alternative for large-volume, longer-distance coal movements until 1957, when a 108-mile pipeline carrying coal in slurry form was placed in operation between a mine at Cadiz, Ohio, and a generating station in Cleveland. Its subsequent technological and economic success sparked proposals to serve other coal transport markets with slurry pipelines. The late 1950's also saw technological advances in the long-distance transmission of high-voltage electricity. These advances increased the economic feasibility of substituting the conduction of electricity produced at locations proximate to coal deposits for the long-distance haulage of coal. The railways effectively countered the slurry pipelines—and, to a lesser extent, mine-mouth generating stations—with rate reductions based on (1) lower profit margins and (2) decreases in coal movement costs achieved through such innovations as unit trains and larger-capacity rolling stock.[9]

Coal has represented about 23 percent of the total net tons of all commodities carried by inland waterway (exclusive of the Great Lakes) since 1960.[10] In absolute terms, total inland waterway coal traffic increased from 65.9 million tons in 1958 to 86 million tons in 1964. Electric utility steam coal's share of this tonnage increased from approximately 50 percent in 1958 to 58 percent in 1964.[11]

Coal traffic on the Great Lakes rose from 40.2 million tons in 1958 to 51.3 million tons in 1964, but the portion of this traffic destined for electric utilities fell from approximately 58 percent in 1958 to 40 percent in 1964.[12] Coastal shipping and motor carriage also participate in the movement of utility steam coal, but in amounts substantially below those hauled by railway and inland waterway.[13]

---

[6] Coal sales to utilities rose from 27 million tons to 242.7 million tons between 1933 and 1965. Ibid.

[7] Ibid., p. 99; and Railroad Transportation, A Statistical Record, op. cit.

[8] Utility steam coal represents between 55 and 65 percent of total railway coal tonnage. More precise data are not available. Bituminous Coal Facts, op. cit., p. 96.

[9] Modern Railroads, Vol. 21, No. 2 (February, 1966), p. 80; and Bituminous Coal Facts, op. cit., p. 100.

[10] 1964 Inland Water-Borne Commerce Statistics (Washington, D.C.: The American Waterways Operators, Inc., November, 1965), p. 12.

[11] Bituminous Coal Facts, op. cit., p. 96.

[12] Ibid. Data presented for the inland waterways and Great Lakes include tonnage carried on both a for-hire and a private basis. Revenue data for coal carried by commercial water carriers are unavailable.

[13] Ibid.

The Atom Enters

Even as railway corporate strategists were drawing measurable success from their counterattack against coal slurry pipelines and high voltage long distance electricity transmission, they, together with coal-hauling water carriers, moved toward a confrontation with the spectre of nuclear steam-generation of electricity.

During the early 1960's, nuclear power's potential economic advantage appeared promising but far from realization. Coal's continued domination of the present and near-term future of steam electricity generation seemed secure. The economies of coal-fired generating technology in its most advanced stages were generally considered to be markedly superior to anything that nuclear power could muster.[14] But suddenly—more so than even some of those closely associated with the development of nuclear steam electricity generation had predicted—the atom overtook coal. Nuclear energy's share of total electricity generating capacity ordered new jumped from 10 percent in 1965 to over 50 percent in 1966.[15] This abrupt triumph resulted from various technological advances which, taken collectively, occasioned significant reductions in both the capital and operating costs of nuclear steam power plants.

An indication of the magnitude of these reductions is provided by the fact that nuclear power stations now on order or under construction are expected to produce electricity at costs ranging downward from 3.68 mills per kilowatt hour.[16] This estimation includes allocations for depreciation and interest expenses.[17] By contrast, nuclear stations placed in operation during the early 1960's produced power at cost levels ranging from 4.00 mills per kilowatt hour to 9.37 mills per kilowatt hour *exclusive* of depreciation and interest expenses.[18]

Operating costs of privately- and publicly-owned coal-fired generating stations in service in the United States during 1965 ranged from below 2.5 mills per kilowatt hour to above 5.51 mills per kilowatt hour. The operating costs of some of these plants exceeded 10 mills per kilowatt hour (see Tables 1 and 2). These cost data include labor, fuel, and maintenance expenses but exclude allowances for depreciation, interest, and administration.

Some means for comparing the capital costs of coal-fired plants with those of nuclear-fired installations can be obtained by an inspection

---

[14] William Webster, "The Commercial Future of Nuclear Power," Edison Electric Institute Bulletin, Vol. 34, No. 9 (October, 1966), Section I, p. 328.

[15] Barron's November 7, 1966, p. 5; and The Wall Street Journal, March 15, 1967, p. 32.

[16] Public Utilities Fortnightly, February 2, 1967, p. 59.

[17] And thus is dependent on certain assumptions concerning estimation of the plants' useful life and the division of costs incurred during construction between capital and expense accounts.

[18] Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965, (Washington, D.C.: Federal Power Commission, 1966), pp. 157-161.

of the investment per kilowatt of installed capacity for each type of plant. Capital costs for nuclear plants presently range from about $175 per kilowatt of installed capacity for plants of 300,000 kilowatts capacity to between $120 and $110 per kilowatt of installed capacity for 1,200,000 kilowatt plants.[19] As Table 1 indicates, the capital costs of coal-fired stations appear to be less than those for nuclear plants in the 275,000-300,000 kilowatt capacity range. However, nuclear capital costs lie below those of coal for larger-sized installations.

A dramatic manifestation of nuclear energy's apparent economic triumph over coal in relatively large generating installations occurred during the summer of 1966, when the Tennessee Valley Authority ordered a 2,196,000 kilowatt capacity nuclear-fueled power station. The Authority estimated that this plant would produce electricity at a total cost of 2.39 mills per kilowatt hour, 18 percent lower than the estimated cost of a new coal-fired facility of equivalent capacity. Moreover, the Authority's nuclear station will be located virtually atop low cost steam-coal deposits.[20]

Table I. Plant Capital Costs and Annual Production Expenses for Selected Coal-Fired Generating Stations, 1965 [1]

Name of Owning Utility and Plant	Plant Capacity (kilowatts)	Plant Investment Cost per Kilowatt Hour of Installed Capacity (dollars)	Total Production Expenses (mills per kilowatt hr.) [2]	Initial Year of Plant Operation
Alabama Power Company, Greene County Plant	272,000	$126	2.67	1965
Public Service Electric and Gas Co. (New Jersey), Hudson Station	454,800	$158	3.71	1964
Tennessee Valley Authority, Widows Creek "B"	1,125,000	$117	2.32	1961
Indiana-Kentucky Electric Corp., Clifty Creek (Indiana)	1,303,600	$115	2.15	1955
Appalachian Power Co. (American Electric Power System), Kanawha River	426,000	$128	1.98	1953
Appalachian Power Co. (American Electric Power System), Philip Sporn	1,060,000	$121	2.16	1950

[1] Source: Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965 (Washington, D. C.: Federal Power Commission 1966) p. 2, 39, 88, 126, 146.

[2] Includes maintenance, labor, and fuel and excludes depreciation, interest, and administrative overhead.

[19] Public Utilities Fortnightly, op. cit., p. 54.

[20] Tom O'Hanlon, "An Atomic Bomb in the Land of Coal," Fortune, Vol. LXXIV, No. 4 (September, 1966), p. 132.

The Outlook for Utility Steam-Coal Transport

With these events in hand, what course can be plotted for the future of utility steam-coal carriage? The Tennessee Valley Authority's decision to locate a nuclear-fueled facility proximate to steam-coal deposits [21] is a potent thrust in support of the view that nuclear power can compete successfully with coal in virtually any geographic location. Nuclear power's ability to permanently retain this advantage will depend on the future trend of its operating and capital costs vis-à-vis those of coal-fired plants, and the atom's prospects seem to be relatively more favorable.

Available evidence indicates the likelihood of a long-run downtrend in the operating costs of boiling-water and pressurized-water type reactors now in service and on order.[22] Fuel costs for these plants, presently about 1.8-2.0 mills per kilowatt hour, are expected to decline below 1.2 mills per kilowatt hour by 1980 as a result of (1) successive reductions in the costs of fabricating and reprocessing nuclear fuel; (2) reductions in the length of time required for replacement of a reactor's "spent" fuel core; and (3) the design and manufacture of more efficient fuel cores capable of being used in reactors of present vintage.[23] Even lower fuel costs appear attainable when and if one or several of a variety of more sophisticated types of reactors presently in planning and experimental stages become operationally feasible from both a technological and an economic standpoint.[24]

Nuclear power generation costs might be reduced in some geographic locations through joint-use applications.[25] For example, a group of Southern California utilities are presently negotiating an agreement to build a nuclear desalination plant that will also produce electricity for distribution through their systems.[25]

Nuclear generating units of existent design promise marked economies of scale. For example, the Commonwealth Edison Company's Dresden No. 2 nuclear plant, ordered in 1965, is only 20 percent larger than the same firm's first atomic plant, Dresden No. 1, which began operating in 1960. Yet, Dresden No. 2 is expected to produce four times as much electricity as Dresden No. 1 is capable of producing at half the cost of

---

[21] It appears that the Authority is not yet firmly convinced that nuclear power has established a permanent economic advantage over coal. The Authority has since ordered a second nuclear-powered station, but the contract for it includes a cancellation clause that can be exercised if the tide of energy cost economies should turn back toward coal. (Business Week, January 28, 1967, p. 89).

[22] An exposition of the design, construction, and operation of nuclear generating units lies beyond the purpose of this paper. For treatments of these topics, see, e.g.: Public Utilities Fortnightly, February 2, 1967, op. cit.; William Webster, op. cit.; and Fortune, op. cit.

[23] Public Utilities Fortnightly, op. cit., p. 56; and William Webster, op. cit., p. 328.

[24] Ibid.; "The Next Step is the Breeder Reactor," Fortune, Vol. LXXV, No. 3 (March, 1967), pp. 121-123; and The Wall Street Journal, March 16, 1967, p. 6.

[25] The Wall Street Journal, March 10, 1967, p. 4.

Dresden No. 1.[26] Such economies will complement recent technological innovations which have greatly reduced the costs of long-distance high voltage power transmission.

Non-nuclear steam-electric power production costs per kilowatt hour fell 10.44 percent between 1956 and 1965,[27] but this decline leveled off markedly during 1966 because "(c)ost reductions related to the continuing increase in the size and efficiency of generating units and delivered fuel cost no longer dominate the cost pattern."[28]

This appraisal applies to gas- and oil-fired units as well as to coal-fired stations, but evidence exists which suggests that a separate evaluation for coal would not produce a different answer. Significant reductions in fuel costs, which comprise between 75 and 80 percent of the average coal-fired station's total annual operating costs (exclusive of depreciation and interest)[29] appear improbable. Coal's f.o.b. mine prices for sales to large-volume buyers have remained relatively stable since 1950,[30] and coal industry executives see little chance for reducing the price of their product.[31] The delivered price of coal has been lowered in recent years through coal freight rate reductions,[32] but there are signs that no margin exists for further reductions. In fact, some carriers recently increased rates on utility coal moved in trainload lots—movements for which charges had been drastically reduced relative to charges for single-car consignments during the early 1960's.[33] Coal's use-cost will also be increased by utilities' accedence to recent demands for adjustments designed to reduce the amount of air-polluting fly ash and sulfur dioxide spewed from power station smokestacks.[34]

The future course of total costs per kilowatt-hour for coal-fueled generating stations cannot be predicted in terms of meaningful quantities. However, there is no evidence of the existence of conditions capable of occasioning scale economies in coal-fired installations that approach the magnitude of those identified with nuclear plants.

The foregoing observations together with repeated upward revisions of estimated future nuclear generating capacity and the achievement of new highs in terms of the atom's share of generating capacity ordered during the closing months of 1966 and the opening months of 1967[35] suggest that further increases in the total demand for utility steam coal will be limited. Furthermore, most of the recently-ordered coal-fired

---

[26] "Nuclear Plants Turn Up the Juice," Business Week, March 11, 1967, p. 65; and Fortune, Op. cit.
[27] Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965, op. cit., p. xiv.
[28] Federal Power Commission, 1966 Annual Report, p. 45.
[29] Ibid.
[30] Ibid.
[31] O'Hanlon, op. cit., p. 133.
[32] Bituminous Coal Facts 1966, op. cit., p. 8.
[33] Burton N. Behling, A Review of Railroad Operations in 1966 (Washington, D.C.: Bureau of Railway Economics, Association of American Railroads, 1967), p. 27.
[34] "Research Goal: Solution of the Sulfur Problem," Coal Research, No. 25 (Winter, 1966), pp. 1-6.
[35] "Nuclear Plants Turn Up the Juice," op. cit.

generating stations will either be located near mine-mouths or linked to mines by slurry pipelines.[28] Thus, total demand for the (non-pipeline) transport of utility steam coal seemingly stands little if any chance of achieving further substantial growth.

Continuance of the present indicated relationship between operating and capital cost levels in nuclear and coal-fueled steam generating stations appears highly probable and would dictate that coal concede its utility steam generation market to the atom over the long run. This implies the emergence of a corresponding pattern of long-run declining demand for the transport of coal to existing coal-fired generating stations. Thus, private and public decision makers concerned with the performance of transport firms heavily dependent on utility steam coal traffic appear to be confronted by two primary considerations: (1) The rates at which existing utility steam coal transport markets will decline; and (2) The formulation and execution of policies designed to mitigate adverse effects of the loss of utility steam coal traffic.

Determinants of the Rates of Decline in Existing Utility Steam Coal Transport Markets

The future pattern of utility steam coal traffic will be determined fundamentally by the relationship between the costs of continuing to operate existing coal-fueled generating capacity and the costs of replacing it with nuclear installations. Abstracting for the moment from other influences on the replacement of coal by the atom, which will be discussed later, this means that the susceptibility to loss (in terms of time) of particular coal traffic movements will be a function of the level of operating costs of the plant to which the coal is delivered.

An assessment of such susceptibility for individual coal transport markets lies beyond the bounds of this paper. However, a suggestive indication of the susceptibility of the total utility steam coal transport market to loss through nuclear substitution can be obtained by comparing utility coal consumption data classified by power plant operating cost ranges with nuclear power plant operating cost data. Thus, a comparison of data presented in Table 2 with the previously-noted fact that nuclear power plants now on order are expected to produce power at estimated costs (including depreciation and interest) below 2.50 mills per kilowatt hour suggests that, of the total potential 1965 utility steam coal transport market, 66.6 million tons, or approximately 27 percent, could be characterized as immediately susceptible to loss, 97.1 million tons, approximately 40 percent, could be characterized as vulnerable to loss within an intermediate-term time period, and 55.5 million tons, approximately 23 percent, could be viewed as relatively immune to loss over the remaining physical lives of the plants in which it is burned.

---

[28] Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965, op. cit., p. x; and Electrical World, Vol. 167, No. 4 (January 23, 1967), pp. 67-68.

Table 2. Coal Consumption of Steam Generating Stations Classified by Level of Production Expenses, 1965 [1].

Total Production Expenses (mills per kilowatt hour) [2]	Number of Plants	Tons of Coal Consumed (000)
0 - 2.50	34	55,506.67
2.51 - 3.50	102	97,120.1
3.51 - 4.50	75	38,671.9
4.51 - 5.50	53	15,703.6
5.51 and above	66	12,239.7

[1] Source: Computed by the author from data reported in Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement—1965 (Washington, D.C.: Federal Power Commission, 1966), pp. I-136.

[2] Excludes interest, depreciation, taxes, and certain administrative expenses.

These data, the most recent available, must be used with the caveat that they (1) are unadjusted for privately-transported coal and coal which does not require long-distance movement by virtue of its consumption in mine-mouth power stations [37] and (2) represent only 219.2 million of the total 244.9 million tons of coal burned in steam generating stations during 1965.[38] The 25.6 million ton shortfall represents (a) coal burned in plants for which either incomplete or no operating data were reported to the Federal Power Commission and (b) coal consumed in plants producing both steam and electricity for sale.[39]

The rate of growth in the demand for electricity is another determinant of the pace at which coal-fired generating stations will be phased out in favor of nuclear plants. Questions can be raised about if and when capacity for supplying reactor equipment and/or nuclear fuel will be sufficient to fulfill demands for both new generating capacity and the replacement of existing capacity. These topics cannot be probed in depth here. However, it seems conceivable that the complementary relationship between long-distance high voltage electricity transmission and the scale economies of large-capacity nuclear generating plants could permit (to some degree, at least) the simultaneous replacement of smaller-capacity coal-fired stations and the addition of new generating capacity. Also, evidence exists that any bottlenecks which might arise in the supply of nuclear generating equipment and fuel will probably be of short- to intermediate time-length rather than of long-run duration.[40]

This raises the question of whether utility regulatory authorities would permit a level of earnings on new, technologically-advanced assets sufficient to sustain continuing financial obligations on retired, eco-

[37] Most of which rank high in terms of operating efficiency.

[38] Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965, op. cit., p. v, p. xv.

[39] Ibid.

[40] The Wall Street Journal, January 5, 1967, p. 30; and Ibid., March 15, 1967, p. 32.

nomically obsolete assets. The point at issue here is whether financial losses occasioned by economic obsolescence can and/or should be borne completely by utility common stockholders, by users of electricity, or shared on a proportional basis by these two groups.[41] If faced with the first-mentioned alternative, utility managers might be inclined to "run-out" coal-fired plants until their undepreciated balances fall very low.

One could also ask whether utility managements would retire economically obsolete but physically undepreciated coal-fired plants in the absence of financing-regulatory barriers. Some writers[42] contend that utility companies exhibit a meager propensity for making cost-cutting innovations because of (1) the relatively assured demand for electricity and (2) suggestions that commission-administered controls over utility earnings contain no provisions for rewarding those utility firms which alacritously pursue more efficient methods.[43] But, evidence exists that at least some utilities aggressively seek out ways for reducing their operating costs.[44]

Policies to Mitigate Effects of the Decline in Utility Steam Coal Traffic

Water Transport

Evidence of the movement value of inland waterway coal traffic is unavailable (see footnotes 10, 11, and 12, supra), and coal tonnage data are not reported separately for either the private and for-hire sectors of inland water carriage or the firms within each category. Nevertheless, data presented in Table 3 are sufficient to suggest that the loss of utility steam coal traffic could hold significant consequences for firms operating on certain waterways. Such losses will, however, probably tend to be concentrated over a relatively long-run time period,[45] because an inspection of the operating costs of waterside coal-fueled power stations[46] suggests that many of these plants lie in that range described previously in this paper as "relatively immune" to replacement by nuclear power before the end of their expected physical life. Thus, there appears to be little likelihood that the value of existing floating equipment dedicated to coal haulage—and for which no alternative employment

---

[41] This article takes no position on the problem. It is posed because policies designed to resolve it will affect the demand for utility steam coal transport service.

[42] See, e.g., Clair Wilcox, Public Policies Toward Business (Homewood, Ill.: R.D. Irwin, Inc., revised edition, 1960), pp. 771-772; and Horace M. Gray, "The Passing of the Public Utility Concept," The Journal of Land & Public Utility Economics, Vol. XVI, No. 1 (February, 1940), pp. 8-20.

[43] Wilcox, op. cit.

[44] See, e.g., "The Pathfinder for Nuclear Power," Business Week, March 11, 1967, pp. 77-78; and Hubert Kay, "We're the Most Enterprising Utility in This Country," Fortune, Vol. LXIX, No. 5 (May, 1964), pp. 138-141.

[45] Except, perhaps, for joint barge-rail movements.

[46] Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965, op. cit., pp. 1-161.

of equivalent profitability can be found—will fall victim to nuclear power."[47]

But, this condition should not be interpreted as freeing water carrier executives of their responsibility for basing investments in new coal-hauling equipment on (1) carefully-researched estimates of the longevity of their existing utility steam coal transport markets and (2) identification of the availability of alternative uses for barges and towboats dedicated to coal haulage. Those coal-dependent carriers which desire a corporate life extending beyond the existence of their utility coal transport markets must intensify efforts to develop traffic in other commodities.

Great Lakes-borne coal is moved in part by vessels which also carry other bulk commodities. Some lake ships see only coal-hauling service, but their age is such that they can probably serve out the duration of the Great Lakes' utility steam coal transport markets without replacement. They have already been depreciated to the point where an early collapse of those markets would not result in significant capital losses.[48]

Nuclear power's influence on utility steam coal traffic should also be considered in public investment decisions concerning both the improvement of existing waterways and the construction of new navigation routes. Some navigation projects currently in planning and construction stages[49] are intended for locations where a substantial volume of coal tonnage either presently moves (see Table 3) or is expected to move. Benefits-cost analyses of these projects should therefore be carefully scrutinized in an effort to prevent investments in situations where it appears that coal tonnage will not endure in amounts and time-periods sufficient to permit the realization of benefits in excess of costs.[50]

Railway Transport

The loss of railway utility steam coal traffic will most acutely affect carriers in the Eastern and Southern Regions, where coal accounted for 32 percent and 19 percent respectively of total revenue carloadings in 1965.[51] Table 4 indicates the extent to which individual carriers in these areas depend on coal traffic. A precise breakdown of the proportion represented by utility steam coal (as distinguished from coal destined for other uses) is unavailable, but, as noted previously, utility steam

---

[47] The physical life of a hopper barge of contemporary design generally ranges from 15 to 25 years.

[48] Transport Statistics in the United States for the Year Ended December 31, 1964, Part 5, Carriers by Water (Washington, D.C.: Interstate Commerce Commission, Bureau of Accounts, 1965), pp. 2-3.

[49] "List of Navigation Construction Projects and Planning Starts," American Waterways Operators Association Weekly Letter, January 28, 1967, Appendix.

[50] Political decision-making's role in navigation investment is acknowledged, but it should not prevent at least the suggestion of economically rational courses of action.

[51] Yearbook of Railroad Facts (Washington, D.C.: Association of American Railroads, 1966), p. 29. Coal accounted for 6.1 percent of total revenue carloadings in the Western District in 1965.

Table 3. Bituminous Coal and Lignite Tonnage on Selected Inland Waterways, by Total Amount and by Rank and Percentage of the Total Net Tons of All Commodities Moved, 1964.[1]

Waterway	Bituminous Coal and Lignite[2]		
	Total net tons	Rank Relative to total net tons of all commodities moved	As a percentage of the total net tons of all commodities moved
Mississippi River	10,203,437	2	6.0
Illinois Waterway	7,878,706	1	25.6
Calumet-Sag Channel	456,303	6	9.4
Ohio River	46,346,461	1	48.1
Alleghany River	2,795,145	1	57.4
Monongahela River	31,423,760	1	83.1
Kanawha River	7,580,265	1	60.5
Kentucky River	52,455	3	11.3
Green and Barren Rivers	10,353,876	1	99.9
Tennessee River	6,295,823	1	40.8
Black Warrior, Warrior and Tombigbee River System	2,162,926	1	29.2

[1] Source: Computed by the author from data presented in 1964 Inland Water-Borne Commerce Statistics (Washington, D.C.: The American Waterways Operators, Inc., 1965), pp. 7-21.
[2] Includes tonnage hauled by both private and for-hire carriers.

coal represents between 55 and 65 percent of all coal tonnage moved by the railway system as a whole. A crude indication of the value which this traffic represents can be obtained by observing that 55 to 65 percent of total railway coal revenues ranged from $182.4 million to $215.5 million, respectively, in 1963.[22]

Accurate measurements of railway coal traffic's relative profitability are virtually impossible to obtain. The Interstate Commerce Commission's Bureau of Accounts estimates that total coal traffic revenues amount to 108 percent of the out-of-pocket costs occasioned by coal movements.[23]

---

[22] Bituminous Coal Facts, op. cit., p. 99.
[23] Interstate Commerce Commission, Bureau of Accounts, Distribution of the Rail Revenue Contribution by Commodity Groups—1961, Statement No. 6-64, Washington, D.C., June 1964, p. 41. The bounds of this paper preclude an in-depth critique of the Commission's estimation procedures. However, it should be noted that the percentages presented here are products of gross averaging which, among other shortcomings, does not reflect the fact that rail unit costs and revenues on each type of commodity hauled differ with variations in traffic density and operating costs over specific segments of rail line. Thus, the Commission's estimates may be either higher or lower than the relationships actually realized on specific carload journeys produced by particular railway companies between given pairs of origin and destination points. The statistical representativeness of the Commission's estimates can also be questioned, because the Commission employs revenue data obtained from its one percent waybill sample.

Table 4. Bituminous Coal Revenues as a Percentage of Total Freight Revenues, and Bituminous Coal Carloadings as a Percentage of Total Carloadings, for Selected Railway Companies in the Most Recent Years of Data Availability.[1]

Railway Company	Year	Bituminous Coal Revenues as a Percentage of Total Freight Revenues	Bituminous Coal Carloadings as a Percentage of Total Carloadings
Chesapeake and Ohio	1965	47.2	46.4
Baltimore and Ohio	1965	25.4	33.3
Norfolk and Western[2]	1965	38.9	39.0
New York Central	1965	17.1	27.9
Erie-Lackawanna	1965	5.9	9.9
Southern	1963	13.8	17.2
Louisville & Nashville	1964	24.1 —	30.3
Illinois Central	1963	16.7	24.9
Delaware and Hudson	1965	10.0	8.3
Reading	1965	26.9	30.1
Central of New Jersey	1963	16.6	21.5
Lehigh Valley	1963	4.7	8.3
Boston and Maine	1963	5.5	4.6
Pennsylvania	1963	16.0	21.6
Chicago & Eastern Illinois	1963	22.5	31.8

[1] Source: Moody's Transportation Manual, 1966.
[2] Includes results for Wabash Railroad, Pittsburgh & West Virginia Railway, Wheeling and Lake Erie Railway, and the former New York, Chicago and St. Louis Railroad. The operations of these companies were combined with those of the Norfolk and Western by either lease or merger on October 16, 1964.

Several of the coal-dependent roads named in Table 4 enjoy strong (for the railway industry) rates of return, while the financial stamina of others can be characterized as modest during relatively high levels of general economic activity and precarious during recessional periods. However, some of the relatively strong roads are among those most dependent on coal traffic and revenues and should therefore not necessarily be viewed as the companies most likely to emerge from a permanent decline in coal traffic with their relative strength intact.

It should also be noted that most of the coal-fueled generating stations described previously in this paper as "most susceptible to nuclear conversion" or "susceptible within an intermediate time period" are rail-served.[84]

The foregoing observations emphasize the need for early recognition of, and action to cope with, the threat which nuclear power poses to coal traffic's future. Railway companies must intensify their efforts in the areas of market research, equipment design, and cost-pricing-profit

[84] Based on an inspection of information presented in Steam-Electric Plant Construction Cost and Annual Production Expenses, Eighteenth Annual Supplement, 1965, op. cit.

analysis to (1) identify potential new traffic in non-coal commodities and (2) define and provide the service-price combinations required to profitably realize that traffic. The achievement of needed cost-price and service-quality levels may, in some cases, require radical departures from conventional operating patterns.[85] Such departures would require aquiescence to work-rule changes by labor organizations representing railway operating employees.

Railway investments in new coal-hauling assets—which continue to be made in substantial amounts at the present time [86]—must be based on rigorous analyses of the specific coal transport markets which they are intended to serve in order to minimize the probability of losses.

Those acquainted with railway traffic flow patterns will recognize that certain segments of line-haul and terminal capacity presently serving utility steam-coal movements cannot be absorbed by other traffic and will therefore have to be withdrawn from service following utility steam-coal traffic's demise. This condition together with the fact that considerable redundancy already exists in portions of the railway plant makes it imperative that barriers to the rationalization of excess capacity be removed if the financial debilitation resulting from utility steam-coal traffic losses is to be minimized. Thus, public and corporate policies that inhibit the consummation of railway mergers designed to eliminate duplicate plant and equipment must be reversed.

Conclusion

Nuclear power will abruptly terminate demand for the transport of utility steam-coal. In fact, such demand will probably rise somewhat in the immediate future. But, it will decline to the point of extinction in the long run if nuclear power maintains its economic advantage over coal-fueled electricity generation. Thus, those responsible for policy-making in carrier board rooms, government chambers, and union lodges should begin now to formulate and execute plans that will permit an orderly transition to dependence on other traffics.

---

[85] See, e.g., "Reading Makes a Bee-Line for Profits," Railway Age, Vol. 162, No. 4 (January 30, 1967), p. 42.

[86] See, e.g., Nancy Okulanis and Kathleen Ineman, "Railroad Improvements: As 1967 Rolls In," Modern Railroads, Vol. 22, No. 1 (January, 1967), pp. 100-197.

A monthly review from the Energy Division of

THE CHASE MANHATTAN BANK

New York, New York 10015

DEFENDANT'S EXHIBIT 216

THE PETROLEUM SITUATION

FOR RELEASE: OCTOBER 27, 1969

IN SEPTEMBER, 1969

DEMAND

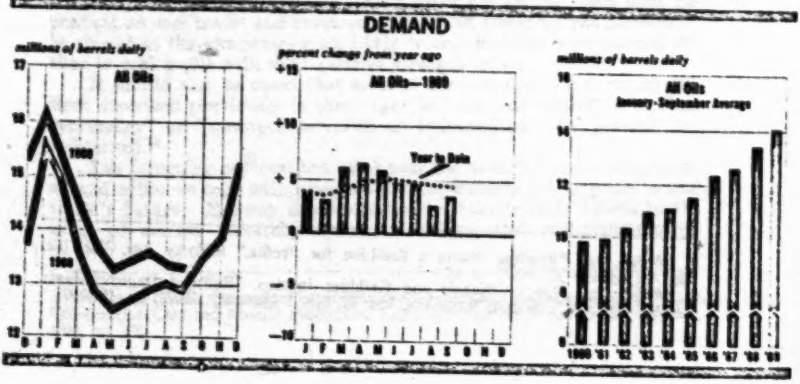
The first three quarters of 1969 have already passed into the record book. It may, accordingly, be useful to look back for a moment and consider how the year has developed. The various measures of fiscal and monetary restraint that were supposed to slow down the rate of economic growth may be starting to take effect at last, but there is little evidence that they produced the desired results earlier in the year. Gross National Product grew at the rate of 7.5 percent a year during the first three quarters of 1969 -- a faster rate of growth than had been anticipated a year earlier.

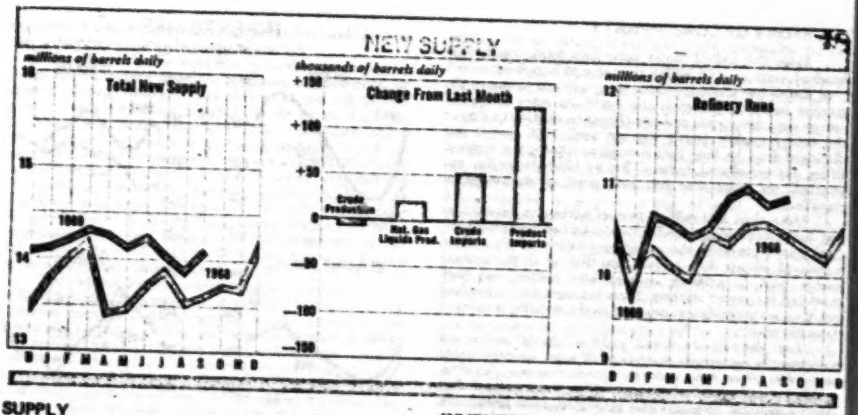
Reflecting the tempo of the economy, the demand for petroleum products also grew faster than expected during the January-September period. The growth amounted to 4½ percent, and this is likely to be sustained over the balance of the year. Not all of the products performed equally well, of course. The middle distillates tended to fall short of earlier expectations, but this was more than offset by the strong demand for gasoline and residual fuel.

The extent to which automotive gasoline demand is dependent upon general business activity is not always fully appreciated. But it should be remembered that trucks and buses account for about one quarter of the total demand and of the amount consumed by passenger cars, 40 percent represents travel to and from work. Accordingly, given the strong economic growth that the nation has experienced this year, it is not surprising that the demand for automotive gasoline during the first three quarters of 1969 registered a 4.8 percent increase over the year earlier period. Demand for aviation gasoline is still dropping, but since this represents less than 2 percent of the total use of gasoline its influence is negligible.

At the outset of the year, very little growth seemed in prospect for residual fuel oil. And yet, by September, the year to date growth for this product amounted to about 5 percent. The particular area of strength is the Electric Utility market on the East Coast, where a combination of circumstances have worked to the advantage of oil. Air pollution regulations have raised serious problems for coal -- the dominant fuel in the Electric Utility market. And an ample supply of low sulphur residual fuel at a competitive price has enabled oil to take full advantage of the situation.

Preliminary figures for the month of September show a 3.5 percent rise in demand for all oils over the level a year ago. Gasoline was the star performer. Demand for this product increased by 7.5 percent and, in fact, accounted for more than four fifths of the total rise in petroleum product demand. The fuel oils fared less well. Distillate lagged behind the year earlier level of demand, and residual fuel showed little change.





SUPPLY

Crude oil production in the United States satisfies two-thirds of the nation's demand for oil. It might be expected, therefore, that crude oil output would grow in line with demand. During the first nine months of 1969, however, there was virtually no change in this source of supply relative to the year earlier period. Alaska and Louisiana posted gains in crude oil production which were largely offset by lower production elsewhere in the nation. Texas, which accounts for a third of the nation's output, produced no more oil in the first three quarters of 1969 than it did in the same period a year earlier.

The other source of domestic raw materials – natural gas liquids – averaged 1.6 million barrels daily and registered a 5.4 percent increase during the first nine months of 1969. Thus, domestic sources provided almost four-fifths of the total new supply of oil during the year to date.

Imports of foreign crude oil during the first three quarters of the year averaged 1.4 million barrels a day, 13.5 percent more than in the same period last year. Half of the increase, however, is accounted for by higher imports of Canadian crude.

In 1968, crude oil shipments from Canada into the area East of the Rockies averaged 300 thousand barrels daily. For 1969, an import ceiling of 306 thousand barrels daily was established by the Department of the Interior and the Canadian government. Because Canadian imports exceeded this limit by almost 40 thousand barrels daily between January and May, the Administration again conferred with Canadian officials and a new understanding was reached stipulating that imports would not exceed the original 306 thousand barrel a day limit from May to the end of this year. Since May, however, Canadian crude imports have averaged 334 thousand barrels a day and in September they reached 385 thousand a day. On the West Coast, Canadian crude imports rose from 164 thousand barrels daily in the first nine months of 1968 to 210 thousand a day this year.

Imports licensed directly by the government are running ahead of the quota established for 1969, but this will have to be corrected during the fourth quarter.

In September, there was a small increase in the domestic production of crude oil and natural gas liquids. A 17 thousand barrel a day increase in Louisiana indicated the beginning of recovery following the over 100 thousand barrel a day curtailment of crude production which resulted from hurricane Camille. Alaskan crude output reached a record 219 thousand barrels a day – 21 percent above the year earlier level and 11 percent above the prior month's production.

INVENTORIES

Stocks of all oils at the end of September amounted to 1,034 million barrels, only a million barrels higher than a year ago. Individual product inventories appear to be in good shape. Distillate fuel oil stocks are somewhat below the record high level which was reached in September last year, but they are more than 10 million barrels higher than in any previous year. Residual fuel oil stocks, too, have dropped back from last year's record level.

The inventory build-up in September was on the heavy side – 28 million barrels were added to refined product storage. Crude oil stocks, on the other hand, were drawn down by 5 million barrels, resulting in an over-all inventory accumulation of 23 million barrels for the month.

PRICE

On the West Coast, wholesale prices of both premium and regular grade gasoline dropped a half cent a gallon in September. They are now at their lowest level for this month in the past two years. Mid-Continent premium and regular grade gasoline closed September with ½ cent recovery, after having suffered a full cent decline in August. Compared with a year ago, however, gasoline was still down ½ cent a gallon, and was as much as ¾ cent a gallon below the level of two years ago.

Distillate wholesale prices increased ½ cent in the Mid-Continent area to 9.5 cents per gallon – ½ cent above the year earlier level. Chicago wholesale prices for heating oils moved .15 cents a gallon higher during the month. This restored prices to the same level as prevailed prior to the .15 cent drop of July 1.

There was substantial improvement in propane prices during September. The increases amounted to three-quarters of a cent a gallon in New York harbor and a full cent a gallon in the Mid-Continent. Propane prices in both these markets are now above year earlier levels but they still have a long way to go before they can be considered normal.

October 27, 1969

John D. Emerson
Energy Economics Division

THE STORY OF COAL – PART I

Since the United States came into being, nearly two hundred years ago, 40 billion tons of coal have been mined. Coal fueled our transition from an agricultural nation to the greatest industrial power in the world. As other sources of energy were developed, coal was obliged to surrender a part of the energy market, but it was not until 1950 that it was dislodged from its long held first place. During the nineteen fifties, the use of coal declined. But by 1960 the decline was arrested, and since that year coal consumption has grown steadily.

More than 500 million tons of anthracite, bituminous and lignite coals were consumed in the United States last year. Coal mines provided the energy equivalent of 6½ million barrels of oil per day, or fully one-fifth of all the primary energy used. In addition, another fifty million tons were produced for export markets. These tonnages are huge indeed but they are insignificant compared to the available reserves of domestic coal.

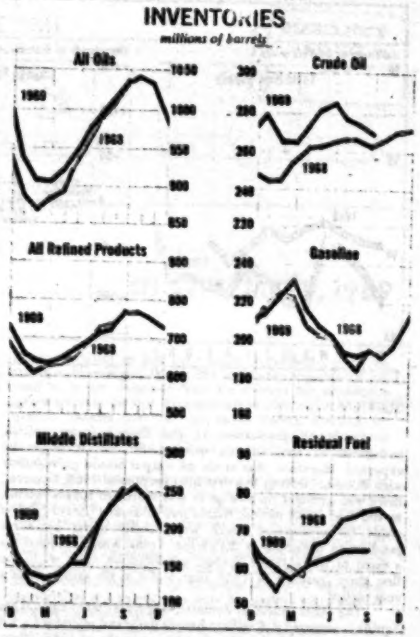
Coal deposits are found in 34 of the 50 states, and economically recoverable reserves of all types are estimated at nearly 800 billion tons. Last year's production rate, therefore, could be maintained for nearly fifteen centuries before existing domestic resources were exhausted. These raw figures, however, tell only part of the story. Bituminous coal reserves will not satisfy needs for anthracite coal, nor is it feasible to fuel utility boilers on the East Coast from coal fields in Colorado. Quality and other economic considerations also trim the real marketability of some deposits, but even so there is positively no question about the adequacy of our national coal supply.

Although reserves are found in many parts of the United States, more than 90 percent of domestic consumption occurs in the North Central and East Coast regions of the country. These areas include the principal coal producing states – Pennsylvania, West Virginia and Virginia in the east, and Kentucky, Illinois, Ohio and Indiana in the central region. The freight element represents such a large proportion of the delivered cost of coal – as much as 40 percent in many cases – that major markets have developed only within a limited distance from production centers. Currently, large new mines are being opened in some of our western states to fuel electric power stations. But, basically, the future for coal continues to lie east of the Mississippi.

There are hundreds of varied uses for coal, oil, natural gas and other fuels. For convenience, they can be grouped into four major markets for primary energy: Industrial-Commercial, Transportation, Electric Utilities, and Residential. The Industrial-Commercial market is by far the largest and accounts for 38 percent of over-all primary energy consumption. It comprises the needs of many diverse forms of economic activity. Among them are heat for large buildings, fuel for industrial processing and such non-energy uses as paving materials and chemical feedstocks.

Second in size are the energy requirements of all forms of land, air and water transportation. They currently represent a quarter of the total. In third place with 22 percent of the market, and growing fastest, are the needs of Electric Utilities for generation purposes. Accounting for 15 percent, the Residential market is the smallest of the four categories. This market includes various uses for energy, but home heating is the primary one.

Coal is consumed in all four energy markets but its volume varies both by market and by region. In the transportation category, for example, coal has been practically eliminated due to changing technology. The railroads began to convert from coal to more efficient oil-burning locomotives in the late thirties. This change was delayed because of other defense requirements during World War II, but the conversion program was resumed in the post-war period. In 1950, nevertheless, almost three-quarters of all locomotives in the country still burned coal and sixty million tons a year were mined for this purpose. As more and more diesel locomotives were brought



into service, this substantial outlet for coal disappeared in a few short years. The coal used for railroad fuel today is burned primarily in the mining regions, and the volume is so small that it is no longer significant. The other transportation usage for coal – fuel for ships – has also been eroded by technological advances. Older vessels, primarily those active in the Great Lakes trade, still consume almost half a million tons of coal annually. But all new ships are powered by diesel or residual fuel oil. As the older coal-burning vessels are gradually retired, therefore, this market will dwindle away, too.

The coal industry has had a similar painful experience in the Residential energy market over the past twenty years. Consumption trends have tended to follow those in the Transportation sector, although the slide has been less pronounced. After World War II, homeowners were attracted toward oil and natural gas for heating purposes. These fuels were slightly more costly but offered excellent burning characteristics and, more importantly, eliminated the unpleasant dust, storage and ash handling problems associated with coal furnaces. This convenience factor coupled with effective marketing techniques by the petroleum industry led to coal's decline.

As recently as 1950, coal was still the dominant fuel for home heating. It served the needs of nearly half the market. But in subsequent years, coal lost this position and currently it provides less than 6 percent of the primary energy used in the Residential market. Natural gas, with a 52 percent share, is the market leader now. Most of the remaining homes heated by coal are located close to the Appalachian and Mid-Western mining regions, and they burn less than twenty million tons per year, or 4 percent of total coal consumption. Many of these homes may be converted to other fuels during the seventies. By 1980, therefore, residential coal consumption is

expected to drop to about half the current level and represent only a very minor share of the over-all market.

The Electric Utility market is by far the most important outlet for coal among the major categories. It accounts for 60 percent of total domestic sales at present and will become proportionally even more important in the future. Last year more than half the electrical power used in the United States was produced in coal-fired generating stations. In certain geographic areas the proportion was even higher. The North Central region, for example, used coal to meet four-fifths of the electric utilities needs. Another important market is the East Coast area where coal accounts for nearly two-thirds of the generation of electricity. Energy consumption by utilities constitutes a very large market, so enormous volumes of coal are involved. In 1968, almost 300 million tons were burned under utility boilers throughout the nation.

The outlook for increased coal consumption by electric utilities is bright. But inter-fuel competition is intense and air pollution restrictions against sulphur or other emissions pose substantial problems for the coal industry in many areas. In the burning process all fuels – coal, oil and gas – release sulphur and other pollutants in varying degrees. Coal, however, has the greatest difficulties in this respect. The industry must hold down the delivered cost of coal and at the same time devise methods to meet more stringent and widespread air pollution regulations if it is to realize in full the opportunities for increased sales to utilities.

Although the Industrial-Commercial market for primary energy is the largest of the four major categories, it ranks only second in importance for coal. Until 1955, coal reigned as the dominant energy source in this market. But in the following years, it was displaced by natural gas, which had become available in substantial quantities and at very low prices. Oil also offered vigorous competition in the Industrial-Commercial market. To an extent, it too was partly responsible for the decline in coal demand.

The Industrial-Commercial market, however, remains an important outlet for coal even though its market share is falling. In 1968, more than 190 million tons, or two-fifths of total coal sales, were made to these customers. Roughly half of this volume was used by the steel industry to produce the coke needed in the steel making process. Growth in the sales of coking coals, however, has tended to be very slow because of progress made by the steel industry in reducing the volume of coke required to produce a ton of steel. Technological improvements have reduced this quantity by fully a third since 1950. During the same period, the use of anthracite and bituminous coal by general industry declined by more than twenty million tons. The drop primarily reflects competition from alternative sources of energy. But it was also the result of mounting public demand for cleaner air. The coal industry has not yet succeeded in developing economically efficient methods to remove air pollutants given off by coal-fired industrial plants. The industry is losing coal customers today and seems likely to lose more in the future unless it can solve this difficult problem.

Coal makes a major contribution to the energy needs of the United States, so it is comforting to view the almost inexhaustible supply of domestic reserves. During the coming decade sales are expected to increase – particularly to electric utilities. In addition, a new future for coal may develop through its conversion to a cleaner, more convenient gaseous or liquid form of energy. Certainly, it will be within our national interest to attempt to utilize our wealth of natural coal resources.

Gerald D. Gunning

Demand	SEPTEMBER 1969 Thous. Bbls. Daily	SEPTEMBER 1968 Thous. Bbls. Daily	SEPTEMBER Change – % –	3 MOS. ENDED SEPT. 30 1969 Thous. Bbls. Daily	3 MOS. ENDED SEPT. 30 1968 Thous. Bbls. Daily	3 MOS. ENDED SEPT. 30 Change – % –	YEAR TO DATE 1969 Thous. Bbls. Daily	YEAR TO DATE 1968 Thous. Bbls. Daily	YEAR TO DATE Change – % –
Gasoline	6,732	6,333	+ 7.5	6,909	6,606	+ 4.8	6,884	6,596	+ 4.4
Kerosine	910	858	+ 6.1	880	826	+ 6.5	938	880	+ 7.9
Distillate	1,700	1,606	*	1,883	1,820	*	2,336	2,268	*
Residual	1,680	1,682	*	1,880	1,881	*	1,949	1,884	*
All Other	3,300	3,304	+ 2.8	3,303	3,264	+ 3.0	3,322	3,078	+ 8.0
Total Demand	13,302	12,868	+ 3.5	13,306	12,918	+ 3.7	14,030	13,436	+ 4.5
New Supply									
Crude Oil Production	9,200	8,934	+ 3.0	9,234	9,078	+ 1.8	9,184	9,110	+ 0.4
Natural Gas Liquids Production	1,575	1,498	+ 5.1	1,587	1,494	+ 4.9	1,583	1,502	+ 5.4
Crude Oil Imports	1,810	1,418	+ 6.8	1,494	1,439	+ 1.7	1,392	1,228	+ 13.5
Residual Fuel Imports	1,041	1,043	– 0.2	1,026	964	+ 6.3	1,203	1,164	+ 3.4
Other Products Imports	413	396	+ 4.6	410	408	+ 0.8	461	390	+ 18.2
Primary Supply	13,729	13,286	+ 3.4	13,660	13,383	+ 2.2	13,823	13,432	+ 2.9
Net Processing Gain	330	329	– 2.7	321	312	+ 2.9	314	311	+ 0.9
Total New Supply	14,059	13,615	+ 3.3	13,981	13,672	+ 2.3	14,137	13,743	+ 2.9
Crude Runs to Stills	10,843	10,412	+ 4.1	10,886	10,622	+ 2.1	10,988	10,311	+ 2.7
	– Million Bbls. –								
Stock Change in Million Bbls.	+ 22.7	+ 21.9	–	+ 57.0	+ 72.5	–	+ 34.3	+ 88.3	–
Stocks—End of Period									
Gasoline	198	199	– 0.2						
Kerosine	51	44	+ 15.5						
Distillate	280	306	– 3.0						
Residual	66	76	– 14.1						
Other Products	299	249	+ 3.6						
Total Products	768	770	– 0.5						
Crude Oil	266	263	+ 2.0						
Total—All Oils	1,034	1,033	+ 0.1						

UNITED STATES PETROLEUM STATISTICS SUMMARIZED

Sources: U.S.B.M., A.P.I., and C.M.B.

*Percentage change not computed as 1969 and 1968 data are not comparable.

THE PETROLEUM SITUATION

RELEASE: NOVEMBER 28, 1969

IN OCTOBER, 1969

DEMAND

With the peak season for gasoline consumption having passed, attention is now focused on the demand for distillate fuel oils. Distillate registered an increase in October in line with the long-term trend. It is probable that most of this gain was brought about by greater use of highway diesel fuel, with only a minor portion of the increase reflecting higher demand for heating oils, even though temperatures during September and October were colder than last year.

Weakness in gasoline and naphtha jet fuel limited the total demand for petroleum to a 3.7 percent gain during October. Gasoline increased only 2.9 percent following exceptional strength last month. The demand for naphtha jet fuel was 42.6 percent below last year. It was the lowest level of naphtha jet demand since February 1966.

Residual fuel oil registered an impressive gain of 7.5 percent. This increase, however, was largely a recovery from an abnormally low level of demand a year ago.

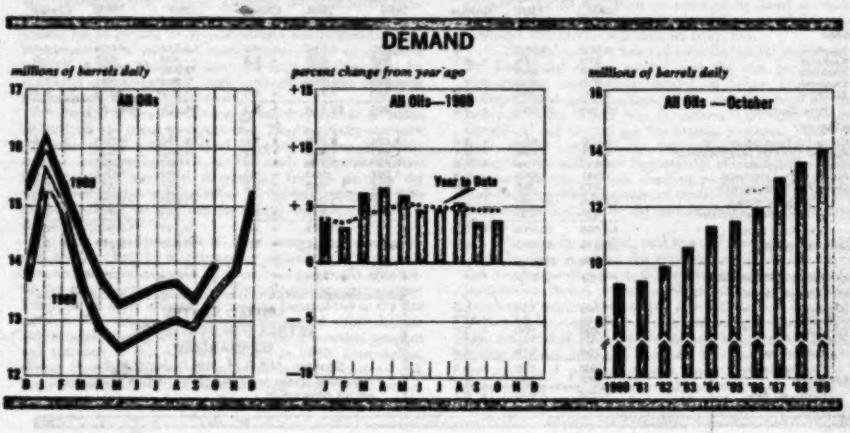
SUPPLY

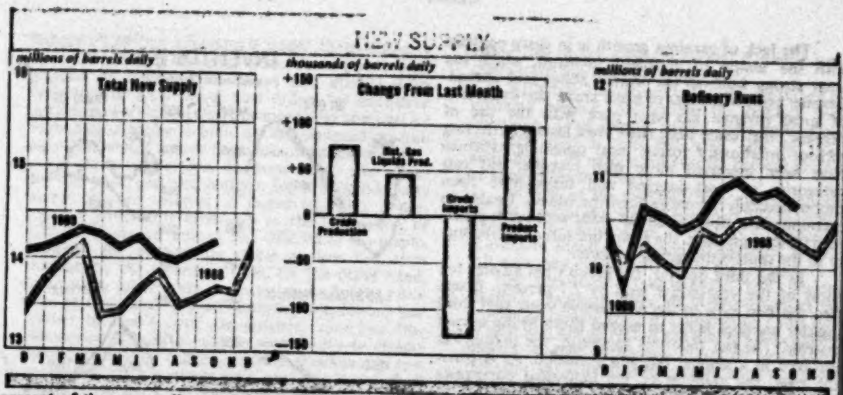
Domestic production of crude oil and natural gas liquids in October averaged 120 thousand barrels a day more than in September. Crude production increased 75 thousand per day primarily because operations in Louisiana returned to normal following the hurricane in August. Despite a higher allowable factor, crude oil output in Texas was virtually unchanged from a month ago. Reflecting seasonal trends, the production of natural gas liquids rose by 45 thousand barrels a day.

Total imports in October were slightly lower than a month ago. Residual imports increased seasonally, offsetting, to a large extent, the decline in crude oil and other refined products. Refinery runs averaged 10.7 million barrels a day during the month—a decline of 158 thousand barrels a day from last month.

INVENTORIES

The amount of crude oil and refined products in primary storage at the end of October was within 1





percent of the year-earlier stock level. At 1.03 billion barrels, the total was 9 million less than a year ago. Gasoline inventories reached 198 million barrels—only 5 million above the year-earlier level. Kerosine stocks, at 50 million barrels, were also 5 million higher than a year ago and are regarded as somewhat excessive. The excess reflects a rate of demand that has fallen below expectations. Distillate inventories, amounting to 207 million barrels, were down from the year-earlier level by 5 million. There was a larger decline for residual fuel of 11 million barrels. At 66 million barrels, however, residual stocks were in a better position relative to requirements.

PRICE

In the highly volatile Mid-Continent gasoline market, prices rose ½ cent a gallon in October. Added to last month's ¼ cent increase, the gains represented a partial recovery from the decline in August, when prices fell a full cent a gallon. Despite the increase in the Mid-Continent, gasoline prices at the end of the month were generally below the levels of recent years. The East Coast was the only major wholesale gasoline market in which posted prices were not under the levels of two years ago. In the Gulf Coast area, wholesale gasoline prices declined ¼ cent a gallon. They are now ¾ cent a gallon below their summer peak.

In contrast to gasoline prices, distillate postings in all major markets at least equalled the levels of one and two years ago. They moved up ¼ cent a gallon in Chicago but down by the same amount in the Mid-Continent. The decrease in the Mid-Continent, despite sharply lower temperatures in many Midwest states, was regarded as recognition of common discounting rather than new price softening. Kerosine prices also compared favorably with the levels of recent years, except at the Gulf Coast. In that market, kerosine was priced a full cent below a year ago. And even kerosine jet fuel was available for less than the price of regular grade kerosine last year. But in the Chicago market, kerosine prices increased ¼ cent a gallon to a level ½ cent above a year ago. The wholesale price of residual fuel advanced 5 cents a barrel on the West Coast.

G.J. Shuttlesworth

INTERNATIONAL OIL

During the first nine months of this year, demand for oil in the Free World averaged about 37 million barrels a day. This was a gain of 8 percent over the same period last year. In the U.S., demand rose by 5 percent, and in the foreign sector, requirements increased 10 percent.

Reflecting the expansion in demand, Free World crude oil production registered a 7.7 percent gain—right in line with the long-term trend. Most of the 2.4 million barrel a day growth was in the Free Foreign areas. In fact, two-thirds of this volumetric increase was concentrated in Libya, Iran, and Nigeria, each country contributing about 500 thousand barrels a day to the total gain. The Nigerian increase, of course, reflects a recovery from the effects of last year's Civil War. But Libya and Iran were the scenes of actual growth. In Libya, an all time high of almost 3.1 million barrels a day was attained during the nine month period.

The growth of oil production in other countries varied widely. Saudi Arabian production dropped slightly in the first half of 1969. But in September, it hit a record 3.2 million barrels a day with the result that output in the third quarter averaged more than 3 percent above the level reached in the same period last year. In Egypt and Indonesia, the January-September period saw very large gains—45 percent and 26 percent, respectively. But in Venezuela, production averaged 1.5 percent below the 1968 level. And in the United States, it registered a mere 0.2 percent rate of growth.

S.I. Semos

EARNINGS

In the first nine months of 1969, the combined net income of the large group of petroleum companies this Bank has under continuous survey fell slightly behind the earnings recorded in the same period last year. It was the only time since 1958 that the group has failed to achieve a growth in earnings. Because 1958 was marked by a rather severe business recession, some petroleum industry sources have been prompted by the earnings performance this year to wonder if the nation might not be experiencing another recession.

The lack of earnings growth is in sharp contrast with the tempo of petroleum demand, which has been strong both in the United States and abroad. Despite price weakness in some areas, the expansion of gross revenue has kept pace with the rise of demand. But costs have risen even faster. Reflecting various inflationary forces, most operating expenses have been increased more than revenue. But two categories of cost—interest and taxes—have risen proportionately far more than the others. Unable to accommodate all its financial needs with funds generated from operations, the group has turned increasingly to the short-term capital markets.

In the third quarter, the group's net income fell short of the year-earlier level by 2.7 percent. It was also the first time in the past twelve years that third quarter earnings failed to exceed those of the second quarter. The last time this happened, the nation was involved in a general business recession. As is often the case, the earnings of the individual companies varied substantially from the average performance of the group as a whole.

Richard C. Sparling

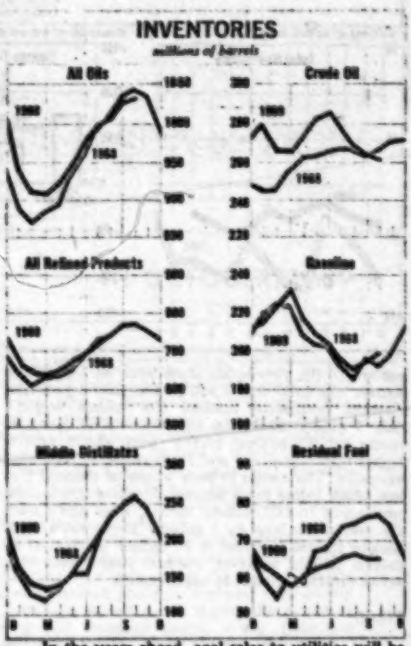
THE STORY OF COAL – PART II

The nation's requirements for primary energy in the next decade will be enormous and domestic reserves of petroleum—both oil and natural gas—are likely to be inadequate to support the potential demand. But, as was pointed out in last month's report, there is no need for concern in regard to coal. The real challenge is to devise economic methods to utilize more fully this nation's abundant coal deposits.

Consumption of solid fuels in the Transportation and Residential Markets has been declining for years and this trend is expected to continue. Although some growth is expected for coal in the Industrial-Commercial Market, gains are likely to be minor. The electric utilities, however, constitute the most important outlet for coal and will continue to do so in the future. The oil equivalent of nearly seven million barrels per day of all types of energy was used to generate electricity last year, and utility requirements will more than double by 1980. Coal is the source of more than half of this energy.

Many generating stations are designed to burn more than one form of fuel—coal, oil or natural gas—and can switch from one to another when economic considerations dictate a change. The coal industry must continue, therefore, to hold down costs and improve technology if it is to retain a competitive position. A new threat to coal's dominance—nuclear energy—will also have a significant impact in the Electric Utility Market in the years ahead.

Each major region of the United States provides a different pattern of utility fuel usage. In the Gulf Coast area, for example, most utilities use low-cost natural gas from nearby fields to generate electricity. On the West Coast, water power from hydro-electric sites provides almost sixty percent of all the energy needed. But on the East Coast, coal is the source of nearly two-thirds of the energy used for generating purposes. And in the largest regional market—the North Central area—coal represents more than three-fourths of the primary energy utilized by utilities.



In the years ahead, coal sales to utilities will be influenced by different factors in each region. On the West Coast, the limited potential for expansion of hydro-electric capacity is a factor favorable to coal. Western utilities are turning to coal deposits in Wyoming, Utah, Arizona and New Mexico to meet part of their expanding requirements. Twelve new coal-fired generating stations with a combined capacity of 4.5 million kilowatts are already under construction in these states, and others are planned. These large coal plants each consume the oil equivalent of 25,000 barrels per day. Power produced in these plants will be transmitted along extra-high voltage transmission lines for hundreds of miles to centers of consumption in the West Coast region. Currently, the coal used to generate electricity for the West Coast amounts to less than ten million tons. But, by 1980, consumption is expected to reach 70 million tons.

Another development of potential benefit to coal in the East Coast and North Central regions is the probability that domestic natural gas will be in short supply within a few years. Because utilities pay less for their energy than do other users, the natural gas that is available is likely to be channeled into more profitable markets. As a result, many electric utilities may be forced to turn, at least in part, to coal to make up the deficit.

There is another side to the coin, however. The rapid introduction of nuclear power in several areas, will restrict the growth of coal markets. Electric utilities at present have only 3 million kilowatts of nuclear generating capacity in operation, but a

further 67 million kilowatts is under construction or on order. During the past year, these plants were plagued by construction delays and sharply rising capital costs. As a result, new orders for additional nuclear power stations have dropped very sharply. An expanding capacity to build nuclear powered generating plants should relieve the bottlenecks, however.

Substantial uranium discoveries have also occurred this year, and the outlook for a fully adequate supply of ore reserves is improved. This factor, together with rising efficiency in the production of kilowatt hours per unit of fuel utilized in the plants, increases the chances for stable nuclear fuel costs throughout the seventies. Coal, on the other hand, faces rising labor costs in many areas. Safety problems at the mines and air pollution regulations add further to coal's cost. On balance, therefore, the economics of nuclear power seem likely to remain favorable in many regions, and the slowdown in new orders for nuclear plants may prove to be of short duration. In the East Coast region, coal faces strong competition from residual fuel oil as well as from nuclear power. And within the past year coal has suffered some reverses. Several East Coast states north of Washington D.C., in an effort to combat air pollution, have imposed severe restrictions on the sulphur content of fuels burned by electric utilities. The petroleum industry has thus far managed to meet the new fuel standards with little change in delivered prices, but the coal industry has been less successful. The result has been a significant switch from coal to oil that has reduced utility coal consumption and, more important, weakened prospects for new coal-burning generating plants in these states. Because it is not yet practical to desulphurize coal, the coal industry must develop other means to reduce sulphur emissions from coal-fired stations—perhaps by the use of devices to remove pollutants from the stack gases. Alternatively, the industry may be able to bring large new deposits of low-sulphur coal into production. In either case, quick action is needed if similar losses in other states are to be avoided.

Although the prospects for coal are mixed in the different regions, nationwide the outlook remains favorable. Total electric utility consumption of coal was 300 million tons last year, and by 1980 an additional 120 million tons—forty percent more—will be needed for this market.

In view of the outlook for domestic supplies of oil and natural gas, serious consideration must also be given to the conversion of coal to a cleaner, more convenient liquid or gaseous energy form. Progress in this area may conceivably allow coal to regain a share of the important Transportation and Residential Markets. Renewed sales to these customers would provide greater utilization of the nation's vast reserves of coal and would reduce the nation's dependence on foreign sources of energy. Research on conversion methods has demonstrated that existing technology is adequate to do the job, but costs must be reduced further if gas or liquids produced from coal are to be competitive with the natural products.

To achieve this aim, the coal industry will have to spend substantial amounts of capital and engage in projects of enormous scale. Large commercial-size plants to produce coal liquids or pipeline quality gas are expected to cost more than $300 million each and require up to twenty million tons of coal per year. The mining part of such a venture alone, will require production two to three times greater than the output of the largest coal mine operating in the United States today.

The outloook for increased sales of coal to existing markets is good during the coming decade, despite mounting competition. And the future is potentially even more promising when the possibilities of converting coal to gas and liquids are considered.

Gerald D. Gunning

Energy Economics Division November 28, 1969

	OCTOBER			3 MOS. ENDED OCT. 31			YEAR TO DATE		
	1969	1968	Change	1969	1968	Change	1969	1968	Change
Demand	Thous. Bbls. Daily		— % —	Thous. Bbls. Daily		— % —	Thous. Bbls. Daily		— % —
Gasoline	6,857	6,486	+ 2.9	6,789	6,541	+ 4.8	6,808	6,548	+ 4.8
Kerosine	972	987	+ 0.4	912	857	+ 6.3	922	894	+ 7.8
Distillate	2,116	2,014	+ 5.1*	1,839	1,806	+ 1.8*	2,216	2,233	+ 3.7*
Residual	1,810	1,683	+ 7.5*	1,729	1,605	+ 7.5*	1,864	1,804	+ 4.8*
All Other	3,418	3,281	+ 1.0	3,404	3,303	+ 3.4	3,380	3,112	+ 4.8
Total Demand	13,970	13,671	+ 2.7	13,670	13,112	+ 4.3	14,080	13,436	+ 4.7
New Supply									
Crude Oil Production	9,276	8,917	+ 4.0	9,177	8,884	+ 3.0	9,177	9,127	+ 0.5
Natural Gas Liquids Production	1,620	1,514	+ 7.0	1,591	1,499	+ 6.1	1,588	1,503	+ 5.7
Crude Oil Imports	1,364	1,481	— 6.6	1,448	1,431	+ 1.2	1,391	1,252	+ 11.1
Residual Fuel Imports	1,200	1,051	+ 14.2	1,116	978	+ 14.0	1,220	1,182	+ 3.9
Other Products Imports	356	402	— 11.4	420	387	+ 8.5	460	391	+ 17.6
Primary Supply	13,836	13,365	+ 3.5	13,751	13,189	+ 3.5	13,837	13,426	+ 3.1
Net Processing Gain	340	348	— 2.3	324	326	— 0.3	317	315	+ 0.6
Total New Supply	14,176	13,713	+ 3.4	14,075	13,514	+ 3.4	14,154	13,740	+ 3.0
Crude Runs to Stills	10,589	10,206	+ 3.7	10,776	10,436	+ 3.2	10,809	10,311	+ 2.8
	— Million Bbls. —								
Stock Change in Million Bbls.	+ 6.4	+ 9.1	—	+ 37.8	+ 80.8	—	+ 33.2	+ 97.4	—
Stocks—End of Period									
Gasoline	199	192	+ 2.9						
Kerosine	50	48	+ 13.1						
Distillate	307	212	+ 3.3						
Residual	65	77	— 14.9						
Other Products	251	248	+ 1.0						
Total Products	772	775	— 0.5						
Crude Oil	261	266	— 1.9						
Total—All Oils	1,033	1,041	— 0.8						

UNITED STATES PETROLEUM STATISTICS SUMMARIZED

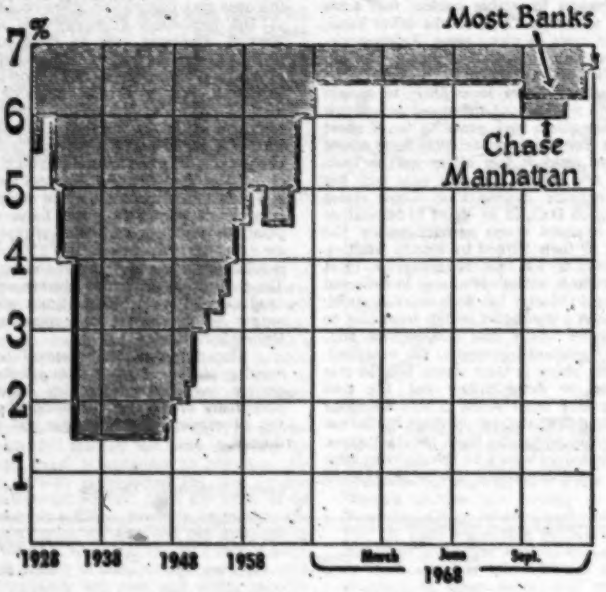
Sources: U.S.B.M., A.P.I., and C.M.S.

*Demand in 1969 and 1968 not strictly comparable.

DEFENDANT'S EXHIBIT 218

PRIME INTEREST RATE

1928 - 1968



Source: Chicago Daily News (Business and Finance Section), Page 49, December 18, 1968

ELECTRIC ENERGY, INC.
POST OFFICE BOX 165
JOPPA, ILLINOIS 62953

DEFENDANT'S EXHIBIT 219

March 9, 1970

Mr. Reuben L. Hedlund
Kirkland, Ellis, Hodson, Chaffetz & Masters
Prudential Plaza
Chicago, Illinois 60601

Re: United States v. General Dynamics Corporation, et al., Civil Action No. 67 C 1632 (N.D. Ill.)

Dear Mr. Hedlund:

This letter will confirm the substance of our telephone conversation of many months ago, at which time we discussed my letter dated November 14, 1966 to the Department of Justice in response to their letter concerning the above litigation.

In that letter, you will recall, we cautioned the Department of Justice not to infer from our letter that Electric Energy, Inc. considered the acquisition of the United Electric Coal Companies by General Dynamics Corporation to be in the category of mergers which might lead to a narrowing of the "spot" market for us and tend to increase our fuel costs. When you inquired further in our initial phone conference, I advised you that Electric Energy, Inc. did not think that the United Electric-Freeman merger would have any impact on our "spot" market and did not think that it would in any way adversely affect the competition for our business. As I pointed out to you at that time, the location of Electric Energy, Inc.'s generating station on the Ohio River is such that coal produced in the Belleville freight rate district where United Electric's Fidelity mine is located could not be shipped to us at that time on a competitive basis with coal produced in the Southern Illinois and West Kentucky districts. This was true at that time regardless of whether the coal had been offered on a contract or spot basis. Because of the freight rate disadvantage, Belleville producers are not able to compete at this time for our business unless we were to be given the advantage of a unit train movement rate, not presently existing.

In my letter to the Department of Justice I was attempting to point out to them that Electric Energy, Inc. would be concerned about mergers between producers located in the Southern Illinois and West Kentucky freight rate districts - areas from which we secure our coal.

In view of your indication to me last week that my letter of November 14, 1966 is being introduced into evidence in the law suit, I am happy to write this letter to make our position perfectly clear in this regard.

Yours very truly,

V. H. Clark
Secretary-Treasurer

VHC/sj

DEFENDANT'S EXHIBIT 220

June 29, 1942

Mr. B. L. Slack
Box 1934
Tuscon, Arizona

Dear Sir:

We are not interested in operating any coal mines except strip coal mines. For our purposes the coal must be under not over 70 feet of overburden. If any of your coal is of this type, let me know.

Yours very truly,

President.

FFK:F

DEFENDANT'S EXHIBIT 221

July 23, 1954

Mr. Herman G. Schenck
801 East Water Street
Princeton, Indiana

Dear Mr. Schenck:

Thank you for your letter of July 19, informing us about the Fort Branch Coal Field.

Inasmuch as we confine our operations to strip mining, we would not be interested in this property.

Very sincerely yours,

President

DEFENDANT'S EXHIBIT 222

June 11, 1956

Mr. Nye F. Morehouse, Special Counsel
Chicago and North Western Railway System
400 West Madison Street
Chicago 6, Illinois

Dear Mr. Morehouse:

Thank you for your letter of June 7 regarding Superior Coal Company.

Our operations are all strip operations, and we are not considering mining deep coal at the present time.

Very sincerely yours,

President

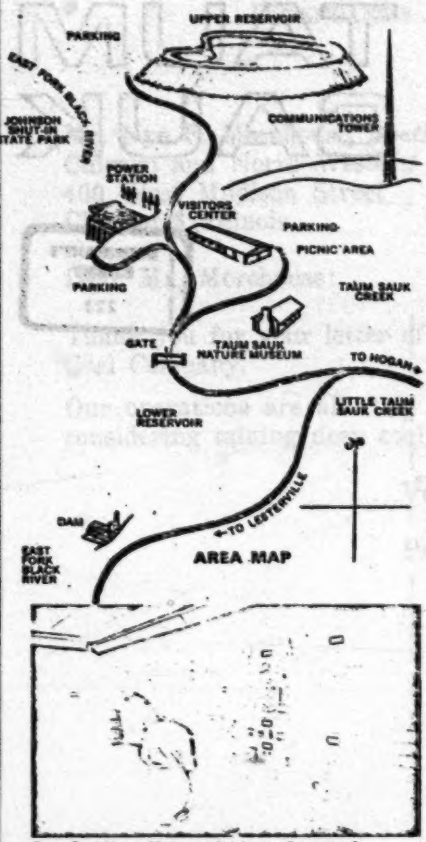
TAUM SAUK

POINTS OF INTEREST

- Petroglyphs—Indian rock carvings in Washington State Park, 10 miles south of De Soto, Mo.
- Moses Austin Resting Place—Potosi, Mo.
- Restored Historic Cabin—Potosi, Mo.
- Mineral Museum—Flat River, Mo.
- Elephant Rocks—Graniteville, Mo.
- Fort Davidson, Pilot Knob Mt., Pilot Knob, Mo.
- Civil War Statue, commemorating site where Ulysses S. Grant was appointed Brigadier General—Ironton, Mo.
- Statues from St. Louis World's Fair of 1904 at home of Chanticleer Ceramics—Ironton, Mo.
- Lake Killarney—4 miles east of Ironton on Hi. 72
- Millstream Gardens—10 miles east of Ironton on Hi. 72
- Taum Sauk Mountain—1772 ft. above sea level; highest point in Missouri
- Johnson Shut-In State Park—Road M near Lesterville, Mo.

DEFENDANT'S EXHIBIT 223

UNION ELECTRIC COMPANY
315 N. Twelfth Blvd., Saint Louis, Mo. 63166



Taum Sauk Nature Museum adjoining the Reception Center exhibits natural resources of the state of Missouri. Displays of geological formations, wood and clay resources and their end products, birds and wild flowers, mammals, etc. are included at the museum.

Union Electric Welcomes You!

A by-product of hydroelectric power stations is the opening up and improvement of certain areas that have recreational potential. It is our policy to make the most of that potential for the benefit of the public. This is in keeping with our responsibility as supplier of an essential public service.

You are welcome to enjoy the facilities we have installed to make your visit more comfortable and to provide access to points of interest. We are doing all we can, within the bounds of safety and economy, to conserve and enhance the forests, waters, fish and wildlife that together make the area appealing to you. We ask that you cooperate.

Taum Sauk is the pumped-storage hydro plant of the Union Electric Company, a business managed, investor owned utility serving over 2,300,000 people in Missouri, Iowa and Illinois.

Taum Sauk is one of the few and one of the largest plants of its kind in the world. The Taum Sauk plant serves a special purpose in the power supply of Union Electric, an electric system on which a variation of only seven degrees of daytime summer temperature can cause a load change of as much as the entire capacity of this plant. Pumped hydro is ideally suited to this type of service. A pumped hydro plant is not dependent upon rainfall, since the water required to operate it as a generating plant is pumped into the high elevation lake by its own hydroelectric equipment. Pumping is performed by the simple reversal of rotation of the generating units. Power for this pumping comes from the excess steam turbine generating capacity available at night and over the week ends when the use of electricity by customers is greatly reduced. For each three cheap night kilowatt hours used for pumping, two daytime KWH are returned when they are much more valuable. In addition, the Taum Sauk plant is an important reserve for emergencies.

The rock walls of the upper pool rise 84 feet above the reservoir floor and are concrete lined. They are topped by a 10-foot high parapet wall to permit additional storage of water. The floor is paved with asphalt and covers 39 acres. This reservoir will hold a billion

and a half gallons of water weighing some five million tons, and is 55 acres in area at the top.

Water flows from this upper reservoir down through a vertical shaft 431 feet deep and then races another 400 feet down hill through a tunnel, 6,600 feet long. The lower 1,800 feet of this tunnel is lined with steel tubing 18½ feet in diameter, which carries the water out of the mountain and down to the turbines. From the turbines it passes on into the lower lake. During pumping, this flow is reversed and the water is restored to the upper lake.

The lower lake spreads over nearly 400 acres, and is formed by a small dam across the East Fork of the Black River, which contributed the water for the initial filling and provides a very small amount of water for evaporation and seepage. During generation, the elevation of this lake rises 15 feet in eight hours, and when pumping it drops by the same amount in twelve hours. Level gauges, and automatic valves in this dam, maintain the total volume of water in the two lakes at an amount equal to that of the lower lake when full. In this manner the natural inflow to the lower lake is at all times automatically passed on down stream, except during high flood when some variations may occur.

The Taum Sauk plant has an output rating of 350,000 Kw. Operation is automatic, remotely controlled from the Osage plant and from the Dispatchers' office in St. Louis. The cost of the plant was approximately $50,000,000 and it went into service in the summer of 1963.

We hope that you enjoy your visit and ask you to help us keep the area unlittered so that those who come after you may enjoy their stay.

LOCATION: In Ozark Highlands near Lesterville, Mo. (Reynolds County), 90 airline miles southwest of St. Louis.

COMPLETION DATE: August, 1963.

COST: $50,000,000 (includes $10 million for transmission lines).

CAPACITY: 350,000 Kilowatts

NIGHT PUMPING CYCLE: About 9½ hours, using power at rates up to 400,000 kilowatts.

DAY GENERATING CYCLE: Capable of producing 2,750,000 kilowatt hours of energy. Normal full use expected to be about 2,200,000 kwh daily, leaving 25 per cent emergency reserve.

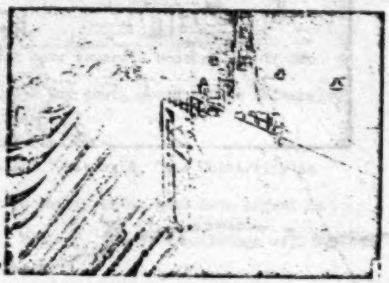
UPPER RESERVOIR: Man-made lake atop a 900-foot mountain, covering an area 55 acres and 92 feet deep, holding 4,350 acre feet of water (8 times the water consumed daily in St. Louis).

LOWER RESERVOIR: A 395-acre pool created by a concrete dam, 60 feet high and 390 feet long, on the East Fork of the Black River, and holding 6,350 acre feet of water. Maximum drawdown during night pumping: 16 feet.

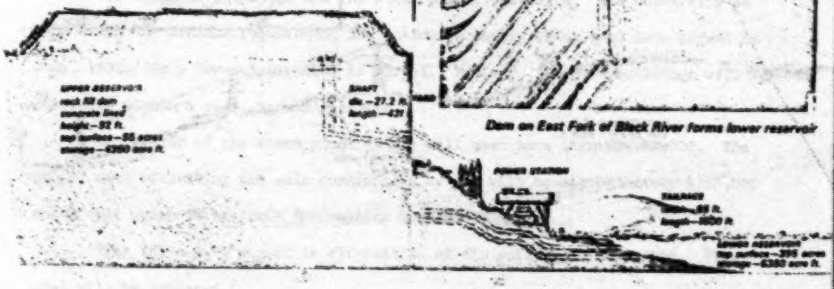
SHAFT AND TUNNEL:
7,003 feet long, 27.2 feet in diameter at shaft, 25.5 feet in diameter at upper reach, 18.5 feet in diameter at lower reach. Difference in elevation between upper and lower reservoirs averages about 800 feet.

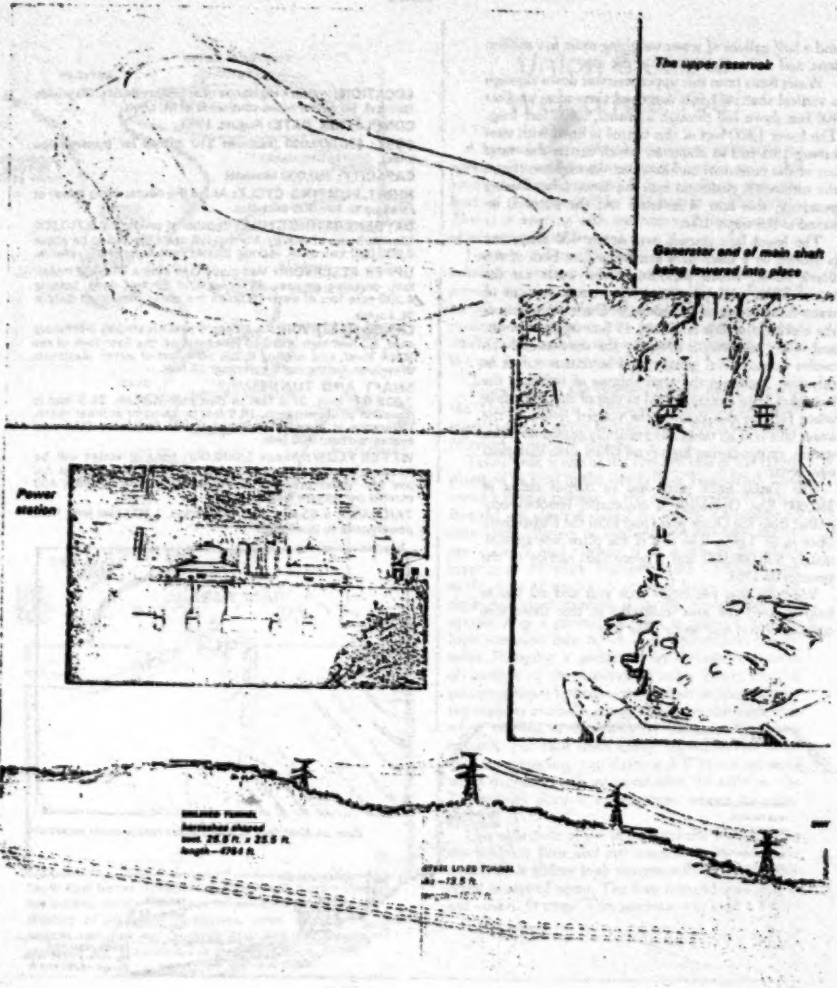
WATER FLOW: About 5,000,000 tons of water will be handled in each direction during the cycle of a normal full use day. Water pressure at the power station is about 400 pounds per square inch.

TAILRACE: A 65-foot wide excavation, 1,500 feet long from powerhouse to lower pool.



Dam on East Fork of Black River forms lower reservoir




The upper reservoir
Generator and of main shaft being lowered into place
Power station

THE UNIVERSITY OF CHICAGO
Office of Public Information
Chicago, Illinois 60637
Midway 3-0800, Ext. 4421

70-20
1-19-70

Contact: Stuart Kaminsky
Ext. 4472

DEFENDANT'S EXHIBIT 224

FOR RELEASE: P.M. MONDAY, JANUARY 19, 1970

By 1971, no University of Chicago buildings in the Hyde Park-Kenwood area will be heated by burning coal.

This will complete a conversion program begun in the fall of 1967 to help solve the air pollution problem.

The announcement was made today (Monday) by Gilbert L. Lee, Jr., Vice-President for Business and Finance.

According to Lee, the University owns 236 buildings in the area. A total of 118 of these are heated by the University's steam plant at East 61st Street and South Blackstone Avenue. By September, 1970, the steam plant will be using only gas and oil, not coal.

A total of 95 University buildings which have separate heating plants are now heated by gas or oil. Only 22 buildings, 9.7 per cent, owned by the University are still heated by coal.

"In those 22 buildings and the steam plant," Lee said, "the University is well below the minimum requirement for pollution safety which goes into effect in July, 1970. Only low-sulphur coal is burned. However, those 22 buildings will be converted within a year, possibly sooner."

Conversion of the steam plant to gas will cost more than $2,000,000. The annual cost of heating the main quadrangles by gas will be approximately $250,000 above that which it has cost for heating by coal.

"The University's goal is elimination of air pollution," Lee said. "That goal will be achieved."

# # #

SMK:lh

GENERAL DYNAMICS CORPORATION

DEFENDANT'S EXHIBIT 225

May 25, 1960

Robert A. Bicks, Esq.
Acting Assistant Attorney General
Antitrust Division
Department of Justice
Washington 25, D. C.

Dear Mr. Bicks:

This is a further reply to your letter dated January 29, 1960 to Mr. Earl D. Johnson, President of General Dynamics Corporation, requesting certain information relating to the merger of Material Service Corporation with and into General Dynamics.

We have previously submitted material in connection with Item Nos. 1, 5, 7, 8, and 9 of your letter. I am enclosing herewith the following:

Exhibit A - A summary of the minutes of each meeting of the Board of Directors of General Dynamics Corporation at which the Material Service merger was discussed. (Item No. 2 of your letter.)

Exhibit B - A list setting forth each merger and acquisition by General Dynamics and by companies it has acquired during the period from January 1, 1953 to date. (Item No. 3)

Exhibit C - Copies of statements submitted to stockholders and filed with certain government agencies in connection with such mergers and acquisitions. (Item No. 4)

Schedule II - A schedule setting forth the total value of sales by General Dynamics of its principal products for each year since 1955. (Item No. 6)

COPY

In answer to Item Nos. 10 and 11 of your letter, General Dynamics Corporation had no plans at the time of themerger to use the products and facilities of the Material Service Corporation in its business as it then existed, and at such time there were no plans to use the products and facilities of General Dynamics Corporation in the business of the Material Service Corporation. Since that time the Liquid Carbonic Division of General Dynamics Corporation has supplied Material Service with a portion of its oxygen and acetylene requirements, which are a very minor part of the principal business of the Material Service Division.

In response to Item No. 12, prior to the merger there had been no business transactions between General Dynamics Corporation and Material Service Corporation.

In response to Item No. 13 of your letter, we are submitting a copy of a letter dated November 24, 1959, from Mr. Frank Pace, Jr., Chairman of the Board of General Dynamics Corporation, to the share owners of the Corporation outlining the factors which entered into the decision to merge with Material Service Corporation.

This completes the material submitted in response to your letter. If you have further questions in this connection, please direct them to Mr. Roger I. Harris, Vice President and Chief Counsel of the Corporation, in whose absence I am signing this letter.

Very truly yours,

Ward B. Chamberlin, Jr.
Office of Chief Counsel

WBC, Jr.:dw

encs.

cc: Roger I. Harris, Esq.
Henry M. Marx, Esq.

EXHIBIT C

This Exhibit is submitted in answer to Item 4 requesting "a copy of each statement submitted to stockholders or filed with the Securities and Exchange Commission, stock exchanges, or other public agencies, state or federal, by your company and by each acquired company (except HSC) concerning each merger and acquisition listed in response to the first part of Item 3."

In connection with the mergers and acquisitions of General Dynamics Corporation from January 1, 1953 to date as listed in Exhibit A, the following documents are attached hereto:

Consolidated Vultee Aircraft Corporation

Proxy Statement dated March 26, 1954
SEC Form 8-K for April 1954
New York Stock Exchange Listing Application dated April 30, 1954

Stromberg-Carlson Company

Proxy Statement dated June 1, 1955
SEC Form 8-K for June 1955
New York Stock Exchange Listing Application dated July 1, 1955

J. B. Beanblin Electronics

New York Stock Exchange Listing Application dated September 23, 1955

Electronic Control Systems, Inc.

New York Stock Exchange Listing Application dated September 23, 1955

The Liquid Carbonic Corporation

Proxy Statement dated August 30, 1957
SEC Form 8-K for September 1957
New York Stock Exchange Listing Application dated October 1, 1957

Industrial Air Products of the South

New York Stock Exchange Listing Application dated December 2, 1958

Material Service Corporation

Proxy Statement dated November 24, 1959
Letter to share owners dated December 7, 1959
SEC Form 8-K for December 1959
New York Stock Exchange Listing Application dated December 29, 1959

DEFENDANT'S EXHIBIT 227

November 1, 1963

Mr. R. J. Hepburn:

Re: Kerr Coal Company

In the afternoon of October 29, Mr. Jerry Swanson of the Freeman Coal Company and I visited the Kerr mine. We both went down into the mine and remained there approximately two hours. Mr. Swanson took measurements and checked the roof bolting and the bony sections of the coal, and he possibly will give a more complete report in the very near future.

We obtained a mine map and pinpointed their present workings. However, my impression—although I am not experienced in this type of mining—is that the problems are not insurmountable.

As pointed out in the Joy report, this is a very hard sandstone. There is no definite way of plotting their patterns. However, economical mining could be done. I feel that possibly one of the reasons for the poor report from Joy is that their type of machines are not readily adaptable to these conditions. If a forecast of the location of these sandstone formations could be made, planning could forecast them and a more productive mining situation could be had.

I got the impression in the mine that the men were somewhat lackadaisical, and poor management is one of the main problems. I can see no reason why this could not be a better-cost, more-profit mine than it is at present.

I understand at this time that the Kerr Coal Company is taking penalties because of their B.T.U. requirements. This quite possibly could be due to the fact that the coal loaders in the deep mine do not spearate the rock efficiently. A jig could be set up to do this. The present equipment would probably have to be abandoned and new equipment required: trackage, etc.

I talked to Mr. Kerr relative to the sampling that they do to check the quality of their coal. They have a belt sampler. However, analyses are taken only once a

week, and they have the same problem we have here—comparative analysis between the power company and the coal company.

I would like to add that I feel that Mr. Swanson of Freeman is going to give a much more favorable report than that handed to us by Joy. I let him read the Joy report. He readily agreed with me that this was not a very true picture. I pointedly asked him if he had this mine, could he profitably run it. He said he would jump with joy at the opportunity.

/s/ R. H. Inman
R. H. INMAN

RHI:LJ

DEFENDANT'S EXHIBIT 228

Mr. Morris outlined the need for additional stripping equipment at the Fidelity Mine. Present equipment will maintain current production rate in the present pit for approximately eighteen months, at which time, with deeper overburden, the 1650-B would need help to maintain production of approximately 180,000 tons per month.

After mining all of the coal in the present location (Green Pit), the estimated reserves at Fidelity that can be stripped is 23,000,000 tons. This is located in three different areas and shows overburden depths, rock and surface material that would require a machine to help the 1650-B to mine it all out economically. Without a helper, monthly production would be reduced from its current rate of 180,000 tons to approximately 125,000 tons, with resultant cost increase. Also, of this 23,000,000 tons, approximately 10,000,000 could not be mined at all with the one machine (1650-B). The need for additional help is thus established as necessary.

Mr. Morris stated that after thorough investigation, a wheel, properly designed for the particular areas involved, seemed to be the best solution.

The following information and estimates have been developed.

1. Bucyrus-Erie has a standard design and has built a wheel for Peabody and one for Truax. It is high enough for us, but for our purpose certain modifications of design seem necessary. They put a price on their standard design of $2,500,000, and an estimate on transportation and erection of $[illegible]00,000.

While we don't know exactly what the change in design we would need would cost, they have indicated that the engineering and other factors involved would cost somewhere in the neighborhood of another $1,000,000. So it appears we are thinking about something over $3,000,000 for a Bucyrus machine properly designed and in place, ready to operate.

2. We have built four wheels, three of which are now in operation. The W-2 is at Buckheart, the W-3 at Banner, and the W-4 at Cuba. The W-3 was originally at Fidelity Mine but the design of this particular machine did not properly serve the need at that mine and it was not successful there. It was redesigned and moved to Banner and our cost and profit record there will indicate its satisfactory performance.

   The wheels at both Buckheart and Cuba are doing a satisfactory job.

3. We have all of the engineering information and blue prints necessary to build the type of wheel we need at Fidelity. This is quite a cost saving.

   The machine would be built higher, the digging end longer, and the stacker end some longer and higher to place the dirt back far enough in deep overburden to avoid slides. We would use the base, motors and quite a lot of other material from the 5561 Marion shovel which is now a stand-by at Fidelity.

4. Utilizing our engineering knowledge, blue prints, and experience, and building the machine on the site, would effect considerable savings. The repair parts in inventory for the 5561 and also repair parts in inventory for Wheels 2, 3 and 4 would be available for the W-5 machine.

5. Our estimate of the total cost, using our own people for the engineering and supervision, and contracting for the welding, erection and so forth, is $1,800,000. We feel our estimates are within reason and have included in the above figure $200,000 for contingencies and unexpected difficulties.

In our five-year budget for capital expenditures, we included $250,000 in 1966 and $1,750,000 in 1967.

We can build this machine and have it in operation within fourteen months. The best estimate from Bucyrus is eighteen months and probably longer.

After discussion, upon motion duly made by Mr. Nugent, and duly seconded by Mr. Thorson, the following resolution was unanimously adopted:

> RESOLVED, that management be authorized to proceed with the necessary purchasing and contractual arrangements to build Wheel No. 5 for use at the Fidelity Mine at a cost of not to exceed $1,800,000.

The Chairman then stated that the next order of business was consideration of the payment of a dividend. He presented a certificate by Mr. John T. Murray, Treasurer of the Company, in respect of the Company's current financial condition and related matters, and stated that such certificate would be made a part of these minutes.

After discussion, upon motion duly made by Mr. Thorson, and duly seconded by Mr. Ames, it was unanimously

> RESOLVED, that a regular dividend of forty-five cents (45¢) per share on the common stock of this Company be and the same hereby is declared, payable on the 9th day of September, 1966, to stockholders of record at the close of business on August 24, 1966.

There being no further business, on motion duly made by Mr. Thorson, and duly seconded by Mr. Gebhart, the meeting was adjourned.

J. T. Murray
Secretary

DEFENDANT'S EXHIBIT 229

Form Number 250

PLEASE SEE ENCLOSED INSTRUCTIONS BEFORE COMPLETING QUESTIONNAIRE

1. Company and address (please include zip code) Freeman Coal Mining Corporation
307 North Michigan Avenue
Chicago, Illinois 60601

2. Name & title of officer supervising compliance with subpoena M. J. Proper
Administrative Vice President

COAL RESERVE ESTIMATE

The estimated tonnage should include all coal owned in fee, under lease or optioned by your company and any subsidiary, affiliate, division or nominee as of the most recent compilation. Only reserves located in mining districts 9, 10 and 11 (Illinois, Indiana or West Kentucky) need be shown.

3. COAL RESERVES DEDICATED TO EXISTING MINES:

NAME OF MINE	Estimated Strip Tonnage (Tons)	Estimated Deep Tonnage (Tons)	Percentage of Recovery Used for Estimated Tonnage	
			Strip	Deep
Crown		20,719,552		50.00%
Orient No. 3		33,532,320		74.42
Orient No. 4		5,315,408		74.42
Orient No. 5		34,035,600		74.42
Orient No. 6		55,730,400		74.42
Total Tons:		149,333,280		

4. OTHER COAL RESERVES (owned, leased, or optioned by your company or any subsidiary, affiliate, division or nominee, as of most recent compilation, located in mining districts 9, 10, and 11 (Illinois, Indiana, and West Kentucky)):

COUNTY	STATE	Estimated Strip Tonnage (Tons)	Estimated Deep Tonnage (Tons)	Percentage of Recovery Used for Estimated Tonnage	
				Strip	Deep
Jefferson	Illinois		97,961,664		74.42%
Williamson	Illinois		16,498,272		74.42
Macoupin	Illinois		55,456,800		50.00
Christian	Illinois		11,642,400		50.00
Montgomery	Illinois		141,034,992		50.00
Sangamon	Illinois		11,760,000		50.00
	Total Tons:		334,354,128		

5. Explain briefly methods used for determining percentage of recovery for both strip and deep tonnage: Present and past experience in mining these seams.

6. Information supplied is as of December 31, 1968.

1087 4838

DEFENDANT'S EXHIBIT 230

ILLINOIS POWER COMPANY

500 SOUTH 27TH STREET, DECATUR, ILLINOIS 62525

April 13, 1970

Mr. Donald G. Kempf, Jr.
Kirkland, Ellis, Hodson,
Chaffetz & Masters
130 East Randolph
Chicago, Illinois 60601

Dear Mr. Kempf:

This letter will confirm our phone conversation of April 11. As I advised you then:

1. Illinois Power Company has given consideration to nuclear energy as an alternative to coal in the past and will certainly compare the overall costs of fossil and nuclear in planning future generation;

2. Illinois Power Company had been aware of the United Electric-Freeman affiliation since around 1960 when Frank Nugent and the other representatives of the Crown interests went on United's Board and Johnny Morris replaced Frank Kolbe as President; and

3. Because of the location of the United Electric and Freeman mines as related to the generating stations of Illinois Power Company we had not regarded the two companies as competitors with respect to service to any particular station. Freight costs prevented such competition. After the combination of the two companies this same situation continued so long as I was President of the Company.

Very truly yours,

Allen Van Wyck
Chairman of the Board

4030 1070

DEFENDANT'S EXHIBIT 231

CENTRAL ILLINOIS PUBLIC SERVICE COMPANY

GENERAL OFFICES / 607 EAST ADAMS / SPRINGFIELD, ILLINOIS 62701

April 14, 1970

Mr. Donald G. Kempf, Jr.
Kirkland, Ellis, Hodson, Chaffetz & Masters
Room 2900 Prudential Plaza
Chicago, Illinois 60601

Dear Mr. Kempf:

In re United States v. General Dynamics Corporation, et al., Civil No. 67 C 1632 (N.D. Illinois)

This letter will confirm your discussion of the above lawsuit with representatives of our company a few weeks ago. We reviewed with you then the competitive situation concerning the coal supply at our four stations.

1. Our Meredosia generating station is on the Illinois River, in the area generally served by mines in the Fulton-Peoria freight district. We have purchased some dust from Freeman's Crown Mine in the Springfield freight district for this station in the past, but that is no longer available. Because of the transportation charges, screenings from the Springfield freight district would not be competitive with river coal at Meredosia.

2. Coffeen is a mine-mouth generating station, and it would not be possible for mines other than that at the station to compete for its coal business.

3. The only United Electric coal we consume at our Grand Tower generating station is a small amount of carbon.

4. The Hutsonville generating station is in the far eastern portion of Illinois, near the Indiana border, and could not be reached on a competitive freight rate by either United Electric or Freeman.

You have indicated that there might be some confusion concerning the meaning of paragraph 4 of our letter to Mr. Turner, of the Department of Justice, dated October 28, 1966. In the past and

CENTRAL ILLINOIS PUBLIC SERVICE COMPANY

currently, we have found that the prices of each of the two companies for coal offered to the Central Illinois Public Service Company have always been competitive with other available suppliers. We have no idea what effect, if any, the Freeman-United Electric combination will have upon our coal prices in the future.

You have advised us that the Department of Justice has designated our letter of October 28, 1966 as an exhibit in the above lawsuit. In view of this we are pleased to supply you with the information set forth above.

Yours very truly,

K. E. Bowen
President

KEB/bp

MAPP goals and accomplishments parallel the power development patterns of utility integration and savings for consumers proposed in the Federal Power Commission's National Power Survey Report issued late in 1964.

MAPP membership of midwestern power suppliers has more than doubled in less than three years.

MAPP is investigating the feasibility, timing and routing of transmission lines required to integrate the huge hydro-electric potential in Canada with power developments in the United States.

MAPP individual utilities originally planned to install about 70 generating units between 1967-80. Through regional planning the member systems now plan to install only about 35 units but the average size of each will be approximately doubled. This and other generation economies will result in savings of $268 million during this period.

MAPP will operate a Coordination Center which will ultimately employ a high speed central computer to coordinate regional power operations.

These accomplishments coupled with high voltage line construction have demonstrated that locally controlled power suppliers of all types of ownership working voluntarily together will provide the most dependable service at the lowest possible cost.

1 CANADIAN CROWN CORPORATION
Manitoba Hydro-Electric Board

14 INVESTOR-OWNED ELECTRIC UTILITY COMPANIES

Black Hills Power and Light Company
Interstate Power Company
Iowa Electric Light and Power Company
Iowa-Illinois Gas and Electric Company
Iowa Power and Light Company
Iowa Public Service Company
Iowa Southern Utilities Company
Lake Superior District Power Company
Minnesota Power & Light Company
Montana-Dakota Utilities Co.
Northern States Power Company
Northwestern Public Service Company
Otter Tail Power Company
Union Electric Company

26 MUNICIPAL ELECTRIC UTILITIES

Adrian, Minnesota
Alexandria, Minnesota
Ames, Iowa
Austin, Minnesota
Cedar Falls, Iowa
Delano, Minnesota
Detroit Lakes, Minnesota
Fairfax, Minnesota
Fairmont, Minnesota
Glencoe, Minnesota
Hutchinson, Minnesota
Kenyon, Minnesota
Lake Crystal, Minnesota
Madelia, Minnesota
Marshall, Minnesota
Managua, Minnesota
Melrose, Minnesota
Moorhead, Minnesota
Muscatine, Iowa
New Ulm, Minnesota
Owatonna, Minnesota
Redwood Falls, Minnesota
Sleepy Eye, Minnesota
Watertown, South Dakota
Windom, Minnesota
Worthington, Minnesota

2 PUBLIC POWER DISTRICTS

Omaha Public Power District
Consumers Public Power District

7 RURAL ELECTRIC G&T COOPERATIVES

Cooperative Power Association
(18 distribution cooperatives)
Dairyland Power Cooperative
(37 distribution cooperatives)
Eastern Iowa Light and Power Cooperative
Minnkota Power Cooperative
(12 distribution cooperatives)
Northern Minn. Power Association
(6 distribution cooperatives)
Rural Cooperative Power Association
(6 distribution cooperatives)
Southwestern Federated Power Cooperative
(6 distribution cooperatives)

Low Cost Electric Power And Dependability

DEFENDANT'S EXHIBIT 232

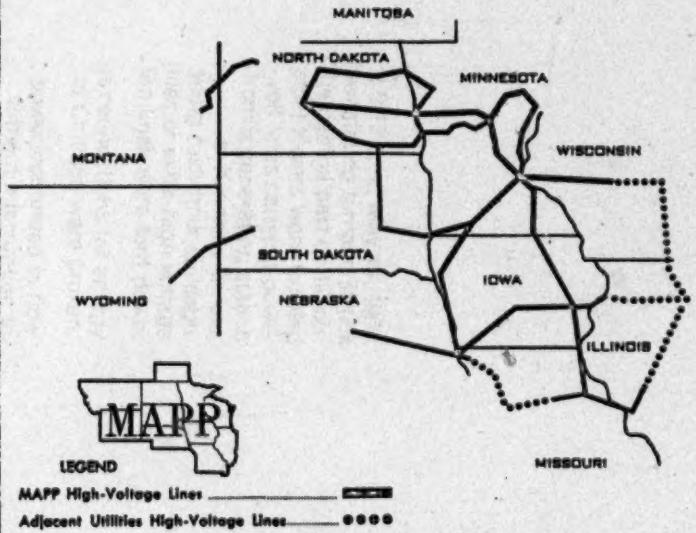
...Through

. . . dependable electric service at the lowest possible cost through coordinated planning and construction of electric transmission and generation facilities in ten states and the province of Manitoba.

MAPP, the nation's first regional power planning organization, is composed of investor-owned utilities, cooperatives, municipalities, public power districts and a Canadian utility.

Planning together MAPP members and several adjacent power suppliers will construct a 5,400 mile network of high-voltage transmission lines by 1980 connecting major power use centers and generating plants. Cost of the lines and associated substations will total more than $230 million. Without MAPP planning this great expansion program would cost many millions of dollars more.

MAPP HIGH-VOLTAGE NETWORK



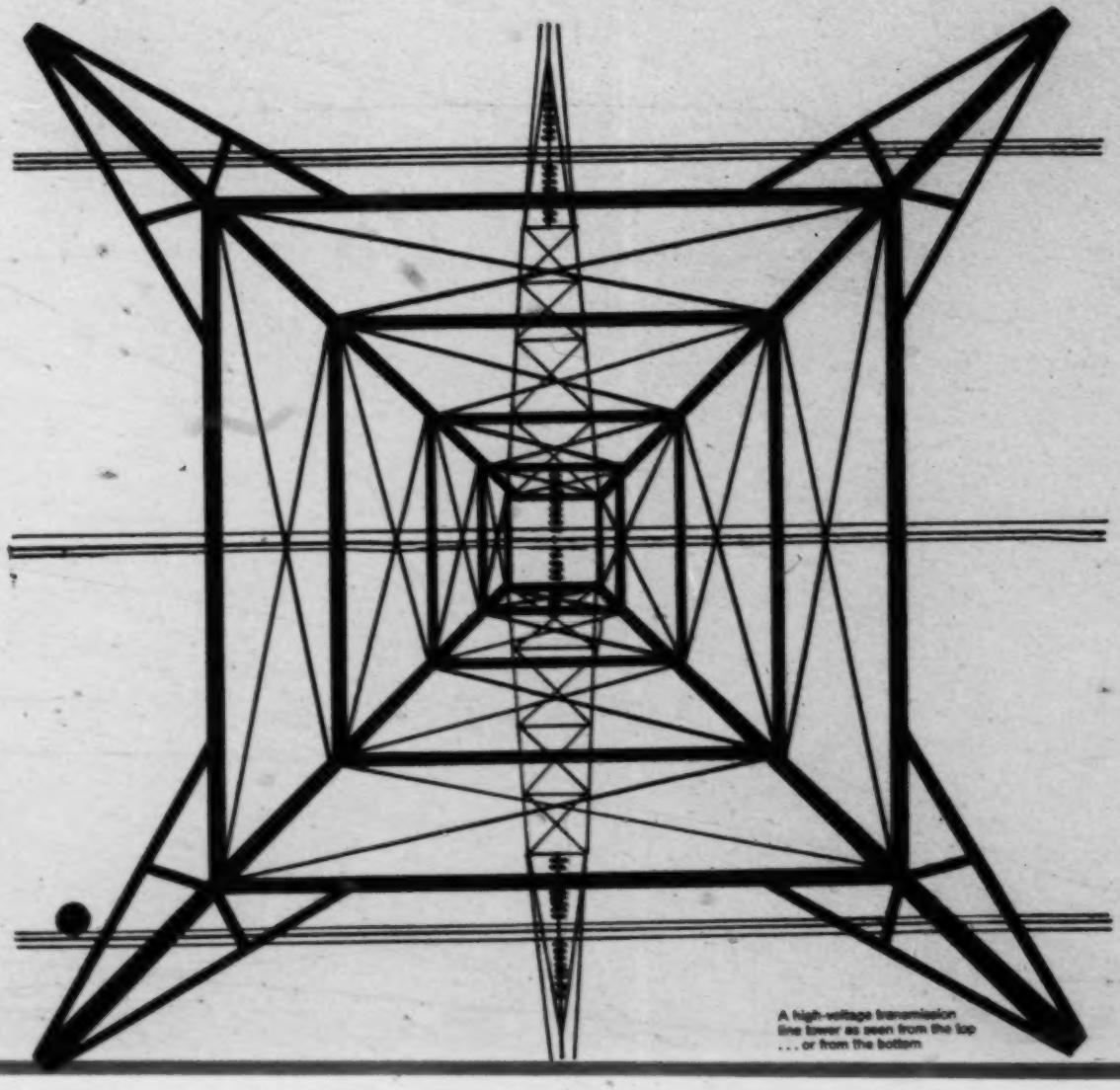
4,500 Miles of High-Voltage Lines Already in Progress!

Since its organization in early 1963 Mid-Continent Power Planners (MAPP) has made significant progress. Transmission lines and associated electric equipment will be built and owned by the utilities they connect and through whose territory they pass. MAPP will help determine where these lines should be built and when they will be needed.

Mid-America Interpool Network

main

DEFENDANT'S EXHIBIT 233



A high-voltage transmission line tower as seen from the top . . . or from the bottom

At 5:12 p.m., May 15, 1968,
a devastating tornado struck
the central part of Illinois.
Eighty-six steel towers were toppled
with two 345,000-volt lines carrying power
200 miles from a generating station
at Kincaid, Illinois,
to a bustling rush-hour Chicago.
Twenty miles of extra-high voltage
transmission lines were torn down.

Both direct connections for energy
from Kincaid to Chicago were broken.

Yet, in Chicago, power continued to flow
without interruption to
Commonwealth Edison Company customers.
Elevators ran in high-rise buildings.
Rapid transit electric trains moved
downtown throngs home.
Throughout the metropolitan area,
housewives prepared evening meals.
Children's TV was not disturbed.

Kincaid maintained its production
as transmission lines of MAIN
partners—Illinois Power Company,
Central Illinois Public Service Company,
and others—relayed the energy
to other lines serving Chicago.

Years of planning paid off
in an emergency, automatically.

This was **main** at work.

main

The Mid-America Interpool Network is an organization of power systems serving major load centers in the Middle West. There are 19 regular members consisting of 18 investor-owned power companies and one rural electric association. In addition, there are four liaison members from an adjacent coordinating group. Also, associate memberships are available to municipal and other small electric systems.

MAIN's prime purpose is to assure the reliability of electric power production and transmission throughout the region it serves. How does it work? MAIN members coordinate such functions as planning, construction and utilization of generating and transmission facilities on a basis that takes into account the needs of the entire region. This enables all MAIN affiliates to engineer, build, maintain and operate their respective power supply systems in a manner consistent with the utmost dependability and efficiency.

members

Illinois Group

Commonwealth Edison Company
Central Illinois Light Company
Central Illinois Public Service
Illinois Power Company

Missouri Group

Associated Electric Cooperative
Union Electric Company

Eastern MAPP Group

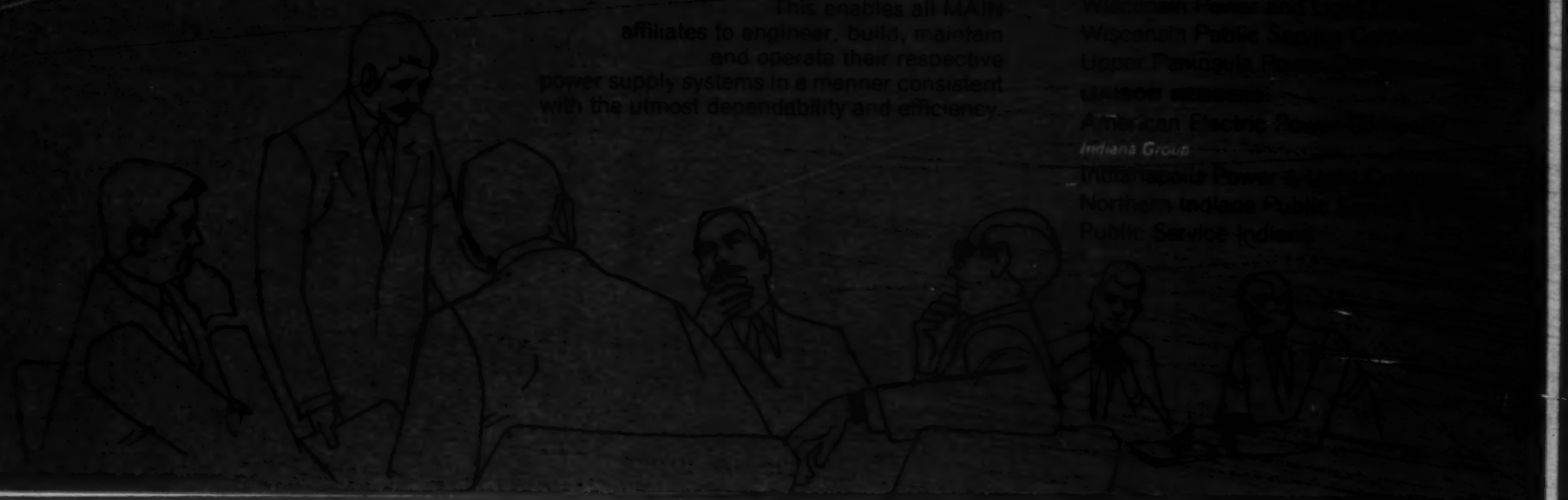
Interstate Power Company
Iowa Electric Light and Power Co.
Iowa Illinois Gas and Electric Co.
Iowa Power and Light Company
Iowa Public Service Company
Iowa Southern Utilities Co.
Northern States Power Co.

Wisconsin-Upper Michigan Systems

Madison Gas and Electric
Wisconsin Electric
Wisconsin Michigan Power
Wisconsin Power and Light
Wisconsin Public Service Corp.
Upper Peninsula Power Co.

Indiana Group

American Electric Power
Indianapolis Power & Light
Northern Indiana Public Service
Public Service Indiana



the goal of reliability

Somewhere in Wisconsin, or Illinois, or Missouri, or in any other Mid-America state, a child's hand touches a switch and the darkness of a room turns to light. Hundreds of miles away giant machines automatically make a hairline adjustment. Another hundred watts is on the line—*instantly*.

This natural action—turning on the light is so simple, and its results so certain, it has long ceased to be a wonder in a modern world, even for children. Still, this miracle is the subject of constant and sophisticated development and research, of improvement on a day-to-day basis and of a continuing drive toward the goals of highest quality and reliability of service.

Coordinated planning to increase reliability is an established way of life in the electric power industry. Begun many years ago, the voluntary cooperation among separately managed power companies has now evolved into 12 major networks of power systems serving the entire United States. The ready availability and dependability of electric energy for productivity, comfort, convenience and safety in industry, commerce, farms and homes is to a great extent the result of the coordinated activities carried on by these regional power pooling organizations.

This is the story of one of these voluntary associations

main

the Mid-America Interpool Network.

organization

Historically, MAIN is an outgrowth of a trend that developed in the early 1930's when Midwest power companies began to connect their transmission lines to each other to fortify their reliability and gain the advantages of diversity and economy. After World War II, these interconnections were expanded and the philosophy and techniques of network activity developed rapidly.

During the last decade, increases in generating unit size and improvements in the technology of extra-high voltage transmission have lent themselves naturally to a dual objec. :
(1) Increased reliability and protection from large-scale outages by planned utilization of available power from neighboring utilities, and
(2) Economies resulting from coordinated scheduling of new production and transmission facilities and the maintenance of such equipment.
The coordinated management of interconnected generating units and transmission lines has also enabled MAIN companies to utilize to the best advantage any surplus power that becomes available on a day-to-day basis from larger, more economical units.

More or less informal, yet binding, agreements gradually drew MAIN members closer and closer together in mutual planning and led to the formal organization of the Mid-America Interpool Network in November 1964.

MAIN and the forerunning associations of its members have compiled a long history of working for reliability of service through coordinated planning and operation of interconnected power systems. Members of MAIN aided in the preparation of the Federal Power Commission National Power Su. -y

and some of the policies and patterns established by MAIN are considered models of inter-company system cooperation.

The accompanying map exhibits the geographic expanse of MAIN and its overlapping relationships with other regional power groups. It should be noted that American Electric Power system and three Indiana utilities as liaison members of MAIN provide coordinated relationships with power systems to the east. To the west, Union Electric Company in St. Louis maintains liaison with the Missouri-Kansas Pool for additional avenues of cooperation. Toward the northwest, some of the MAIN area overlaps the area of the Mid-Continent Area Power Planners (MAPP). To the south, Associated Electric Cooperative, Inc. provides access to relationships with the Southwest Power Pool. And the Illinois-Missouri companies and AEP are in coordinated contact with the Tennessee Valley Authority to the southeast.

As a result, MAIN is the Midwest hub of a power pooling effort that directly affects and improves the reliability of electric service to 23,100,000 people in nine states. And through its coordinated relationships with other pools and systems, it vitally aids the cause of reliability through a much wider region of 15 states.

how main operates

The work of MAIN is performed by an Executive Committee consisting of representatives from each of the participating major groups, and by Engineering and Operating Committees. Their function is to do the detailed work of system coordination . . . to improve the already high reliability of the power supply in the Midwest.

MAIN's Engineering Committee regularly tests the soundness of individual company and pool plans by reviewing their effect on the region. To accomplish this, the Committee studies such matters as regional transmis. power flows for normal and emergency system conditions, system stability, and the ability of the interconnected systems in the region to cope with possible major catastrophes.

By using high-speed computers to perform the needed complex studies, the committee examines specific conditions expected during peak load periods and other critical times. These studies provide information to system operators to help them anticipate and solve problems that may be encountered.

An important function of the Engineering Committee is long-range planning. The committee analyzes the future development of extra-high voltage EHV transmission systems and interconnections among the systems to assure reliable performance.

The MAIN Operating Committee's activities include the establishment of adequate communication channels between companies, coordination of generating unit maintenance, formulation of procedures for system protection and investigation of disturbances of major consequence.

The MAIN Coordination Center has been operating in the Commonwealth Edison Building in Chicago since April 1, 1967. This Center maintains hour-by-hour communications with the major members of the MAIN group and with similar centers in other regions. Its staff collects, analyzes and disseminates information on all operating conditions in the region which might affect interconnected operations. Here, maintenance down time or planned outages of major generating and transmission facilities are closely coordinated to avoid combinations of outages which might threaten system reliability. By such activities, the Center provides an operating overview of the entire region—for the entire region.

New major generating facilities for the

main

Mid-America Interpool Network

Company	Station
American Electric Power Company	Big Sandy No. 2 Mitchell No. 1 Mitchell No. 2 J. E. Amos No. 1 J. E. Amos No. 2 D.C. Cook No. 1 D.C. Cook No. 2 Unidentified Unidentified
Associated Electric Cooperative	Thomas Hill No. 2 New Madrid
Central Illinois Light Company	Edwards No. 3
Central Illinois Public Service Company	Coffeen No. 2
Commonwealth Edison Company	Dresden No. 2 Dresden No. 3 Quad-Cities No. 1 Quad-Cities No. 2 Zion No. 1 Powerton No. 5 Zion No. 2
Illinois Power Company	Baldwin No. 1 Baldwin No. 2
Indianapolis Power & Light Company	Petersburg No. 2
Interstate Power Company	M.C. Kapp 3
Iowa Electric Light and Power Company	Duane Arnold
Iowa-Illinois Gas and Electric Company	Quad-Cities No. 1
Iowa Power and Light Company	Cooper
Iowa Public Service Company	Neal No. 2
Northern Indiana Public Service Company	D.H.M. No. 11 Unidentified
Northern States Power Company	Monticello Prairie Island No. 1 Prairie Island No. 2
Public Service Indiana	Cayuga No. 1 Cayuga No. 2
Wisconsin Electric Power Company	Valley No. 2
Wisconsin Electric Power Company Wisconsin Michigan Power Company	Point Beach No. 1
Wisconsin Electric Power Company Wisconsin Michigan Power Company	Point Beach No. 2
Wisconsin Power and Light Company	Edgewater No. 4
Wisconsin Public Service Corporation Wisconsin Power and Light Company Madison Gas and Electric Company	Kewaunee No. 1
Union Electric Company	Labadie No. 1 Labadie No. 2 Labadie No. 3 Labadie No. 4
Upper Peninsula Power Company	Unidentified

*Quad-Cities No. 1 is an 800,000 kw unit, jointly owned by Commonwealth Edison Company and Iowa-Illinois Gas and Electric Company

**Cooper unit for which Iowa Power and Light Company has made a 30 year contract for 300 mw in the Iowa Pool. This will be an 800,000 kw unit located in Nebraska and owned by Consumers Public Power System.

Capacity, Kw.	Type	Serv. Date
800,000	Fossil	Sept., 1969
800,000	Fossil	June, 1970
800,000	Fossil	Feb., 1971
800,000	Fossil	July, 1971
800,000	Fossil	March, 1972
1,100,000	Nuclear	April, 1972
1,100,000	Nuclear	April, 1973
1,300,000	Fossil	Oct., 1973
1,300,000	Fossil	April, 1974
290,000	Fossil	June, 1969
600,000	Fossil	April, 1972
350,000	Fossil	Jan., 1972
600,000	Fossil	March, 1972
809,000	Nuclear	Jan., 1970
809,000	Nuclear	Dec., 1970
*405,000	Nuclear	Jan., 1971
809,000	Nuclear	Jan., 1972
1,100,000	Nuclear	April, 1972
840,000	Fossil	April, 1972
1,100,000	Nuclear	May, 1973
600,000	Fossil	June, 1970
600,000	Fossil	Jan., 1973
450,000	Fossil	July, 1969
[illegible]00	Fossil	May, 1975
8[illegible],000	Nuclear	Dec., 1973
*404,000	Nuclear	Jan., 1971
**389,000	Nuclear	April, 1972
325,000	Fossil	June, 1972
110,000	Fossil	June, 1970
400,000	Fossil	June, 1973
545,000	Nuclear	May, 1970
550,000	Nuclear	May, 1972
550,000	Nuclear	May, 1974
503,000	Fossil	May, 1970
508,000	Fossil	May, 1972
140,000	Fossil	June, 1969
497,000	Nuclear	April, 1970
497,000	Nuclear	April, 1971
330,000	Fossil	Dec., 1969
525,000	Nuclear	June, 1972
600,000	Fossil	Jan., 1970
600,000	Fossil	Jan., 1971
600,000	Fossil	Jan., 1972
600,000	Fossil	Jan., 1973
107,000	Fossil	Jan., 1973

reliability and the future

Reliability is not a stand-still thing. Projection of electric load growth shows that the nation will need twice as much power producing capability in 1980 as required in 1970.
In building for this future growth, the coordinated planning and performance of MAIN companies will produce their greatest benefit.

In 1968 alone, MAIN members strengthened their interconnected power supply systems with the addition of 4.5 million kilowatts of generating capacity, a 12.3 percent increase.
In the same year, 600 miles of new 345,000-volt transmission lines were added, a 16 percent increase.

During the five years, 1969 through 1973, MAIN companies plan to install 28 million kilowatts of generating capacity, a growth of 55 percent.
In that period too, the transmission system will be strengthened by the construction of over 3700 miles of 345,000-volt lines, an increase of 85 percent.
Also, a network of 765,000-volt lines will be placed in service to provide a new and stronger backbone for the interconnections that tie MAIN companies together.
Each 765,000-volt line will have the capacity to move 4,000,000 kilowatts from one location to another.

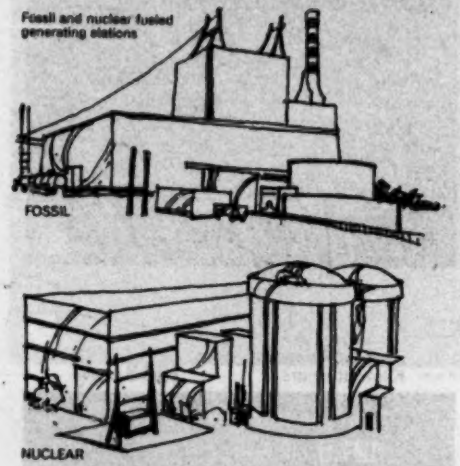
The extra-high voltage transmission system in Mid-America will continue to expand and possibly reach the stage shown in the 1980 map.

This growth, with reliability and strength as its core, calls for maximum planning and effort.

That is the story of ■

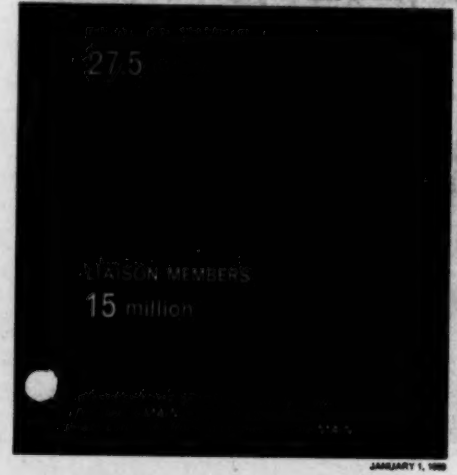
main

main highlights



Generating Capacity
Kilowatts*

42.5 million



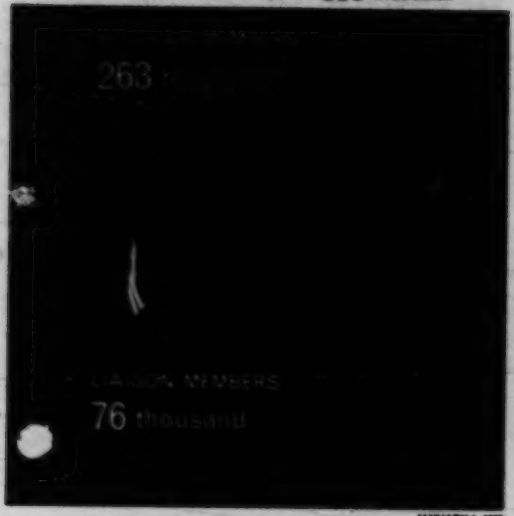
JANUARY 1, 1959

Peak Load Kilowatts **38.5 million**

Energy Sales
Kilowatt Hours **198.8 billion**

Miles of transmission lines **27.7 thousand**

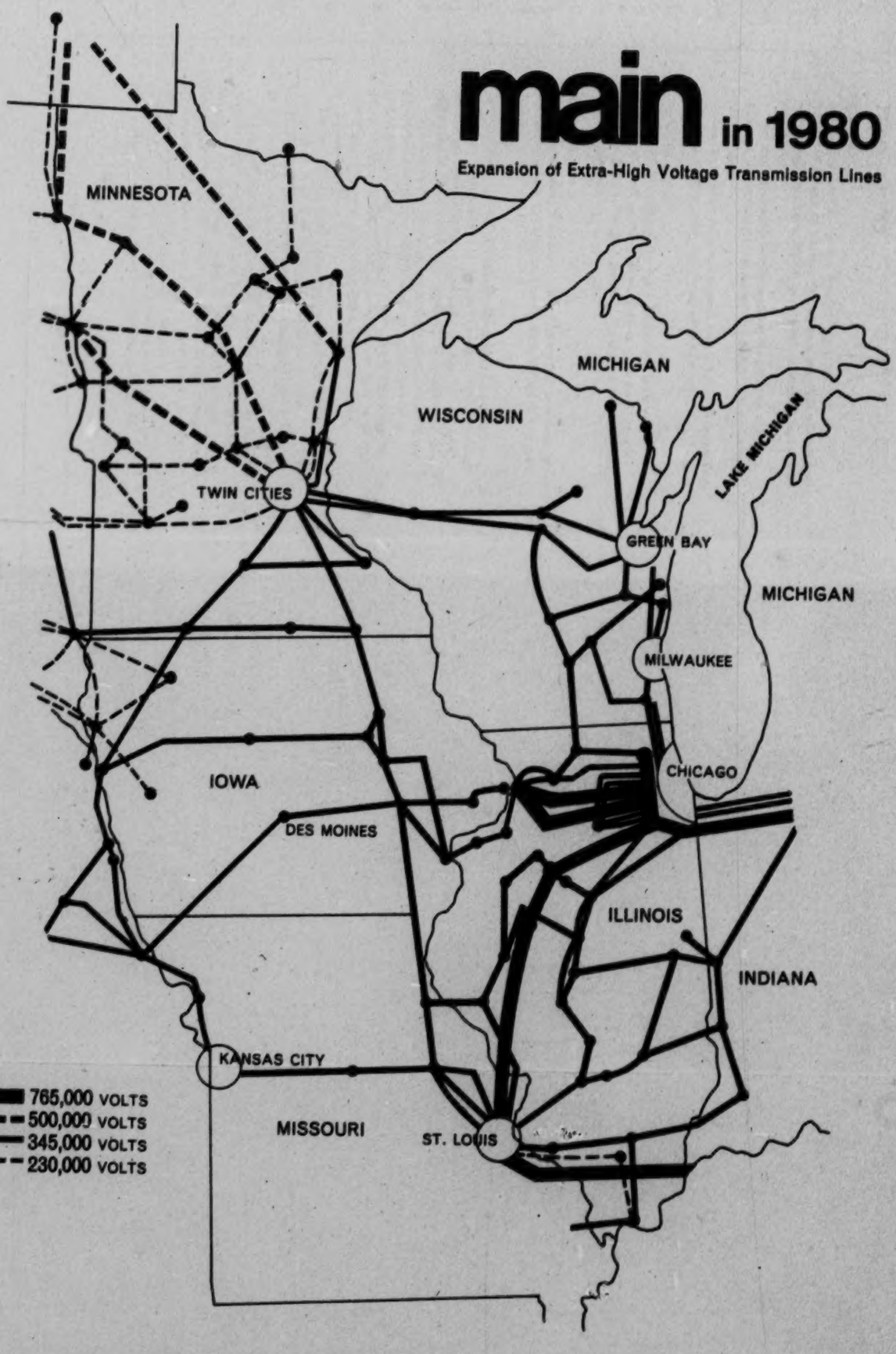
Square miles of area served **339 thousand**



Number of customers **9.7 million**

Population **33.5 million**

main
transmission
system
DULUTH
TWIN CITIES
MINNESOTA
SIOUX FALLS
WISCONSIN
GREEN BAY
MADISON
SIOUX CITY
DUBUQUE
CEDAR RAPIDS
DES MOINES
DAVENPORT
OMAHA
IOWA
PEORIA
MISSOURI
ILLINOIS
DECATUR
SPRINGFIELD
ST. LOUIS

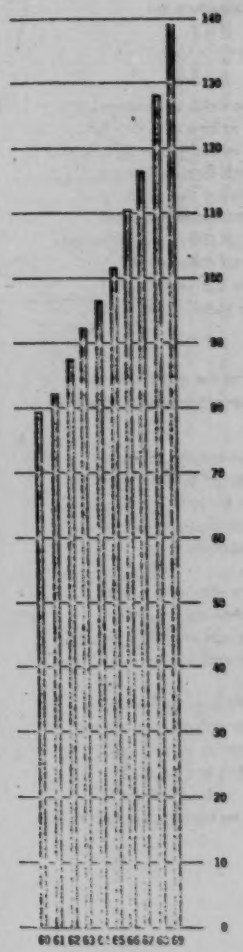

main in 1980
Expansion of Extra-High Voltage Transmission Lines
MINNESOTA
MICHIGAN
WISCONSIN
LAKE MICHIGAN
TWIN CITIES
GREEN BAY
MICHIGAN
MILWAUKEE
CHICAGO
IOWA
DES MOINES
ILLINOIS
INDIANA
KANSAS CITY
MISSOURI
ST. LOUIS
765,000 VOLTS
500,000 VOLTS
345,000 VOLTS
230,000 VOLTS

DX 234

Illinois Power Company - Annual Report 1969

* * *

ELECTRIC REVENUES
Millions of Dollars



Progress in '69

EARNINGS

Earnings per share of common stock in 1969 were $2.67. The increase of 24 cents per share, or 9.9 per cent, over 1968 was achieved even though there were 500,000 more shares outstanding than at the end of 1968.

Net income, which is before provision for preferred stock dividends, was $37,668,000, compared with $33,337,000, an increase of 13 per cent.

Total earnings for the common stock were $35,557,000 as compared with $31,226,000 in 1968, an increase of 13.9 per cent.

DIVIDEND

At its September meeting, the Board of Directors declared a quarterly dividend on the common stock of 50¢ a share, payable November 1, 1969. This is an increase of 5 cents over the previous quarterly dividend.

REVENUES

Revenues from sales of electricity were $138,909,000, an increase of 8.5 per cent over 1968. Gas revenues were $73,825,000, up 11.3 per cent.

ELECTRIC

Electric sales of 7,972,000,000 kilowatt-hours were 9.5 per cent higher than in 1968. Sales to industrial customers, which accounted for 53.6 per cent of all kilowatt-hour sales, were up 10.4 per cent, slightly higher than the increase in commercial and residential sales.

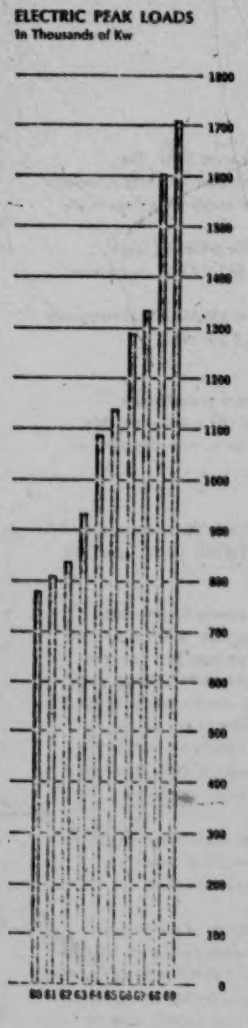
To help meet the increasing demand for electric power in our growing territory, the first 600,000 kilowatt unit of our electric generating station near Baldwin in Southern Illinois is scheduled to go into operation in time for the summer peaks of 1970. Work on a second unit of the same size, scheduled to begin operations in 1973, has begun.

Two 345,000-volt transmission lines from Baldwin station to areas of heavy industry on the Illinois side of the St. Louis metropolitan area are scheduled to be completed before the first unit goes into service.

As a further step to strengthen our capability of meeting peak demands in 1970 and in the future, the Company purchased 170,000 kilowatts of gas turbine generators. Of this, 100,000 is being installed near Granite City and will be ready for service by late spring. The other 70,000 kilowatts being installed near La Salle may be delayed because of a strike against the supplier.

Scheduled construction of electric facilities over the next five years is expected to total $523 million, about $292 million for

* * *



TAXES

In line with national trends, property and other general taxes have continued to increase. In addition, on August 1, 1969, the State of Illinois imposed a 4 per cent income tax on corporations. However, amendment of federal tax laws to reduce the surcharge from 10 per cent to 5 per cent, effective January 1, 1970, and to eliminate this tax on July 1, 1970, will tend to reduce the impact of these increased taxes.

FINANCING

The Company sold 500,000 shares of common stock in January, 1969, at a net price of $18,825,000. The sale of $35 million of 8.35% First Mortgage Bonds in October, 1969, provided an additional $34,694,000. The sale of these securities, together with short-term bank loans, provided the new cash required by the Company during the year.

In January, 1970, the Company sold 500,000 additional shares of its common stock. This sale provided $15,738,000 of the estimated $70 million of new cash which will be required during 1970. The balance of such funds will be provided by the issuance of additional securities, through short-term bank loans, or both.

ENVIRONMENT

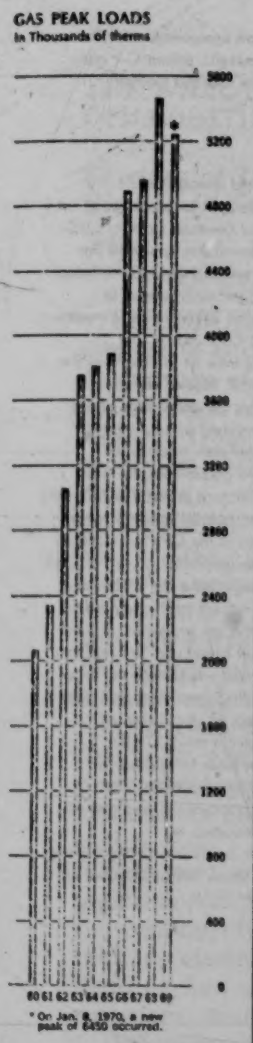
Environmental pollution has emerged as one of the nation's most difficult and urgent problems. For our Company, the main problem is air pollution.

Equipment is available for removing particulate matter from stack emissions and our plans have been approved by the Illinois Air Pollution Control Board to meet its standards for particulates. These plans include installation of electrostatic precipitators, along with other steps. Over the next five years we expect to spend some $16 million on this program.

Technology has not yet been developed to eliminate sulphur oxides from stack emissions. To hasten such development, we are taking part in various studies and research projects and are following with interest the work of others. We are also studying the availability, cost, and feasibility of other fuels.

The Illinois Commerce Commission, by which our Company is regulated, is conducting an investigation of air pollution by electric utility companies in the state. We have appeared at its hearings and expect to be called upon for additional data and testimony.

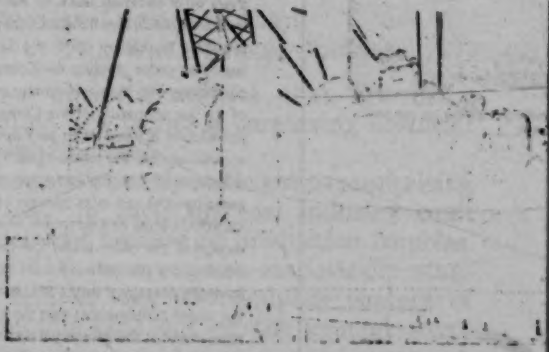
At this point—with standards, regulations, and technology all in a period of change and formation—there is no basis for any accurate



estimation of the eventual cost to our Company and our customers of doing our part in cleaning up the air.

INTERCONNECTIONS

Our Company, Central Illinois Public Service Company, and Union Electric Company entered into a contract in November, 1969, with Tennessee Valley Authority providing for new interconnection facilities between the systems of the three companies and TVA. The



A dual-fuel peaking unit turbine is pictured being placed in the Granite City area near Stallings, where four units will produce 100,000 kilowatts of power.

contract provides for the exchange of firm quantities of diversity power on a seasonal basis between TVA and the three companies as well as other operating benefits. Under the contract, Illinois Power will provide 65,000 kilowatts of capacity to TVA during the winter seasons when we expect to have excess capacity, and TVA will make available to the Company 65,000 kilowatts of capacity during our peak summer seasons when TVA expects to have excess capacity. This arrangement begins in November of 1972.

Union Electric has notified our Company and Central Illinois Public Service Company of the termination of the interconnection agreement under which the Illinois-Missouri Pool has operated since 1952. Termination of the contract becomes effective April 1, 1972. Prior to that time, new interchange agreements will be negotiated between the companies which will provide benefits similar to those in the present agreement.

Workmen installing gas regulator station.

Our Company has other interconnection agreements with the American Electric Power system, Commonwealth Edison Company, Central Illinois Light Company, Iowa-Illinois Gas and Electric Company, and Electric Energy, Inc.

CIPS ACQUISITION

On March 28, 1968, the Company and Central Illinois Public Service Company announced a proposal to offer to exchange .65 of a share of IP common stock for each share of common stock of CIPS. In March, 1969, the Illinois Commerce Commission approved the proposal. In January, 1970, the Securities and Exchange Commission issued an order granting the Company's application subject to conditions—(1) that appropriate provision be made for the divestment of the gas properties of the Company and CIPS and (2) that jurisdiction is reserved to pass upon the fairness of the terms of the acquisition and the terms of such divestment. Neither company will proceed with the exchange offer unless the divestment of the gas properties can in its opinion be accomplished without injury to its stockholders or customers. Studies undertaken prior to the receipt of the order under the then known possibilities did not develop any plan which would not result in such injury. The following footnote contained in the SEC findings and opinion accompanying the order contemplates that the acquisition of the CIPS stock and divestment of the gas properties may be accomplished on such a basis:

> "The companies may appropriately determine the nature and timing of any steps to be taken with respect to the acquisition of CIPS stock and the divestment of the gas properties in light of pertinent financial and money-market conditions. The reasonable flexibility available to the companies would thus not foreclose the selection of a program entailing more than one stage in the interests of feasibility and fairness to all concerned."

However, the determination of whether such a result can be accomplished will require further study by both companies. If this appears possible, further proceedings before the SEC and the Illinois Commerce Commission and acceptance or approval of stockholders of both companies will be required.

The SEC denied a contention of certain holders of CIPS preferred stock that the approval of the application should be conditioned on the elimination of the CIPS preferred.

• • •

DEFENDANT'S EXHIBIT 235

THE WALL STREET JOURNAL, Monday, April 6, 1970
COMMODITIES

Shortage of Low-Sulphur Coal Hampers Electric Utilities in Antipollution Efforts

By THOMAS LINDLEY EHRICH
Staff Reporter of THE WALL STREET JOURNAL

PITTSBURGH — Electric utilities that are being pressed to cut pollution are facing a perplexing obstacle: A shortage of low-sulphur coal.

Developed reserves aren't nearly sufficient to meet rising demand from utilities. In fact, the coal industry can't even meet present demand because of production troubles. And while potential U.S. reserves are statistically staggering—some 1.02 trillion tons with sulphur content of 1% or less—getting this coal out of the ground won't be done easily or soon.

Nor will it come cheaply. Mining executives estimate that low-sulphur coal, if it ever becomes widely available for utility use, will cost as much as 50% more than medium and high-sulphur coals. This is due to expensive mining conditions generally associated with low-sulphur coal, plus the big expense of opening new mines. The price could go even higher if utilities are forced to bid against the steel industry, the prime user of low-sulphur coal.

Such cost and availability problems will directly affect pollution-control planning by many utilities, particularly the coal-burning plants that provide more than half the nation's electricity. These utilities are in the process of deciding how to meet stringent curbs on sulphur dioxide emissions, and many hope to switch to low-sulphur coal.

Difficulties in making such a switch could encourage some utilities to drop coal entirely, moving to low-sulfur fuel oil, to sulphur-free fuels such as natural gas or to increased reliance on nuclear power. The coal industry, however, hopes utilities will install stack-gas cleaning

devices, thus permitting continued use of medium and high-sulphur coals.

Less than one-quarter of the coal burned by electric utilities these days is low-sulphur coal. (Low-sulphur generally means sulphur content of 1% or less, though some states are setting a 1.5% limit.) Sulphur content of the rest ranges up to about 6%, with the bulk of utility coal use in the 1.6% to 3.5% range. In recent years, use of coal toward the top end of the sulphur-content scales has increased due to improvements in furnace efficiency.

Moving out of this coal-buying pattern couldn't be done in the current market. Nowadays, mine output is committed under long-term contract. Existing mines are operating at capacity, so new mines would be needed to meet increased utility demand. (For the moment, at least, steelmakers have the inside track on new supplies of low-sulphur coal. Reserve stockpiles at U.S. mills are dangerously low due to coal production shortfalls the past two years, and foreign steel companies are starting to bid aggressively for U.S. coal.)

Less than one-fourth of known U.S. low-sulphur coal reserves is the bituminous coal burned by nearly all coal-fired steam plants. Some 78% of the total represents subbituminous coal and lignite, grades that couldn't be used in the bituminous-fired plants without expensive boiler alterations.

The 21% that is bituminous coal isn't an insignificant amount, of course. These 215 billion tons could last for centuries. But the need and supply don't mesh. Some 90% of utility coal use is east of the Mississippi. The biggest and most easily mined reserves lie in Colorado, Utah and Wyoming. Freight costs from there to Midwestern utilities would be twice the current charges for shipment from Midwestern mines.

Low-sulphur reserves in the Eastern coal states amount to an ample 82 billion tons or 38% of the total bituminous low-sulphur reserves. Coal men, however, say the best Eastern deposits are owned or controlled by steel producers for their own use and the rest lies in thin, hard-to-mine seams. "There isn't enough left to make a real

dent in the utility market," says John Corcoran, president of Consolidation Coal Co., a subsidiary of Continental Oil Co. Says another coal man: "When you're talking thin seams, you're doubling the cost."

Another problem is the health of the coal industry. Demand is strong now, but a sizable portion of the industry—the hundreds of small and medium-sized operators—would be endangered by wholesale switches from medium and high-sulphur coals. These smaller firms probably would go out of business, industry observers say. Even big operators would be hard pressed to finance the heavy capital investment involved in constructing new mines. Some already are asking customers to help finance mine construction.

For this reason, coal industry spokesmen are urging utilities to invest in sulphur-dioxide removal systems. At the same time, coal executives are urging regulatory agencies to go slow on enforcing strict pollution-control rules.

Even if low-sulphur coal is to be mined, it will be costly. Coal men are estimating prices as high as 40 cents per million BTUs, compared with 21 cents to 26 cents for high-sulphur coal now being burned. (BTU, for British thermal unit, is a measure of heat. Coal and other fuels usually are priced according to heat content, not according to tons or barrels).

Utilities might well be willing to pay such prices, of course. Utilities in the Great Lakes are paying 45 cents per million BTUs for imported low-sulphur fuel oil and as much as 60 cents for domestic oil. But in the long run, coal at such prices probably would cease to be competitive with nuclear power, currently rated at 28 cents to 30 cents per million BTUs, and with imported fuel oil if import rules are eased as some utilities are seeking.

Also, coal men say a good many coal-fired plants couldn't switch to low-sulphur coals without costly changes. One industry spokesman estimates 85% of the coal plants in New Jersey, for example, "couldn't use it without major furnace revisions." The reason is that most coal-fired plants are designed to burn a certain

type of coal, often from a particular region of the coal-fields. (The New Jersey plants burn coal from the Fairmont, W. Va., area.)

Long-range developments could alter the picture greatly. The Western coals, for example, won't always be inaccessible. Several Midwest utilities are starting to buy in Wyoming, hauling the coal in multicar, fast-loading "unit trains," which cut freight costs substantially.

Another possibility is shipping the electricity instead of the coal. Utilities would build steam plants at the Western mines, and then use extra-high-voltage transmission cables to send electricity to users. Use of this technique is considered imminent, both out West and in the more remote sections of the Eastern coal-fields. Presently, the cost of extra-high-voltage transmission is quite high.

Also, some utilities are starting to build plants designed to use the plentiful lignite and subbituminous coals.

DEFENDANT'S EXHIBIT 236

PEABODY COAL COMPANY
GENERAL OFFICES · 301 NORTH MEMORIAL DRIVE
ST. LOUIS, MISSOURI 63102
TELEPHONE GENEVA 6-3400

MARVIN O. YOUNG
VICE PRESIDENT AND GENERAL COUNSEL

April 1, 1970

Mr. Reuben Hedlund
Kirkland, Ellis, Hodson,
Chaffetz & Masters
Prudential Plaza
Chicago, Illinois 60601

RE: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D.Ill.)

Dear Mr. Hedlund:

Pursuant to your telephone request of today concerning certain coal reserves owned by Peabody in McDonough, Schuyler, Adams, Brown and Hancock Counties, Illinois, I would like to advise you as follows:

Peabody acquired some coal reserves in these counties during the period 1958 through 1960 by way of leases. The leases on coal reserves in Brown County, Illinois have been dropped.

Since the early part of 1961 Peabody has not attempted to acquire any further coal reserves in these Counties and has no plans at the present time to develop any of these reserves because the tonnage involved is so small that it would be economically impossible to mine such reserves.

Very truly yours,

Marvin O. Young

Marvin O. Young

MOY:nlh

DEFENDANT'S EXHIBIT 237

PRACTION OF TOTAL ILLINOIS PRODUCTION
OF LEADING COMPANIES OTHER THAN
PEABODY* (Percentages)

Year	Freeman	2-4	2-6	2-8	2-10
1957	14.8	31.5	44.9	55.1	61.0
1958	15.7	33.8	48.4	59.1	65.2
1959	23.2	42.0	54.7	63.5	68.1
1960	24.1	42.6	55.6	64.1	68.2
1961	24.4	42.0	54.7	63.7	67.8
1962	24.2	42.4	56.5	65.5	70.1
1963	22.9	41.2	53.4	60.1	63.2
1964	23.4	42.1	53.6	61.1	64.5
1965	21.6	39.9	54.0	62.7	65.7
1966	21.4	43.0	57.8	65.5	66.7[1]
1967	21.8	44.1	57.8	65.4	66.9

* Assumes CWP was part of Freeman in 1957 and subsequently and that UEC and Freeman were merged from 1959 on.

1. Assumes 10th largest producer had 300,000 tons production.

Source: Government Exhibits 62 through 72

AVERAGE PRODUCTION, PER COMPANY*
(ILLINOIS PRODUCTION OF ILLINOIS PRODUCERS)
(000 Tons)

Year	Leading Companies[1]	Non-Leading Companies
1954	1500	25
1957	2600	23
1958	2450	18
1959	2900	18
1960	2900	24
1961	2900	25
1962	3300	31
1963	3500	38
1964	4400	38
1965	4050	34
1966	6800	55
1967	6350	44

* Assumes CWF was part of Freeman in 1957 and subsequently and that UEC and Freeman were merged from 1959 on.

1. Nearest 50,000 Tons.

Source: Government Exhibits 12, 62 through 72.

CHANGES IN CONCENTRATION IN ILLINOIS

COAL PRODUCTION SINCE 1959

-TWO MEASURES-

	Production of Top 2		Production of Top 4		Production of Top 10	
	Govt.	Adj.*	Govt.	Adj.*	Govt.	Adj.*
1959	36.2	44.3	55.0	63.1	87.2	89.3
1960	35.5	44.7	55.5	63.1	86.7	88.8
1961	36.2	46.0	55.9	63.5	87.3	89.3
1962	35.8	45.9	56.3	64.1	89.6	91.8
1963	42.7	52.2	62.5	70.5	91.3	92.5
1964	42.9	53.5	64.0	72.3	93.5	94.7
1965	41.8	51.0	60.4	69.2	94.4	95.1
1966	42.8	52.0	64.4	73.6	96.8	97.3[1]
1967	52.9	52.9	75.2	75.2	98.0	98.0
Change 59-67	+16.7	+8.6	+20.2	+12.1	+10.8	+ 8.7
Change due to Peabody	+10.0	+10.0	+10.0	+10.0	+10.0	+10.0
Change due to others	+ 6.7	- 1.4	+10.2	+ 2.1	+ 0.8	- 1.3

*Adjustment consists of recognizing Freeman-UEC as merged effective 1959 instead of 1967.

[1] Assumes 10th largest had 300,000 tons production.

Source: Government Exhibits 62 through 73

CHANGES IN CONCENTRATION IN ILLINOIS, INDIANA
AND WESTERN KENTUCKY SINCE 1959
-TWO MEASURES-

	Production of Top 2		Production of Top 4		Production of Top 10	
	Govt.	Adj.*	Govt.	Adj.*	Govt.	Adj.*
1959	33.1	37.9	46.6	51.5	71.9	73.9
1960	33.4	38.5	46.5	51.7	71.5	73.6
1961	34.4	39.8	47.2	52.6	72.0	74.4
1962	35.4	40.4	48.1	53.1	75.7	78.3
1963	41.5	46.3	53.7	58.6	78.2	80.4
1964	43.4	47.7	55.3	60.6	81.0	83.2
1965	42.6	46.4	55.8	60.5	85.2	87.5
1966	44.1	47.7	57.6	62.0	88.9	91.2
1967	48.6	48.6	62.9	62.9	91.4	91.4
59-67	+15.5	+10.7	+16.3	+11.4	+19.5	+17.5
a-body	+12.2	+12.2	+12.2	+12.2	+12.2	+12.2
Rest	+ 3.3	- 1.5	+ 4.1	- 0.8	+ 7.3	+ 5.3

*Adjustment consists in recognizing Freeman-UEC as merged effective 1959 instead of 1967.

Source: Government Exhibits 77 through 85

WESTERN UNION
SENDING BLANK

CALL LETTERS FBJ DLPD 3/5/70 CHARGE TO National Coal Association
Washington, D. C.

DEFENDANT'S EXHIBIT 238

The President
The White House
Washington, D. C.

Page 1 of 3 pages

The Wall Street Journal of today (article by Burt Schorr, page 14) reports that the Oil Import Board of Appeals has decided to open the Midwest to foreign residual oil. If so, this Nation is threatened with dire future consequences. We can have both clean air and reliable electricity, only by using domestic coal with techniques now available for the removal of sulphur dioxide from stack gas. The manufacturers of sulphur removal equipment will guarantee performance, and indications are that the cost will be no greater

WESTERN UNION
SENDING BLANK

CALL LETTERS FBJ DLPD CHARGE TO

The President Page 2 of 3 pages

than the cost of using foreign oil.

Unfortunately, the electric utilities are more inclined to comply with clean air regulations by switching to foreign oil. If they are permitted to do this, the domestic coal industry will suffer. But far more important, the entire national security will be endangered, because it will lead eventually to very heavy dependence on energy sources which are unreliable because of problems in Mid-East and other sources and because of possible interruptions in transportation over great distances. In addition, the government will be afflicted with a serious drain on our balance of

WESTERN UNION
SENDING BLANK

CALL LETTERS FBJ DLPD CHARGE TO

The President Page 3 of 3 pages

payments.

The Nation can and should have clean air and reliable energy. We hope you will do whatever you can to see that the utilities build sulphur removal facilities which will permit use of our most abundant energy source rather than switch to foreign oil. To this end, existing limitations on foreign oil imports to the Midwest should be retained.

Stephen Dunn, President

~~1931~~ 1921

DEFENDANT'S EXHIBIT 239

PROPOSED PLANS OF COMPLIANCE WITH CHICAGO AIR POLLUTION CONTROL ORDINANCE OF THOSE FACILITIES FOR WHICH A RESPONSE TO COURT-ORDERED SUBPOENA QUESTIONNAIRE WAS RECEIVED

There are forty facilities [excluding Commonwealth Edison generating stations] which are located within the Metropolitan Chicago Interstate Air Quality Control Region, as designated 42 C.F.R. §81.14, and for which a response to the Court-Ordered Subpoena Questionnaire was received. [See Table D-P of Defendants' Exhibit No. 55].

Of these forty facilities, the following ten are located inside the City of Chicago:

	Company & Facility		1967 Total Coal Consumed 1/
1.	Campbell Soup		Less than 20,000 tons
2.	Celotex Corporation		22,000 tons
3.	Central Soya-Chemurgy Division		65,000 tons
4.	Container Corporation	- Water Street	23,000 tons
5.	Container Corporation	- Ogden Avenue	20,000 tons
6.	Darling, Inc.	- Ashland Avenue	34,000 tons
7.	Darling, Inc.	- West 46th Street	60,000 tons
8.	Interlake Steel	- Torrance Avenue	395,000 tons
9.	International Harvester	- Wisconsin Steel Division	25,000 tons
10.	International Harvester	- Tractor Division	21,000 tons
11.	Proctor & Gamble		60,000 tons
12.	Sherwin Williams		23,000 tons
13.	Swift & Company		28,000 tons

TOTAL: 10 companies; 13 facilities; over 776,000 tons of coal

The above facilities are subject to Section 17-25(3)(a) of the Municipal Code of Chicago, as amended by Ordinance of June 23, 1969 [Journal of the City Council, pp. 5618-5619] 2/ and are subject to the jurisdiction of the Chicago Department of Environmental Control.

1/ Source: The respective Form 150 responses of the companies set forth above.

2/ An excerpt of this provision is attached hereto as an Appendix.

That agency sent out a questionnaire in October of 1969 to the approximately 2,500 industrial facilities in Chicago which burn fuel (oil, gas or coal) at a rate of 288,000 BTU per hour on an annual average. The purpose of this inquiry was to obtain from the recipients the manner or plan of compliance with §17-25(3)(a) proposed for these facilities.

As a follow-up to the Court-Ordered Subpoena Questionnaire, the following is a summary of the responses to the Department of Environmental Control inquiry for those facilities for which a subpoena response was also received.

Group I. Two of the above facilities burn low sulphur Southern Illinois metallurgical coal for the purpose of coking. This coal has a sulphur content of less than 1.3% and falls well below the Ordinance requirement.
1967 tonnage represented: 420,000 tons.

Group II. Of the remaining 11 facilities, 2 did not respond to the Department of Environmental Control inquiry.
1967 tonnage represented: 50,000 tons.

Group III. Of the remaining 9 facilities:

A. 6 facilities have converted, or will convert during the year 1970, all coal-burning boilers to use gas, low sulphur #6 oil or a combination of both.
1967 tonnage represented: 179,000 tons.

(1) 1 of these 6 has converted to natural gas/low sulphur oil but may need to burn a small amount of low sulphur (less than 2.5%) coal for emergency use.

(2) 4 of these 6 have converted coal-burning units to oil and gas units and are burning no coal whatsoever.

(3) 1 of these 6 is burning natural gas on an interruptible basis until mid-1970, at which time it will have converted its combustion units to the use of #6 (low sulphur) oil.

B. 2 facilities will continue to burn coal in the boilers but will burn coal of less than 2.5% sulphur content.
1967 tonnage represented: 81,000 tons.

C. 1 of the above group will convert to the equal use of gas and oil by October of 1970. After such conversion, this facility also intends to continue to burn high sulphur coal in a quantity which is one-third its present coal consumption rate.
1967 tonnage represented: 65,000 tons.

The respondent for this facility stated that two coal suppliers had informed it that there would ~~be~~ not be available to the respondent coal with a sulfur content of less than 2.5%.

DEFENDANT'S EXHIBIT 240

Copyright 1961 by
McGraw-Hill Publishing Co., Inc.
Printed in U.S.A.

Price $15.00 per copy

D. C. McGRAW, JR., Publisher
The Mining Papers
—Coal Age—Engineering & Mining Journal—E & M J Metal & Mineral Markets
—Keystone Coal Buyers Manual—Coal Mine Directory—Weekly News Bulletin Service

JOSEPH J. FORSYTHE, General Manager
GEORGE P. NELSON, Assistant General Manager
FRANK J. VOSBOVITCH, Assistant Editor

Keystone Coal Buyers Manual
Coal Mine Directory
Weekly News Bulletin Service

330 West 42nd Street, New York 36, N. Y.

DISTRICT 10

All coal producing counties in the State of Illinois are included in Bituminous Coal Producers District No. 10.

Source: Illinois Dept. of Mines & Minerals
Statistics For State Calendar Year 1939
Total Tonnage: 45,371,859
Strip Tonnage: 20,332,328
No. of Mines: 139
Total Employees: 10,827

Source: United States Bureau of Mines
1939 Total Tonnage: 45,165,616
1939 Strip Tonnage: 21,911,997
Size of Mines—1939
500,000 Tons & Over—39
250,000 To 500,000—9
100,000 To 250,000—6
50,000 To 100,000—11
Less than 50,000—72

Railroads Serving: AT&SF; B&O; CB&Q; C&EI; C&IS; C&NW; CRI&P; G&CE; GM&O; IC; L&N; MP&L; NeMex; NYC; PRR; SLA&SF; TP&W.

Alphabetical Directory of Coal Operating Companies and Mines that produced 10,000 tons or over annually and some smaller mines whose tonnage moves by rail or water into important competitive markets.

Addresses of officials are the same as the company or the office or mine address under which the name appears, unless a separate address immediately follows the name.

Detailed data submitted by Operators was gathered in December 1940; January, February & March 1941.

There are 51 Companies and 59 Mines listed herein.

GULL & COLLIER COAL CO.
208 So. LaSalle St.
Chicago 4, Ill.
(Operates also in Ind. Ill
(&Z. with Retailer Coal & Coke Co.
Dist. 10)
Chm. Bd.....Alfred M. Jaques
Pres.....Sidney Colliers
Exec. Vice Pres.....W. F. Lenahan
Vice Pres. & Treas.-C. W. Peterson
Sec.....J. O. Hayes
Vice Pres.
Warren P. Woodbury
Vice Pres. Sales Promo.
Willard Wakefield
Vice Pres. Lake Sales...S. M. Reeves
Asst. to Pres.....R. F. McDonough
Asst. to Pres.....M. E. Walsh
Asst. to Exec. Vice Pres.
R. C. Rasmussen
Supt. Mines
J. W. Morris, D. I. Allen
Operating Officer—Johnston City, Ill.
Vice Pres. (Chge.)...Roland Wilson
Asst. to Vice Pres. (Chge.)
R. F. Wilson
Pres. Emp.....Wesley Smith
Instal. Engr.....Arthur Trevis
Safety Engr.....Ora Smith
Pur. Agt.....J. C. Davis
Dir. Educ.....Gilbert Emerson
Gen. Washer Supt.....Wm. McFall
Ch. Accnt., Dir. G. Retirer Coal Co.
1940 Illinois Production, 4,264,214

Retailer No. 2 Mine.

P. O.....Zeigler, Franklin Co., Ill.
Sh. Pt.

Retailer Mine. IC. C&G. MoPac

Supt.....Edmund Crystal
Mine Mgr.....Fred Barrell
Assist. Clerk.....Jess Thomas
Clerk.....Ray Crane
Prep. Supt.....Ray Carney
Power Plant.....
Power Plant.....Henry Jones, Wash.
Asst. Supt.....Tim Callahan
Asst. Supt.....Jerry Lutz, Elec.
Oil Spray Dust Treat.
Coal Cor. (Screen, Coal) (2 Scales)
—500 T.
Tipple Hand: 7 at 0
Tipple Hand (Screens): 2 at 0
Tipple Hand: 7 at 0; 3 at 1; 2 at 1½; 2 at 2
Tipple Hand: 2 at 2½; 1 at 3
Tonnage Cleared, 1940.....1,000,000
Tipple Hand: 7 at Mine; Machine: 7 at Mine; Machine: 7 at Mine; Machine: 7 Mill Drive; 2 Rock Dust.; 7 Units Haul Each 45 Ponies

Machine Units: 10 Gyrol M. Cars; 12 Yds. Loaded; 42" T.C.; 24 Mach. Cl. Cars; Mother Coal.
Power Purchased: D.V. 220 D.C. Trolley; 440 A.C.
Prep. Cleaned: 2 Units, 12 ton; Equipment: Jigs & Screens; Capacity: 600 T.
Tipple Storage: 2,000 T.
1940 Tonnage, 1,072,147

Retailer No. 4 Mine

P. O.....Johnston City, Williamson Co., Ill.
Mine.....Retailer Mine, IC, MP & GM & O & C & E. R. Sect.
Supt.....
Mine Mgr.....Raymond Gallatin
Assistant Clerk.....Mike Jarvis
Mach.....Charles Crossland
Hoist: No. 2, 80" T.D.
Pres. Mgr.....Overseer Mitchell
Developer of Plant: McKain-Pittsburg 300 H.P. Oil.
Power: Units: McKain-Pitt. Washington Dealer Units; Thermal Drive; Alaska Yd. Boats; Crusher; Lids. Boats; Rotary Oil Unit Trans.; Cylinder Power Coal Cutter.
Daily Cap. (Screen) Coal)
(2 Scales).....4000 T.
Mine Washed: Yes
Mine Screened: 2" 3" 2" 3" 2" 3"
2" 1½"; 1½" 1" 1" 1½" 1" ¾"
1" ¾"; ¾" 1½" 1 1000; ¾" 1 1000; ¾" 1 0
Tonnage Cleared, 1940.....1,071,241
Trade Name: Retailer Super-Washed
Mkt. Distr.: 8 Mkt. Coal Distr. 1 877 Carload Mines 1 Mkt. Lake, 4 Coal Miners Each Dist. 1 Units Haul Each; 5 Ponies
Machine Units: Gyrol M. 7 Yds. Loader 14 Units; Cars: 87 Steel
Pur. Coal: T.D. 42"
Power Purchased: 2 Units 75 D.V.
Prep. Cleaned: 2 Units, 30 TPH.
270 Employees; 2 shifts
1940 Tonnage, 1,072,042

Retailer Mine

P. O.....Herrin, Ill.
Mine.....
Supt.....
Mine Mgr.....
Prep. Supt.....
Power Plant.....
Trade Name: Retailer Coal
Mkt. Distr.: Coal Distr. 1 Mine; Machine: 1 Mill Drive; 1 Rock Dust.; 1 Units Haul Each 45 Ponies

Daily Cap. (Screen) Coal)
(2 Scales).....3000 T.
Mine Washed: 0 1 0
Mine Screened: Over 6", over 3", 6 x 3; 3 x 1½; 1½ x ¾; 1 x ¾; 1½ x ¾.
Tonnage Cleared, 1940.....500,000
Trade Name: Murdock Superwashed Mat. Distr.: 2 Ont. Mach.; 4 Loa.; 3 Drills
Haulage Units: 42" T.C.; 3 Shuttle Cars Conveyor
Power Pur.: 500 D.C., 440 A.C.
Prep. Cleaned: 12th Intake, 47 TPH; Equipment: No. 2 Jeffrey Duplex Washer
1940 T.
1940 Tonnage, 500,000
For additional data, see page 453

BELLE VALLEY COAL CO.

R.D. 1, Bellevile, Ill.
Pres. & Gen. Mgr.....C. G. Gilbert
Chief Engr.....E. W. Flood
Sales Agts.:
Retailer & Associates

Belle Valley Mine

P.O.....Belleville, R.D.8, Ill.
Supt.....Kenneth Wall
Mine Mgr.....Kenneth Wall
Chief Clerk.....C. E. Dasenbrock
Tipple Foreman.....Edward Williamson
Hours Per Day: 8 Hours; 40 Per Week
Prep. Mgr.....Harry Niemueller
Designer of Plant: Weimer
Prep. Supt.....Wilbur Harry Zobelin
Washer(s): Crushed: Screens
Daily Cap. (Screen) Coal).....600 T.
Hoist: 4; 2 @ 2 x 2; 2 @ 2½ x 2½ x 2½
Mach.: Lds. Units: 4 Yds. Loader
T.C. 42"; 16-2 ton steel cars
Power Purchased: D.V. 440 D.C.
Employees 42; 2 shifts; Idle Equip. 10 TPH; Daily Cap. 600 T.
1940 Tonnage, 75,000

BIG TEN COAL CO.

7-56 N. Meridian St.
Indianapolis, Ind.
Mercantile Trust Co. Bldg.
Chicago, Ill.
Pres.....
Vice Pres.....
Sec.....
Treas.....
Gen. Mgr.....
Pur. Agt.....
Engr.....
Supt.....
Mine Mgr.....
Chief Clerk.....
Prep. Supt.....
Power Plant.....
Trade Name: Crusher Lids.
Mkt. Distr.: Coal Distr. 1 Mine; Machine: 1 Mill Drive; 1 Rock Dust.; 1 Units Haul Each 45 Ponies
Machine Units: 10 Gyrol M. Cars; 12 Yds. Loaded; 42" T.C.; 24 Mach. Cl. Cars; Mother Coal.
Power Purchased: D.V. 220 D.C. Trolley; 440 A.C.
Prep. Cleaned: 2 Units, 12 ton; Equipment: Jigs & Screens; Capacity: 600 T.
Tipple Storage: 2,000 T.
1940 Tonnage, 1,072,147

Retailer No. 4 Mine

P. O.....Johnston City, Williamson Co., Ill.
Mine.....Retailer Mine, IC, MP & GM & O & C & E. R. Sect.
Supt.....
Mine Mgr.....Raymond Gallatin
Assistant Clerk.....Mike Jarvis
Mach.....Charles Crossland
Hoist: No. 2, 80" T.D.
Pres. Mgr.....Overseer Mitchell
Developer of Plant: McKain-Pittsburg 300 H.P. Oil.
Power: Units: McKain-Pitt. Washington Dealer Units; Thermal Drive; Alaska Yd. Boats; Crusher; Lids. Boats; Rotary Oil Unit Trans.; Cylinder Power Coal Cutter.
Daily Cap. (Screen) Coal)
(2 Scales).....4000 T.
Mine Washed: Yes
Mine Screened: 2" 3" 2" 3" 2" 3"
2" 1½"; 1½" 1" 1" 1½" 1" ¾"
1" ¾"; ¾" 1½" 1 1000; ¾" 1 1000; ¾" 1 0
Tonnage Cleared, 1940.....1,071,241
Trade Name: Retailer Super-Washed
Mkt. Distr.: 8 Mkt. Coal Distr. 1 877 Carload Mines 1 Mkt. Lake, 4 Coal Miners Each Dist. 1 Units Haul Each; 5 Ponies
Machine Units: Gyrol M. 7 Yds. Loader 14 Units; Cars: 87 Steel
Pur. Coal: T.D. 42"
Power Purchased: 2 Units 75 D.V.
Prep. Cleaned: 2 Units, 30 TPH.
270 Employees; 2 shifts
1940 Tonnage, 1,072,042

Retailer Mine

P. O.....Herrin, Ill.
Mine.....
Supt.....
Mine Mgr.....
Prep. Supt.....
Power Plant.....
Trade Name: Retailer Coal
Mkt. Distr.: Coal Distr. 1 Mine; Machine: 1 Mill Drive; 1 Rock Dust.; 1 Units Haul Each 45 Ponies

Daily Cap. (Screen) Coal)
(2 Scales).....3000 T.
Mine Washed: 0 1 0
Mine Screened: Over 6", over 3", 6 x 3; 3 x 1½; 1½ x ¾; 1 x ¾; 1½ x ¾.
Tonnage Cleared, 1940.....500,000
Trade Name: Murdock Superwashed Mat. Distr.: 2 Ont. Mach.; 4 Loa.; 3 Drills
Haulage Units: 42" T.C.; 3 Shuttle Cars Conveyor
Power Pur.: 500 D.C., 440 A.C.
Prep. Cleaned: 12th Intake, 47 TPH; Equipment: No. 2 Jeffrey Duplex Washer
1940 T.
1940 Tonnage, 500,000
For additional data, see page 453

BELLE VALLEY COAL CO.

R.D. 1, Belleville, Ill.
Pres. & Gen. Mgr.....C. G. Gilbert
Chief Engr.....E. W. Flood
Sales Agts.:
Retailer & Associates

Belle Valley Mine

P.O.....Belleville, R.D.8, Ill.
Supt.....Kenneth Wall
Mine Mgr.....Kenneth Wall
Chief Clerk.....C. E. Dasenbrock
Tipple Foreman.....Edward Williamson
Hours Per Day: 8 Hours; 40 Per Week
Prep. Mgr.....Harry Niemueller
Designer of Plant: Weimer
Prep. Supt.....Wilbur Harry Zobelin
Washer(s): Crushed: Screens
Daily Cap. (Screen) Coal).....600 T.
Hoist: 4; 2 @ 2 x 2; 2 @ 2½ x 2½ x 2½
Mach.: Lds. Units: 4 Yds. Loader
T.C. 42"; 16-2 ton steel cars
Power Purchased: D.V. 440 D.C.
Employees 42; 2 shifts; Idle Equip. 10 TPH; Daily Cap. 600 T.
1940 Tonnage, 75,000

BIG TEN COAL CO.

7-56 N. Meridian St.
Indianapolis, Ind.
Mercantile Trust Co. Bldg.
Chicago, Ill.
Pres.....
Vice Pres.....
Sec.....
Treas.....
Gen. Mgr.....
Pur. Agt.....
Engr.....
Supt.....
Mine Mgr.....
Chief Clerk.....
Prep. Supt.....
Power Plant.....
Trade Name: Crusher Lids.
Mkt. Distr.: Coal Distr. 1 Mine; Machine: 1 Mill Drive; 1 Rock Dust.; 1 Units Haul Each 45 Ponies
Machine Units: 10 Gyrol M. Cars; 12 Yds. Loaded; 42" T.C.; 24 Mach. Cl. Cars; Mother Coal.
Power Purchased: D.V. 220 D.C. Trolley; 440 A.C.
Prep. Cleaned: 2 Units, 12 ton; Equipment: Jigs & Screens; Capacity: 600 T.
Tipple Storage: 2,000 T.
1940 Tonnage, 1,072,147

Retailer No. 4 Mine

P. O.....Johnston City, Williamson Co., Ill.
Mine.....Retailer Mine, IC, MP & GM & O & C & E. R. Sect.
Supt.....
Mine Mgr.....Raymond Gallatin
Assistant Clerk.....Mike Jarvis
Mach.....Charles Crossland
Hoist: No. 2, 80" T.D.
Pres. Mgr.....Overseer Mitchell
Developer of Plant: McKain-Pittsburg 300 H.P. Oil.
Power: Units: McKain-Pitt. Washington Dealer Units; Thermal Drive; Alaska Yd. Boats; Crusher; Lids. Boats; Rotary Oil Unit Trans.; Cylinder Power Coal Cutter.
Daily Cap. (Screen) Coal)
(2 Scales).....4000 T.
Mine Washed: Yes
Mine Screened: 2" 3" 2" 3" 2" 3"
2" 1½"; 1½" 1" 1" 1½" 1" ¾"
1" ¾"; ¾" 1½" 1 1000; ¾" 1 1000; ¾" 1 0
Tonnage Cleared, 1940.....1,071,241
Trade Name: Retailer Super-Washed
Mkt. Distr.: 8 Mkt. Coal Distr. 1 877 Carload Mines 1 Mkt. Lake, 4 Coal Miners Each Dist. 1 Units Haul Each; 5 Ponies
Machine Units: Gyrol M. 7 Yds. Loader 14 Units; Cars: 87 Steel
Pur. Coal: T.D. 42"
Power Purchased: 2 Units 75 D.V.
Prep. Cleaned: 2 Units, 30 TPH.
270 Employees; 2 shifts
1940 Tonnage, 1,072,042

Retailer Mine

P. O.....Herrin, Ill.
Mine.....
Supt.....
Mine Mgr.....
Prep. Supt.....
Power Plant.....
Trade Name: Retailer Coal
Mkt. Distr.: Coal Distr. 1 Mine; Machine: 1 Mill Drive; 1 Rock Dust.; 1 Units Haul Each 45 Ponies

Daily Cap. (Screen) Coal)
(2 Scales).....3000 T.
Mine Washed: 0 1 0
Mine Screened: Over 6", over 3", 6 x 3; 3 x 1½; 1½ x ¾; 1 x ¾; 1½ x ¾.
Tonnage Cleared, 1940.....500,000
Trade Name: Murdock Superwashed Mat. Distr.: 2 Ont. Mach.; 4 Loa.; 3 Drills
Haulage Units: 42" T.C.; 3 Shuttle Cars Conveyor
Power Pur.: 500 D.C., 440 A.C.
Prep. Cleaned: 12th Intake, 47 TPH; Equipment: No. 2 Jeffrey Duplex Washer
1940 T.
1940 Tonnage, 500,000
For additional data, see page 453

BELLE VALLEY COAL CO.

R.D. 1, Belleville, Ill.
Pres. & Gen. Mgr.....C. G. Gilbert
Chief Engr.....E. W. Flood
Sales Agts.:
Retailer & Associates

Belle Valley Mine

P.O.....Belleville, R.D.8, Ill.
Supt.....Kenneth Wall
Mine Mgr.....Kenneth Wall
Chief Clerk.....C. E. Dasenbrock
Tipple Foreman.....Edward Williamson
Hours Per Day: 8 Hours; 40 Per Week
Prep. Mgr.....Harry Niemueller
Designer of Plant: Weimer
Prep. Supt.....Wilbur Harry Zobelin
Washer(s): Crushed: Screens
Daily Cap. (Screen) Coal).....600 T.
Hoist: 4; 2 @ 2 x 2; 2 @ 2½ x 2½ x 2½
Mach.: Lds. Units: 4 Yds. Loader
T.C. 42"; 16-2 ton steel cars
Power Purchased: D.V. 440 D.C.
Employees 42; 2 shifts; Idle Equip. 10 TPH; Daily Cap. 600 T.
1940 Tonnage, 75,000

BIG TEN COAL CO.

7-56 N. Meridian St.
Indianapolis, Ind.
Mercantile Trust Co. Bldg.
Chicago, Ill.
Pres.....
Vice Pres.....
Sec.....
Treas.....
Gen. Mgr.....
Pur. Agt.....
Engr.....
Supt.....
Mine Mgr.....
Chief Clerk.....
Prep. Supt.....
Power Plant.....
Trade Name: Crusher Lids.
Mkt. Distr.: Coal Distr. 1 Mine; Machine: 1 Mill Drive; 1 Rock Dust.; 1 Units Haul Each 45 Ponies

Bryant Mine

P.O.....Lewistown, Fulton Co., Ill.
Chm. Bd.....David Crane Kil.
Supt.....Orin Johnson
Prep. No. 2 mine; 60" T.D.
Prep. Mgr.....Sam Gilliland
Engineer of Plant: Deutsch Co.
Prep. Supt.....Pete Tuttle
Power: Units: Washers Yds. Loaders; Crusher; Lids. Boats; Trans.; Cylinder Power Coal Cutter.
Daily Cap. (Screen) Coal)
(2 Scales).....1700 T.
Mine Washed: Yes
Mine Screened: 6" x 3" Egg; 3" x 1½ M. Screen; ¾" x ¾" Slack
Tonnage Cleared, 1940.....342,427
Mkt. Distr.: 1 Mine; 1 Lds. Each; 1 Crusher Unit
Employee Hands: 4 Dailie Trades Work
Power Pur.: 440 A.C. 220 DTR
Prep. Loaded: Lids. Boats, 4 pos.; Tipples, 27; Daily Cap. 1500 T.
1940 Tonnage, 342,427
For additional data, see page 457

BLUE LICK COAL CO.

224 So. Michigan Ave.
Chicago, Ill.
Chm. Bd.....T. H. Goodwin
Pres.....Richard D. Goodwin
Sales Agt.: Retailer Coal & Coke Co.

Blue Lick No. 2 Mine

P. O.....Hutchinson, Kahoe Co., Ill.
Ship.....Hutchinson, Ill.
Pur. Agt.....
Supt.....
Mine Mgr.....
Prep. Supt.....
Power Units: Washers Yds. Loaders; Crusher; Lids. Boats; Trans.; Cylinder Power Coal Cutter.
Daily Cap. (Screen) Coal)
(2 Scales).....
Mine Washed: 1½ x 1000; 1" x 1000; ¾ x 1000
Mine Distr.: ¾" x 0"
Mine Tonnage, 2,700

...

...

...

1963
KEYSTONE
COAL BUYERS MANUAL

A McGraw-Hill Publication
© Copyrighted 1963 McGraw-Hill Publishing Co., Inc.
Printed in U. S. A.

Price $35.00 per copy

McGraw-Hill Mining Publications
Coal Age—Engineering & Mining Journal—E & M J Metal & Mineral Markets
Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

WILLIAM J. PARKIN, Publisher
Mining Publications

IVAN A. GIVEN, Editor
Keystone Coal Buyers Manual
Coal Age

GEORGE F. NIELSEN, General Manager
Keystone Coal Buyers Manual
Coal Mine Directory
Monthly News Bulletin Service

McGRAW-HILL PUBLISHING CO., INC.
330 West 42d St., New York 36, N. Y.

SANTON COAL CORP.
301 Main St., Petersburg, Ind.
Pres. ..... Kenneth Young
Vice Pres. ..... Bernard Young
Secy.-Treas. ..... Pamela Young
Sales Agts., Sexton-Hubbard Coal Co.

Walnut Grove Mine
P. O. ..... Harrisburg, Saline Co., Ill.
Seam: No. 2; 46" Thk.; No. 3; 46" Thk.
Supt. ..... Asa Hill
Fore. ..... Clifford Shepherd
Chf. Elec. ..... Jack Jenkins
Open. Mgr. ..... J. Vaughn
Des. of Plant: McNally-Pitt.
Prep. Plant Sup.: McNally Coal Prepn.; Rock Prep.-or-Flood
Raw Material: all
Sizes sized: ¼ x 200M
Prod'n Capacity: 1,000 Coal 2000
Sizes: 4 x 20; 3½ x 20; 3 x 20; 2½ x 20; 4 x 10; 3½ x 10; 3 x 10; 2½ x 10
Mine Equip.: Drills: Denver, Drag
Haulage Equip.: Trailer-Trailer, 20-Ton.
Power Purchased: Lilp Exper. 30 yrs.; Empire, 94
1942 Tonnage, 606,757
For additional data, see page 429

SOUTHWESTERN ILLINOIS COAL CORP.
1214 Merchants Bank Bldg., Indianapolis, Ind.
Pres. ..... Chester Jackson
V. Pres. ..... T. C. Collins, Jr.
2212 Prudential Plaza, Chicago 1, Ill.
Sec., Treas. & Gen. Mgr. ..... F. D. Sayre
Sales Agt., Walter Shelton & Co.

Streamline Mine
P. O. Percy, Randolph Co., Ill.
Rail ..... Percy, Gillum, L.P. & E.
Mine Supt. ..... W. E. Mullins
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Plant: Norton Washery
Daily Cap. (Cleaned Coal) ..... 4200 T
Sizes Washed: 6" Down
Refuse: No. 6; 72" Thk.
Mine Equip.: 1 stripping shovel; 2 shovelmat; 1 loading shovel; 1 overburden drill
Haulage Equip.: 8 Trust-Trails.
Power Purchased
Prep. Owned: Lilp Expos. 10 Yrs.; Hamilton, 11E; 3 shifts; Daily Cap. 4000 T.
1942 Tonnage, 1,072,000
For additional data, see page 33

STONEFORT COAL MINING CO., INC.
2239 N. Meridian St.,
Indianapolis 8, Ind.
Pres. ..... S. P. Sherwood
Vice Pres. (Oper.) William W. Edwards
Sec. & Treas. ..... S. A. Baldwin

Will Scarlet Mine
Sls. Agt., Stanley-Midland Coal Co.
P. O. ..... R.R. #1, Stonefort.
Williamson Co., Illinois
Ship. ..... Stonefort, ICC
Supt. ..... R. W. Edwards
Prod. Mgr. ..... J. W. Moore
M. Mech. ..... T. E. Davis
Shift, Days-Coloress, 3rd
Power Purchased ..... M. D. Vroom
Designer of Plant: Self-designed
Prep. Equip.: Baum Jigs, Crushers, Hardinge Vorti-Flow Dryer, Oil Treat.; Heat Driers Freeze-proof Treat.
Daily Cap. (Cleaned Coal) (1 shift) ..... 2000 T
Sizes Washed: 4" x 1½"; 1½" x ¾"; ¾" x ¼" x 10; 1¼" x 10 M; 1¼" x ¾" x 0"
Sizes Dried: ¾ x 0
Sizes Made: Exp. Nut, Scrg., Stoker

Trade Name: Stonefort
Mine Equip.: 1 stripping shovel; 3 loading shovels; 1 stripping shovel.
Haulage Equip.: 4 Trucks, 5 tractors.
Power: 33,000 V.-DY, 4000 D.C., 480 A.C.
Prep. Leased & Owned: Lilp Exp. 12 yrs.; Kinkaiyou Mine; 1 shift; Cap. 2000 T.
1942 Tonnage, 668,154

Allendale Mine
Sls. Agt., Pittsburg & Midway Coal Mining Co.
Loc. ..... Wyanion, Mark Co., Ill.
Ship. ..... Harrenal, CB & Q, C. & A., NW R&Ts.
Supt. ..... Dave Moon
Mine Mgr. ..... E. L. Kint
Shifts: No. 2 Seam; 4-2" Thk.
Prep. Equip.: Baum Wash.; Driers; Loil; Dust.
Daily Cap. (Cleaned Coal) ..... 2000 T.
Sizes Washed: All
Sizes Dried: ¾" x 0
Sizes Shipped: 6" x 1½", 2" x 1¼", 1½" x ¾", ¾" x ¼", ¼" x 0
Mine Equip.: Mines: Dust, 2 Joy loaders; Drills: 2 Joy; Shots: 4 Duns.; 1 Drag
Haulage Equip.: 6 Trks.
Pur. Pur., 4000 D.C., 440 A.C.
Prep. Owned & Leased: Lilp Expos. 20 yrs.; Equips. 9E; Daily Cap. 2000 T.
1942 Tonnage, 400,388
For additional data, see pages 439, 443, 449

UNITED ELECTRIC COAL COMPANIES, The
307 N. Michigan Ave.,
Chicago, Ill.
Pres. ..... J. M. Morris
Vice Pres. (60.%) ..... E. J. Kaufmann
Vice Pres. (Sales) ..... T. J. Tarey
Sec. ..... G. H. Osterbeck
Treas. ..... T. Murray
Treas. ..... John T. Hackett
Comm. ..... Wm. J. Haskell
Asst. ..... G. A. Anderson
Chief Mining Engr. ..... E. H. Inman
Pur. A.T. ..... Wm. A. Paisy
Prod. Mgr. ..... D. H. Burkhalter
Canton, Ill.
Land Engr. ..... T. H. Leitner
Dir. of Research & Mech. Devel. ..... J. J. Huey
Chf. Elec. ..... J. C. Rothermeyer
1942 Company Production, 4,648,936
Sales Agt., United Electric Coal Cos.

Buckhart Mine No. 17
P. O. ..... Canton, Fulton Co., Ill.
Ship. ..... Canton, CB & Q RR. & Ill. Short
Supt. ..... L. W. Harris
Quality Clerk ..... H. Fitzhenry
Mech. ..... J. S. Bruce
M. Mech. ..... W. J. Smith
Pit Foreman ..... Davis Campbell
Plant Foreman ..... S. H. Shields
Strip: No. 5 seam; 30" Thk.
Designer of Plant: Nelson Davis Co.
Prep. Equip.: 4 Nelson Heavy Media Washers; Oil Dust. Treat.; Crushers; Belt Conv.; Scrgs.; Pet. Loil; Dust. Loaders; Coldrum Freeze Proof
Daily Cap. (Cleaned Coal) (1 shift) ..... 6000 T
Sizes Washed: 6" x 2", 2" x ¼", ¼" x 28 M; 1¼" x 28 M; ¼" x 28 M
Sizes Shipped: Lump; Pea; Nut; Stoker; Egg
Tonnage Cleaned, 1940 1,326,250
Mine Equip.: 1 Scrp. Shvl.; 1 Dragline; 2 Lin. Shvls.; 2 Rotn. Drills; 1 Wheel Excavator
Haulage Equip.: 17 Trailer-Trailers; Units
Power Pur.: D.V., 4000 A.C.; 440 A.C.
Prep. Owned; Equipment 5th. 3 shifts; 7000 T. daily; Lilp Expos. 20 yrs.
1942 Tonnage, 1,347,433

Coba Mine No. 2
P. O. ..... Coba, Fulton Co., Ill.
Ship. ..... Lewistown, CB & Q RR.
Supt. ..... Coba, T.P. & W. RR.
Asst. Supt. ..... C. H. Chrisler
Quality Clerk ..... Asst. Turner
Shovel Clerk ..... W. L. Gamm
M. Mech. ..... Van Bennett
Pit Foreman ..... Ray McAdams
Plant Foreman ..... J. L. Emery
Strip: No. 5 seam; 28" Thk.
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: McNally-Norton Washers; Heidel Heavy Media; Deister Tabs; Crushers, Skirt, 9 Vib. Scrns.; Pet. Thk.; Ldg. Tunn.; Oil Dust. Treat.; Coldrum Freeze Proof
Daily Cap. (Cleaned Coal) (1 shift) ..... 4500 T
Sizes Washed: 6" x 4", 4" x 2", 2" x 1½", 1½" x ¾", ¾" x 3/16"; 1¼" x 28 M; ¾" x 28 M
Sizes Dried: ¾" x 0
Sizes Made: Lump; Nut; Pea; Stock; Egg; Rice
Tonnage Cleaned, 1940 1,040,285
Mine Equip.: 1 Scrp. Shvl.; 1 Overburden Drill; 1 Loil; Dust.; 1 Wheel Excavator
Haulage Equip.: 14 Trailer-Trailer Units
Power Pur.: D.V., 4000 A.C., 440 A.C.
Prep. Owned; Equipment 10E; 3 shifts; 6000 T. daily; Lilp Expos. 10 yrs.
1942 Tonnage, 827,349

Fidelity Mine No. 11
P. O. ..... DuQuoin, Perry Co., Ill.
Rail ..... Pinckneyville, IC & MP RR.
Supt. ..... Eric K. Laurell
Chf. Clerk ..... J. Underhill
M. Mech. ..... Wilur Hibbs
Pit Foreman ..... Jack Parker
Plant Foreman ..... M. Kriner
Designer of Plant: Koppers Co.
Strip: No. 5 seam; 70" Thk.
Prep. Equip.: Koppers Simplawaver & McNally-Norton Washers; Dust. Treat. Crusher; Vib. & Shkr. Scrns.; Pet. Thk.; Ldg. Tunn.; Coldrum Freeze Proof; Oil Dust. Treat
Daily Cap. (Cleaned Coal) (1 shift) ..... 6000 T
Sizes Washed: 3" Lump; 3" x 0"; 4" x 2", 2" x 1½", 1½" x ¾", ¾" x 28 M; 1¼" x 28 M; ¾" x 28 M; 3/16" Carb.
Sizes Made: Lump; Pea; Nut; Run; Stock; Slitr.
Tonnage Cleaned, 1940 1,448,927
Mine Equip.: 1 Scrp. Shvl.; 1 Wheel Exca.; 2 Overb. Drills
Haulage Equip.: 16 Trailer-Trailer Units
Power Pur.: 6600 KVA; D.V., 4000 A.C.; 440 A.C.
Prep. Owned; Equipment 14E; 2 shifts; 7000 T. daily; Lilp Expos. 20 yrs.
1941 Tonnage, 1,013,540

Mary Moore Mine No. 37
P. O. Dunville, Vermilion Co., Ill.
Ship. ..... Danville, CCI RR.
Supt. ..... H. Kruger
Fore. ..... J. E. Sell
Quality Clerk ..... E. Brewer
Strip: No. 6 & 7 Seams; 70" Thk.
Designer of Plant: United Electric Coal Cos.
Prep. Equip.: Vib. Scrns.; Heavy Media Washery, Oil Dust. Treat; CACle. Type Freeze-proof Treat.
Daily Cap. (Cleaned Coal) (1 shift) ..... 2000 T
Sizes Washed: 1½" x 0; 1½" x 0"
Sizes Shipped: Screens; Slitr.
Tonnage Cleaned, 1940 393,889
Mine Equip.: 1 Dragl.; 1 Ldg. Shvl.
Haulage Equip.: 6 Trucks
Power Pur.: Mine 4160 A.C.; Plant, 440 A.C.
Prep. Owned; Equipment 2E; 2 shifts; 1750 T. daily; Lilp Expos. 10 yrs.
1942 Tonnage, 338,179

Ramsey Mine
Loc. ..... Pesdo Co., Ill.
Coal ..... 6E, 7, Grand Tab
Sls. Mgrs. ..... F. C. Grand
Pit Fore. ..... A. H. Grand
Elect. ..... Ed. W. Ard, L.
Plant Fore. ..... C. E. Reed
Strip: No. 7 Seam
Mine Equip.: 4 ½ yd. Stripl Shvl.
Prep. Equip.: H.M. Washer; 2-6ft. Deister Air Flow. Filter; Heat Dryer
Daily Cap. 2,000 T.; Equipment; 4T
1942 Tonnage, 723,109
For additional data, see page 427

UTILITY COAL CO.
2340 N. Meridian St.,
Indianapolis 8, Ind.
(Adf. with Ille. Tre. Coal Co., Ill., Ind. 10 & Monon Coal Co., Ill., Ind. 10)
Pres. ..... Harrison Fletcher
V. Pres. ..... Charles Thelin
Gen. Mgr. ..... Miller E. Bohrer
Sls. Agt., Reliable Coal & Mining Co.

Marion Mine
P. O. Marion, Williamson Co., Ill.
Mail: Marion; M. P. & C.B.&Q. RR's
Supt. ..... Otto Pruett
Prod. Mgr. ..... Jos. Gordon
Strip: No. 6 seam; 70" Th.
Prep. Equip.: Deister Heavy Media; McNally Dryc'lones; Viking Oil Spray Dust Treat.; 6 Vib. Scrns.; 2 Belt Ldg. Bins.; Bird Rotosell Dryer
Daily Cap. (Cleaned Coal) 1000 T.
Sizes Washed: 6" x ¼"
Sizes Dried: ¾" x 0; ¾" x ¼"
Sizes Shpd.: 6" x 2", 2" x 1½", 1½" x ¾", ¾" x ¼", ¼" x 28M; ¾" x 28M; 1½" x 28M.
Mine Equip.: 1 Dragl.; 1 Orbdn. Drill
Haulage Equip.: 5 Trust.-Trails.
Power Pur.: Tunn; 440 A.C.
Prep. Owned & Leased: Lilp Expos. 10 yrs.
1942 Tonnage, 222,423
For additional data, see page 436

ZEIGLER COAL & COKE CO.
Box 116, Zeigler, Ill.
(Adf. with Bell & Zeiler Coal Co., 1940, 10)
Pres. ..... Alfred M. Rogers
Gen. Supt. ..... E. K. Green
Chf. Clk. ..... Charles Parrott
Pur. Agt. ..... J. C. ...
Sales Agts., Bell & Zeiler Co.

Spartan Mine
P. O. ..... Sparta, Randolph Co.
Rails ..... Sparta, M-I, M-P
Mine Mgr. ..... Cliff Tinsley
Elec. ..... Lowell Carter
Quality Clerk ..... Earl Irvin
Seam: No. 6 seam; 76" Th.
Prep. Equip.: Nelson Jig; L-D Thermal Dryer; Oil Dust. Treat.
Daily Cap. (Cleaned Coal) ..... 4000 T.
Sizes Washed: 3" x 28M
Sizes Shpd.: 6" x 4", 4" x 2", 2" x 1½", 1½" x ¾", ¾" x ¼", ¼" x 28M; ¾" x 28M; 1½" x 28M; ¾" x 28M
Mine Equip.: 7 Drills; 4 Ldrs.; 6 Cutters
Haulage Equip.: 10 Shuttle Cars; 20" Conveyor Belts
Power Pur.:
Prep. Owned; Equips. 13E; 3 shifts; Daily cap. 4000 T.
1942 Tonnage, 951,940
For additional data, see page 439

1964 KEYSTONE COAL BUYERS MANUAL

A McGraw-Hill Publication

© Copyrighted 1964 McGraw-Hill, Inc.
Printed in U. S. A.

Price $35.00 per copy

McGraw-Hill Mining Publications
Coal Age—Engineering & Mining Journal—E & M J Metal & Mineral Markets
Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

WILLIAM J. PARKIN, Publisher
Mining Publications

IVAN A. GIVEN, Editor
Keystone Coal Buyers Manual
Coal Age

GEORGE F. NIELSEN, General Manager
Keystone Coal Buyers Manual
Coal Mine Directory
Monthly News Bulletin Service

McGRAW-HILL, INC.
330 West 42d St., New York 36, N. Y.

* RAILROADS SERVING

AT&SF; BAO; CB&Q; C&EI; C&IM; C&NW; CRI&P; GA&K; GM&O; IC; L&N; M&StL; MoPac; NYC; PRR; SLSF; TP&W.

1962 TOTAL TONNAGE 43,487,362
1962 UNDERGROUND TONNAGE 23,962,311
1962 STRIP TONNAGE 24,585,051

SIZE OF MINES—1962

500,000 tons and over 34
200,000 to 500,000 12
100,000 to 200,000 6
50,000 to 100,000 9
Less than 50,000 43
(U. S. Bur. Mines)

THIS 1964 ILLINOIS DIRECTORY
26 COMPANIES, 57 MINES

ASSOCIATED COAL CO., INC.
P.O. Box 30, Marion, Ill.
Sls. Agt.: Lake Michigan Corp.

Glenview Mine
Loc.: Marion, Williamson Co., Ill.
Ship ..... Marion, MoPac. RR
Strip: No. 6 Seam
Prep. Equip.: Pit. Tks.: Oil Treat.; Jet Spray Wash.
Sizes Made: 2", 4", 3", 2", 1¼x¼", 1¼", 1¼x¾", Mod. ¾"x0 Clark.; ¾"xK0 Cath.
Trade Names: Fairview
Prep. Owned: Life Expec. 10 Yrs.
Daily Cap. 1300 T.

BELL & ZOLLER COAL CO.
208 So. LaSalle St.
Chicago 4, Ill.
(Operates also in Dist. 9)
(Af. with Zeigler Coal & Coke Co., Dist. 10)
Pres. ..... Stuart Cohen
Exec. Vice Pres. ..... W. Landon
Vice Pres. & Treas.: C. W. Peterson
Sec. ..... J. O. Hayes
Vice Pres. Sales
Warren P. Worsbure
Vice Pres. Sales Prep.
Wilford Weeks
Vice Pres. Labs. Sales ..... S. M. Rogers
Mgr. Sales ..... Wm. H. Sutton
Asst. to Pres. ..... M. K. Walsh
Asst. to Exec. Vice Pres.
R. C. Rasmussen
Asst. Sec. ..... J. W. Martin
Operating Office—Johnston City, Ill.
Gen. Supt. ..... Arthur Taylor
Prep. Engr. ..... Wesley Smith
Safety Dir. ..... Coy Smith
Pur. Agt. ..... J. C. Davis
Chief Elect. ..... Gilbert Bagnan
Maint. Engr. ..... Wm. McNall
Div. Auditor ..... John Branson
Controller ..... John R. Cashon
Sls. Agent, Bell & Zoller Coal Co.

Zeigler No. 3 Mine
P. O. ..... Zeigler, Franklin Co., Ill.
Sls. Pt.
Zeigler Mine, IC, CSO, MoPac
Supt. ..... George Stathura
Mine Mgr. ..... Mike Borovich
Chief Clerk ..... Ivan Thomas
Tech. Mgr. ..... Ray Carney
Slope: No. 6 Seam; 68° Th.
Prep. Equip.: Heavy Media Wash.; Hum. Jig; Air Tbl.; Calcium Freeze; Ments.; Serns.; Ldg. Bns.; Wax & Oil Spray Dust Treat.
Daily Cap. (Cleaned Coal) (2 Shifts) 3400 T.
Size Washed: 7" x 0
Sizes Air Cleaned: 1" x 0
Sizes Shipped: 7" x 3; 3" x 2; 2" x 1½"; 1½ x 1; 1½ x 16G; 1" x 16G; ¾" x 16G; ¾" x 0 Super-X
Tonnage Cleaned, 1961 651,207
Trade Name: Zeigler Superwashed
Mine Rescue: 1 MT Mine, Mech.; 7 Mbl. Ldrs.; Mechs.; 7 Mbl. Drills; 3 Rock Dust.; 7 Units Roof Bolt
Haulage Equip.: 70 Steel M. Cars; 12 Trk. Locos; CP T.O.; 14 Shuttle Cars; Motor Rail
Power Purchased: D.V. 250 D.C. Tirode 440 A.C.
Prep. Owned: Employees 250, 3 shifts; Daily Cap. 5530 T.
1963 Tonnage, 585,604

Zeigler No. 4 Mine
P. O. ..... Johnston City, Williamson Co., Ill.
Ship ..... Zeigler Mine, IC, MP & CB & Q & C & EI RRs.
Supt. ..... Dreiss Pierce
Mine Mgr. ..... Guy Robinson
Asst. ..... Raymond Gothard
Deputy Clerk ..... John Aaron
Elect. ..... Charles Crossroad
Prep. Mgr. ..... Chester Hilderbrand
Slope: No. 6; 36° Th.
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: McNally-Pit. Wash. ovr; Dalster Tbls.; Thermal Dryers; Shkr.; Vib. Scrns.; Crusher; Ldg. Bins; Ments.; Oil Dust Treat.; Calcium Freeze Proof
Daily Cap. (Cleaned Coal) (2 Shifts) ..... 6000 T.
Sizes Washed: 7" x 0
Sizes Dried: 1" x 0
Sizes Shipped: 7" x 3", 3" x 2", 2" x 1½", 1½" x 1", 1" x ¾", ¾" x 16M; ¾" x 0
Tonnage Cleaned, 1961 ..1,197,826
Trade Name: Zeigler Superwashed
Mine Rescue: 6 MSE, Ldrs.; 5 Cont. Miners; Rock Dust.; 2 Units Roof Bolt. Provide nearest mine.
Haulage Equip.: Conveyrs.; 16 Shuttle Cars
Power Purchased: 3500 KVA D.V. 5.2 D.C. 7200 v 440 ...
Prep. Owned: ... 2 shifts
1963 Tonnage, 1,0[illegible]6,431

Murdock Mine
P. O. ... Murdock, Douglas Co., Ill.
Ship ..... Murdock ... C RR.
Supt. .... Williams
Prep. Mgr. ..... K. W. Neibch
Supply Clerk ..... Ray Janet
Chief Elect. ..... Harry Becker
Shaft: Murdock Seam, 54° Th.
Prep. Equip.: Crusher; Shkr. Scrns.; Jig Washers; Oil Spray Dust Treat.; Calcium Freeze Proof; Pit. Tbls.; Ldr. Bins.
Daily Cap. (Cleaned Coal) (2 Shifts) ..... 2500 T.
Sizes Washed: 6 x 0
Sizes Shipped: Over 6", over 3", 6 x 1½, 3 x 1½, 1½ x ¾, 1 x ¾, 1½ x ¾
Tonnage Cleaned, 1961 571,133
Trade Name: Murdock Superwashed
Mine Rescue: 2 Cut. Machs.; 4 Ldrs.; 3 Drills
Haulage Equip.: 42" T.G.; 3 Shuttle Cars; Conveyrs.
Power Pur.: 250 D.C., 440 A.C.
Prep. Owned: Employees 65; 2 shifts; Daily Cap. 2500 T.
1963 Tonnage, 527,417

For additional data, see page 432

BELLE VALLEY COAL CO.
R.D. 1, Belleville, Ill.
Pres. & Gen. Mgr. ... C. O. Eisbi
Chief Engr. ..... H. W. Fiscel
Sales Agts.:
Schleifer & Associates

Belle Valley Mine
Ship ..... Belleville, St. Clair Co., L&N, RR.
Supt. ..... Kenneth Wall
Elect. ..... Roland Fish
Chief Clerk ..... C. H. Deaton
Tipple Foreman ..... Edward Williamson
Slope: No. 6 Seam; 64° Th.
Prop. Mgr. ..... Harry Kindenwiller
Designer of Plant: Wemco, St. Louis
Prep. Equip.: WEC; Heavy Media Washer; Crusher; Sizemix
Daily Cap. (Cleaned Coal) ...600 T.
Sizes: 6 x 0; 3 x ¾; 1½ x ¾; ¾ x 3/16
Sizes Shipped: Lge. Mesh; 6 Th. Lump; T.O. 427; 16-3 ton steel cars
Power Purchased: D.V. 120 D.C.
Employees 40; 2 shifts; Life Expec. 10 yrs.; Daily Cap. 600 T.
1963 Tonnage, 71,180

BLUE BIRD COAL CO.
226 So. Michigan Ave.
Chicago, Ill.
Chm. Bd. ..... T. H. Cochran
Pres. ..... Richard B. Cochran
Sales Agt.: Ender Coal & Coke Co.

Blue Bird No. 8 Mine
P. O. ..... Harrisburg, Saline Co., Ill.
Ship ..... Harrisburg: NYC RR.
Pur. Agt. ..... E. Hess
Slope: No. 8 Seam; 34° Th.
Prep. Equip.: Dalster Tbls.; Cyclones
Wh. Shkr. Screns.; Pit. Tbls.; Ldg. Bins.
Sizes Washed: 1½ x 16M; 1" x 16M; ¾ x 16M
Sizes Dried: ¾" x 0"

CARMAC COAL CO.
(See—Thunderbird Collieries Corp.)

CONSOLIDATION COAL CO.
TRUAX-TRAER COAL CO. DIV.
111 No. Wabash Ave.
Chicago 2, Ill.
(See also K. D.)
Pres. ..... H. C. Livingston
Vice Pres. (Oper.) ..... H. M. Tibbs
Vice Pres. & Sec.
Henry B. Pfahl, Jr.
Vice Pres. (Sales) ..... Jack H. Price
Admin. Asst. to Vice Pres. (Oper.)
Clem E. Fowler
Gen. Sls. Mgr. ..... B. E. Herbster
Controller ..... G. R. Zagaris
Coal Supt. ..... M. H. Shumate
1961 Company Production, 5,601,308
Sales Agts., Truax-Traer Coal Co. Div., Consolidation Coal Co.

Burnside Star No. 1 Mine
P. O. ..... DuQuoin, Perry Co., Ill.
Ship ..... Pinckneyville, IC & MP RRs.
Gen. Mgr. ..... R. E. Henderson
Asst. Gen. Mgr. ..... C. D. Heatherly
Supt. (Strip Mine) ..... J. A. Martin
Supt. (Strip Mine) ..... Ralph T. Trollver
Engr. ..... William J. Winters
Supply Clerk ..... T. W. Carruthers
Elects. ..... C. A. Tyner
Prep. Mgr. ..... J. L. Dyer
M. Mech. ..... H. L. Sager
Slope: No. 6 seam; 64° Th.
Strip: No. 6 seam; 62° Th.
Prep. Equip.: McNally Wash.; Rot. Brkr.; Raw Coal Storage; Oil Dust. Treat.; Vibrac Heat Driers; CMI Driers
Mine Equip.: (Strip) 1 Power Shovel; 1 Dragline; 6 Tractors; 1 Overburden Drill; 2 Ldrs. (Drill); 4 Misc. mach.; 4 loading mach.; 8 Coal Drills; 1 Cont. Miner; 8 Roof Drills
Haulage Equip.: (Strip) 6 Tractor-Trailer Units; (Drift) 8 Shuttle cars; Belts; 42" conveyrs.
Power pur.: 34,500/4160/440 A.C.
Prep. owned: Life expectancy 10 yrs.; 1 shift; 1000 T. Coal
1963 Tonnage, 933,661

Burnside Star No. 2 Mine
P. O. ..... DuQuoin, Perry Co., Ill.
Ship ..... Pinckneyville, IC & MP RRs.
Gen. Mgr. ..... R. E. Henderson
Asst. Gen. Mgr. ..... C. D. Heatherly
Supt. ..... H. M. Clark
Engr. ..... William J. Winters
Prep. Pl. Foreman ..... John E. Robinson
Supply Clerk ..... Mell Rice
Elec. ..... Tshaka Hattori
M. Mech. ..... H. L. Sinser
Prep. Mgr. ..... J. L. Dyer
Slope: No. 6 seam; 60° to 66° Th.
Prep. Equip.: McNally Wash.; Rot. Brkr.; Raw Coal Storage; Oil Dust. Treat.; Vibrac Heat Driers; CMI Driers
Mine Equip.: 1 Strp. & 1 Ldg. Shvls.; 2 Orville Drills
Haulage Equip.: 18 Tractor-Trailer & Tractors; 12 Pusher
Power Pur.: Dist. Volt. A.C. 34,500/7200/400
Prep. Owned: Life Expec. 20 yrs.; Full Daily Cap. 6000 T.; 1 shift
1963 Tonnage, 1,561,627

Red Ember Mine
P. O. ..... Pinckneyville, Perry Co., Ill.
Ship ..... Pinck. C&EI RR.
Gen. Mgr. ..... Gene Long
Gen. Supt. ..... J. G. Reis
Engr. ..... L. Fisher
M. Mech. Supt. ..... Ray Lowery
M. Mech. ..... Elmer McCann
Prep. Engr. ..... J. L. Dyer
Supply Clerk ..... Lyle Bengtson
Strip: No. 6 seam; 54° Th.
Designer of Plant: McNally-Pittsburg Mfg. Co.
Prep. Equip.: Norton washers; oil dustproofing treatment; Crusher; Vib. & Shkr. Screens; Ldg. Bins; Ments.; Vibrac Driers; CMI Driers
Daily Cap. (Cleaned Coal) ...7000 T
Sizes Washed: 6" x 0
Sizes Dried: 1" x 0
Sizes Made: 6" x 4"; 4" x 3"; 3" x 1½"; 1" x 0
Mine Equip.: 2 Strp. & 3 Ldg. Shvls.; 1 Dragl.; 3 Wh. Excavs.
Haulage Equip.: 17 Trucks, 6 Tractrs.
Power Pur.: Dist. Volt 34,500/4160 440 A.C.
Prep. owned & leased: Life Expectancy 20 yrs.; 1 shift; 1000 T. daily
1963 Tonnage, 1,618,033

For additional data, see pages 441, 618, 37, 68, 140, 158, 225, 239, 301, 453, 494, 498, 512, 513, 562, 563, 572, 573

DELTA COAL CORPORATION
(See—Thunderbird Collieries Corp.)

EGYPTIAN MINING CO.
28 S. Main St., Harrisburg, Ill.
Pres. ..... Robert E. Brandt

4941
1131
DEFENDANT'S EXHIBIT
241

STATE OF ILLINOIS
RICHARD B. OGILVIE, *Governor*

1968 Annual Coal, Oil and Gas Report
DEPARTMENT OF MINES AND MINERALS

15

MINES SUSPENDING OPERATIONS DURING 1968 SHOWING MONTH OF LAST OPERATION

[illegible] No.	Operator	County	Month of last operation
[illegible]	[illegible] Coal Company [illegible] Coal Company [illegible] Lime Coal Corp. #6	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]

MINES ABANDONED DURING 1968 SHOWING MONTH OF LAST OPERATION

[illegible] No.	Operator	County	Month of last operation
[illegible]	[illegible] Coal Company, Inc. #1 [illegible] Coal Co. (Tipton Mine #1) [illegible] Coal & Channel Company [illegible] Coal Co., Inc. [illegible] Coal Co. #6 [illegible] Coal Co., #6 [illegible] Coal Co. (Cooper #6) [illegible] Coal Co., #6 [illegible] Coal Corp., #6 [illegible] Coal Co. (Valley Highwall Mine) [illegible] Coal Co., Inc., #1	[illegible]	[illegible]

NEW MINES OPENED — 1968

[illegible] No.	Operator	County	Month Opened
[illegible]	[illegible] Coal Company #6 [illegible] Coal Company #1 (Auger Mine)	[illegible] [illegible]	[illegible] [illegible]

1133 ~~1949~~

DEFENDANT'S EXHIBIT 242

ALPHA PORTLAND CEMENT COMPANY
15 SOUTH THIRD STREET
EASTON, PA.

R. E. HARTMANN
VICE PRESIDENT
AND SECRETARY

January 22, 1969

Department of Justice
Room 2634 - United States Courthouse
Chicago, Illinois 60604

RE: U.S. vs. General Dynamics Corporation et al.,
Civil Action No. 67 C 1632 (N.D. Ill.)

Gentlemen:

This will reply to your letter of January 10, 1969 requesting additional information relative to the above-captioned case.

During the period 1964 through 1967 this company used, at the St. Louis, Missouri and LaSalle, Illinois plants, for the purpose for which coal is required, the below listed quantities of gas at the costs as reflected:

	ST. LOUIS		LA SALLE	
	Cu. Ft.	Amount	Cu. Ft.	Amount
1964	1,464,302,000	$334,215	-	$ -
1965	1,861,883,000	400,266	-	-
1966	1,620,065,000	348,314	290,760,200	91,360
1967	1,634,518,000	364,471	384,321,100	109,356

It has been our usual practice to consume gas at the St. Louis plant during the approximate period April 1 to October 31 of each year as an economically advantageous rate structure is available to the company during that period.

DEPARTMENT OF JUSTICE
JAN 24 1969
DIVISION OF INVESTIGATION

SHEET NO. 2 ALPHA PORTLAND CEMENT CO.

TO Department of Justice January 22, 1969

The use of gas at the LaSalle plant was commenced in 1966 to permit the economic evaluation of such fuel as an alternative to coal as well as to permit the repair and rebuilding of coal preparation equipment at that plant.

Very truly yours,

REH/fm

1135

DEFENDANT'S EXHIBIT 243

WISCONSIN ELECTRIC POWER COMPANY
231 WEST MICHIGAN STREET
MILWAUKEE, WISCONSIN 53201

May 21, 1968

Mr. John T. Cusack
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634, United States Courthouse
Chicago, Illinois 60604

60-0-37-920
DEPARTMENT OF JUSTICE
MAY 22 1968
DIVISION OF RECORDS

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N.D. Ill.)
60-0-37-920

Dear Mr. Cusack:

This is in reply to your letter of April 9 addressed to Mr. C. F. John requesting information in regard to the above referenced civil action.

The information requested in paragraphs 1 and 2 of your letter is detailed in Tables I and II attached. All coal purchased for the following generating stations for the years 1964 through 1967 was delivered to storage docks by lake vessels during the navigation season for Lake Michigan, which normally extends from April 1 to December 1 each year:

Oak Creek Power Plant
Port Washington Power Plant
Commerce Street Power Plant
East Wells Street Power Plant

This coal was consumed approximately from mid-April of the year in which it was delivered to mid-April of the following year. Coal purchased for use at our Lakeside Power Plant for the same years was consumed during the calendar year in which it was purchased. The footnote : of Tables I and II explain the variance in the period coal was purchased and consumed.

In response to your paragraph 3, during the referenced period facilities for generating electricity by utilizing oil and gas were available at the Commerce Street Power Plant. Details in regard to gas and oil consumption are given in Table III attached. Boiler #25 of this plant is the only unit so equipped and was equipped to burn gas or oil exclusively since November, 1964. This unit has a capability of 22,000 kw

when supplying 230,000 lbs. per hour of steam for our heating utility. The footnotes to Table III explain the seasonal usage of gas and oil and the portion of each used for steam production at this plant.

In response to paragraph 4, no facilities were available for generating electricity by nuclear energy through the years 1964 through 1967.

Facilities for generating electricity from other sources as requested in paragraph 5 are limited to hydroelectric and diesel plants of Wisconsin Michigan Power Company, a wholly owned subsidiary of Wisconsin Electric Power Company. The information which you requested regarding these facilities is given in Table IV attached.

Data in response to paragraph 6 of your letter are not available.

You will note from the several documents attached that the majority of our coal is derived from mines in Illinois and western Kentucky. We believe that the acquisition by General Dynamics Corporation of the United Electric Coal Companies made it possible for the latter companies to have available financial resources for the development of mining properties and to increase the availability of coal sources from these regions.

You may wish to correct your records to indicate that Mr. C. F. John retired as Vice President in Charge of Power on December 31, 1965.

Very truly yours,

Robert H. Gorske

Robert H. Gorske General Counsel

Attach.

PAUL WEIR, FOUNDER
CONSULTANT

1917 CABLE ADDRESS "WEIRCO"

DEFENDANT'S EXHIBIT 252

PAUL WEIR COMPANY
INCORPORATED
MINING ENGINEERS AND GEOLOGISTS
(312) 346-0275
80 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

CLAYTON G. HALL, CHAIRMAN OF THE BOARD
JOHN P. WEIR, PRESIDENT
JOHN E. GOOD, SENIOR VICE PRESIDENT
JOHN S. SNYDER, COMPTROLLER

VICE PRESIDENTS
RAYMOND E. ZIMMERMAN
ERWIN GAMMETER
DONALD H. DOWLIN
DAVID J. KACHIK
GEORGE W. BOUFFER
GERALD C. CLARK

June 8, 1970

Mr. Reuben L. Hedlund
Kirkland, Ellis, Hodson,
Chaffetz & Masters
2900 Prudential Plaza
Chicago, Illinois 60601

Dear Mr. Hedlund:

In regard to the United States v. General Dynamics litigation, it is my understanding that the Department of Justice has introduced into evidence an excerpt of the 1951 study made by the Paul Weir Company under subcontract to the United States Army Corps of Engineers. Apparently, the excerpt in question, entitled "Coal Data Sheets Showing Recoverable Coal Reserves In Illinois Available For Commercial Use And Synthetic Liquid Fuels Manufacture", has been designated Government Exhibit No. 308 and has been introduced to place in issue the estimated "Recoverable Strip Coal Reserves" in Illinois contained therein. It is the position of the Paul Weir Company that the conclusions relating to Illinois strip reserves reached in that report were valid ones, when viewed in light of the parameters of that report and the limitations inherent in the underlying data at that time. It is the purpose of this letter to delineate these matters so that the summary report offered into evidence may be viewed in its proper context.

First, the survey made for the Corps of Engineers was national in scope and included information on four raw materials, only one of which was coal. The Paul Weir Company received the coal subcontract from the prime contractor, Ford, Bacon & Davis. We collected information on coal deposits in 24 states. The Illinois report, from which GX No. 308 is taken, is contained in two main volumes and one supplement.

The excerpt which constitutes the trial exhibit is only one part of the supplementary volume, which also contains detailed statistical charts and tables on a township by township basis. Thus, it can be readily seen that the brief excerpt submitted into evidence is but a small portion of the published material concerning Illinois coal made by Paul Weir Company for this study.

Secondly, our performance under the terms of the subcontract was confined to a study of information obtainable from then-existing published material, and there was no authorization for any field studies or primary research. Thus, the sources for our report and its conclusions were eclectic in nature. It is our belief that this report was the first such comprehensive digest of existing data on coal reserves in the State of Illinois. This report was completed two years before the principal reserve study of the Illinois Geological Survey was undertaken; and, of course, the definitive survey of Illinois strip reserves made by the IGS was not commenced until 1957, seven years after the publication date of the report in question. In 1950, the only published materials which pertained exclusively to Illinois strip reserves and which were available for our use were two Illinois Geological Survey reports, published in 1926 and 1929 respectively, which reported the occurrence of strip coal in two very localized areas of the state and a series of reconnaissance maps prepared by the Department of Agriculture in 1946 and 1947.

Thirdly, in addition to technological innovations and developments in the strip mining industry, the development of more precise and accurate information-gathering techniques in the last twenty years also accounts for the discrepancy between our 1951 recoverable strip reserve estimate and an equivalent figure of today. For example, at that time, all geological maps were charted on about a one" to one mile scale and at a 15 minute quadrangle variant. In contrast, maps drawn on a one":2000' scale and on a 7-1/2 minute quadrangle variant are available today. Such breakthroughs in data collection increased the body of knowledge of coal

reserves substantially and necessarily make more precise estimates based thereon. Such an increment in accumulated data specifically enhance the reliability of strip coal reserve estimates. As was stated at page 57 of Volume I of the 1951 report, "In estimating strippable reserves, the amount and character of the available information are relatively much more important than in estimating underground reserves, because of the determinative interdependence of factors, such as the thickness and continuity of coal bed and the thickness and character of overburden in a relatively small proportion of the general coal-bearing area."

Finally, the terms of our subcontract set definitional limits as to what reserves were to be considered "strippable." Although this provision established the maximum depth for "strip reserves," the contract anticipated the problems inherent in reaching conclusions based upon derivative sources of information and provided that reserves lesser in depth could be defined as "underground coal" in the judgment of the subcontractor. Accordingly, commensurate with the degree of reliability of the given underlying data and the purpose of the assignment, Paul Weir Company classified some reserves as "deep" rather than "strip," when information on intermediate categories of deposits was insufficient.

When the above-mentioned facts are taken into consideration, we feel that the 1951 estimate is consistent with the purposes of the assignment undertaken by the Paul Weir Company and that comparisons between its conclusions and contemporary knowledge are meaningless.

Sincerely,

Clayton G. Ball

Clayton G. Ball
Chairman of the Board
Paul Weir Company

CGB/

ABATEMENT OF SULFUR OXIDE EMISSIONS FROM STATIONARY COMBUSTION SOURCES

Prepared by
Ad Hoc Panel on Control of Sulfur Dioxide from Stationary Combustion Sources
Committee on Air Quality Management
Committees on Pollution Abatement and Control
Division of Engineering
National Research Council

Washington, D.C.
1970

This is the report of a study undertaken by the Committee on Air Quality Management *Ad Hoc* Panel on Control of Sulfur Oxide from Stationary Combustion Sources for the National Academy of Engineering in execution of work under Contract No. CPA 22-69-31 with the National Air Pollution Control Administration, Consumer Protection and Environmental Health Service, Public Health Service, U.S. Department of Health, Education, and Welfare.

As a part of the Division of Engineering of the National Research Council, the Committees on Pollution Abatement and Control perform study, evaluation, or advisory functions through groups composed of individuals selected from academic, governmental, and industrial sources for their competence and interest in the subject under consideration. Members of these groups serve as individuals contributing their personal knowledge and judgments and not as representatives of any organization in which they are employed or with which they may be associated.

PREFACE

Because the air, water, and land on earth are limited, we, as a nation, must plan and work together to ensure the preservation of an acceptable environment. In this report of a study on the control of sulfur oxide emissions into the atmosphere, primarily from electricity generating stations, an effort has been made to place the findings of the study in perspective with the entire problem of environmental quality management.

On the basis of problem definition, a study of need, a study of engineering constraints, and an analysis of technological requirements and alternatives, this report outlines a government-industry program for research, development, and demonstration of potential control processes.

No attempt has been made, however, to deal with such problems of sulfur oxide emissions as their effect on health and other biological aspects. Important though such studies may be, they are outside the scope of the *Ad Hoc* Panel on Control of Sulfur Oxide from Stationary Combustion Sources.

The members of the panel, along with the members of the Committee on Air Quality Management, share the objectives of the Congress as representing the determination of the people to restore and maintain the quality of our air resources and the objectives of the National Air Pollution Control Administration of the Department of Health, Education, and Welfare as the Federal "lead agency" to assure significant progress by an early date. The panel hopes that the results of its study will be useful in the attainment of these objectives.

The panel's estimation of the present status of sulfur control technology is based primarily on presentations by 23 research and industrial organizations that came to Washington to discuss the results of their process studies and their proposals for further

work. In addition, 23 other organizations provided information by correspondence.

The panel appreciates the cooperation received from industrial and research organizations with active programs in sulfur oxide control. The panel is particularly grateful to Mr. Paul W. Spaite, Director, Bureau of Engineering and Physical Sciences, National Air Pollution Control Administration, and his staff for their outstanding support.

A summary of the study and a brief statement of conclusions are presented first in the report for the benefit of those who may wish to gain an overview of the panel's efforts. These are followed by an introduction covering the background of the study, the roles of the National Academy of Sciences and the National Academy of Engineering, and the nature of the sulfur oxide emissions problem. The remaining sections of the report cover the impact of the nation's growing requirements for electricity upon the sulfur oxide emissions problem and review the possibilities for abatement of sulfur oxide emissions through the widespread use of nuclear power plants, the use of sulfur-free or low-sulfur fuels, and the development and application of technology to control sulfur oxide emissions. A strategy for the research, development, and demonstration of this technology is presented.

Appendixes to the report contain lists of organizations that made presentations and correspondents who supplied information for the study, lists of research and development activities in sulfur oxide pollution control in the United States and abroad, and a selective bibliography.

It is hoped this report will provide a basis for increased governmental and public understanding of the problems of sulfur oxide abatement and control, and will direct attention and adequate assignment of resources to the orderly and expeditious solution of this portion of the nation's problems of environmental quality management.

Thomas H. Chilton, *Chairman*

NATIONAL ACADEMY OF SCIENCES-
NATIONAL ACADEMY OF ENGINEERING
NATIONAL RESEARCH COUNCIL
Division of Engineering

COMMITTEE ON AIR QUALITY MANAGEMENT
AD HOC PANEL ON CONTROL OF SULFUR OXIDE
FROM STATIONARY COMBUSTION SOURCES

Thomas H. Chilton, Retired, E.I. du Pont de Nemours & Co., Inc., *Chairman*
Richard E. Chaddock, Hercules Incorporated
Vance R. Cooper, General Electric Company
George T. Cowherd, Jr., Consolidated Edison Co. of New York, Inc.
H. L. Falkenberry, Tennessee Valley Authority
C. Howard Hardesty, Continental Oil Company
Robert L. Hershey, Retired, E.I. du Pont de Nemours & Co., Inc.
R. M. Lundberg, Commonwealth Edison Company
Robert L. Pigford, University of California, Berkeley
Elliott J. Roberts, Dorr-Oliver, Incorporated
Thomas K. Sherwood, Retired, Massachusetts Institute of Technology, *Ex Officio*
Jack A. Simon, Illinois State Geological Survey

Staff

R. W. Crozier, *Executive Secretary*, Committees on Pollution Abatement and Control, National Research Council
J. M. Marchello, *Staff Engineer*, Committees on Pollution Abatement and Control, National Research Council
Donnell H. Nicchitta, Administrative Secretary, Committees on Pollution Abatement and Control, National Research Council

Liaison Representative-NAPCA

Paul W. Spaite, Director, Bureau of Engineering and Physical Sciences, National Air Pollution Control Administration, U.S. Department of Health, Education and Welfare

CONTENTS

I. SUMMARY AND CONCLUSIONS 1

II. INTRODUCTION. 6
A. Background of the Study 6
B. The Roles of the National Academy of Sciences and the National Academy of Engineering 9
C. Nature of the Sulfur Oxide Problem 10

III. ENERGY REQUIREMENTS AND AIR POLLUTION CONTROL 12
A. Electricity Generation 12
B. Sulfur Oxide Emissions 14
C. Shifting Generation 19
D. A National Electric Transmission Grid. 20
E. Long-Term Environmental Considerations. 21

IV. ENERGY RESEARCH 23

V. FACTORS OF FUELS UTILIZATION 27

VI. TIME PHASES OF TECHNICAL DEVELOPMENTS 30

VII. SUPPORT OF TECHNOLOGICAL PROGRESS 33
A. Coal Industry 33
B. Equipment Manufacturers 34
C. Utility Companies 34
D. Federal Government. 36

VIII. PRESENT STATUS OF RESEARCH AND TECHNOLOGY. 38
A. Availability of Technology 38
B. The Need for Commercial Demonstration . . . 42
C. Back-Fitting Existing Plants. 44
D. Central Recovery Facility 45
E. Research Planning 46
F. Process Development 50
1. General Considerations of Individual Processes 50
2. Precombustion Processes 52

a. Coal Cleaning. 52
b. Coal Gasification. 53
3. Combustion Processes 55
a. Fluidized Bed Combustion (FBC) . . . 55
b. The Black, Sivalls, and Bryson Combustion Process 56
4. Limestone Processes. 56
a. Limestone-Wet Scrubbing. 57
b. Limestone-Dry Removal. 58
5. Processes for Sulfur Recovery from Stack Gases. 58
a. The Cat-Ox Process 59
b. The Wellman-Lord Process 59
c. The Esso-Babcock and Wilcox Adsorbent Process. 59
d. Magnesium Oxide Scrubbing. 60
e. The Formate Scrubbing Process. . . . 60
f. Ammonia Scrubbing. 60
g. The Westvaco Char Process. 60
h. The Molten Carbonate Process 60
i. Sodium Bicarbonate Adsorption. . . . 61
j. The Modified Claus Process 61
k. The Catalytic Chamber Process. . . . 61
l. The Ionics/Stone & Webster Process . 61
m. The Alkalized Alumina Process. . . . 61
6. Scrubber Development 61

TABLES

1. Estimated potential sulfur dioxide pollution without abatement in the United States. 16

2. Federal research and development expenditures by primary energy sources. 25

FIGURES

1. Projected power generating capacity and fuel sources of electric utilities in the United States (with breeder). . . 13

2. Comparison between projections for total power plant uncontrolled SO_2 emissions. 18

3. Time scale for process development 51

APPENDIXES

A. List of Presenters 63

B. List of Correspondents 64

C. United States SO_2 Pollution Control Research and Development 65

D. Foreign SO_2 Pollution Control Research and Development 69

E. Bibliography 72

I

SUMMARY AND CONCLUSIONS

Controlling and improving the quality of our environmental resources is a growing concern of the nation. National and regional goals and standards for air quality management are being defined. Capital investments of billions of dollars will be required to install processes to meet these standards. Keeping these costs within bounds, while still attaining an acceptable level of control within the shortest practical period of time, will call for the best efforts and most careful planning at all levels from individuals, civic groups, and companies through local, regional, state, and Federal agencies.

The emission of SO_2* from combustion of sulfur-bearing coal and oil, primarily for the generation of electrical energy, is second only to the emission of pollutants from internal combustion engines in quantity of pollutants discharged to the national air environment.

During the next 20 years, the national requirement for electrical energy is expected to more than triple. The supply of natural gas, a low-sulfur fuel, is expected to decrease in about 10 years, and petroleum products may reach their maximum availability in about 30 years. To supply the needed electricity, the use of coal is expected to triple by the year 2000, when it is expected that the use of nuclear energy will about equal the use of coal, after which the requirement for coal will start a downward trend.

The substitution of low-sulfur fuels, the only presently available method for reducing SO_2 emissions, is restricted by the limited availability

---

*The symbol SO_2 is used in this report to designate the sulfur oxides in stack gases (SO_2 plus 1 percent to 2 percent of SO_3).

of natural gas, low-sulfur oil, and low-sulfur coal. More rapid expansion of the application of nuclear energy is constrained by engineering and economic problems, in addition to siting problems, that are of growing concern to all planning of major electricity generating installations. By the late 1980's, new fossil-fueled plants may employ magnetohydrodynamic (MHD) generators, followed by conventional steam boilers or by advanced Brayton or Rankine power cycles. The combined energy conversion efficiency of such plants is expected to be in the range of 50 percent to 60 percent compared with about 40 percent for conventional plants, which would result in a corresponding decrease in SO_2 emissions. However, the high operating temperature of MHD units may result in increased NO_x emissions.

In addition to improving the energy conversion efficiency, the fast breeder nuclear reactor produces a net gain of fissionable material and thereby reduces the net cost of fuel. The Atomic Energy Commission is planning a 500 MW fast breeder demonstration plant for 1976 and expects the first commercial units to start up about 1985 in the United States.

Therefore, *the reduction of SO_2 emissions from stationary combustion sources, in the next 5 to 20 years, will depend very largely on the development, demonstration, and application of a combination of technologies designed to prevent the sulfur in coal and petroleum products from reaching the atmosphere through the combustion processes.*

The technology for removal of sulfur from oil is being developed by a number of oil companies, and the panel does not believe that NAPCA should contribute significantly to these developments.

Although broader application and refinement of existing technology could increase the quantity of low-sulfur coal available, there are no cleaning or washing processes presently in sight that have the potential for substantially reducing sulfur content below levels presently being achieved. This emphasizes

the need for new concepts in engineering and chemical approaches to the desulfurization of coal.

In addition to joint support by groups of utilities, a number of industrial organizations have committed significant funds to research, development, and demonstration of sulfur emission control processes and equipment. An increase in these activities, together with increased support by the Federal Government, is needed.

The panel reviewed the status of United States and foreign sulfur oxide abatement and control processes and firmly concluded that, *contrary to widely held belief, commercially proven technology for control of sulfur oxides from combustion processes does not exist.*

Efforts to force the broad-scale installation of unproven processes would be unwise; the operating risks are too great to justify such action, and there is a real danger that such efforts would, in the end, delay effective SO_2 emission control. *A high level of government support is needed for several years to encourage research, engineering development, and demonstration of a variety of the more promising processes, as may be suited to specific local and regional conditions, to bring these processes to full-scale operating efficiency at the earliest practical date. This can be done most expeditiously if Federal support, in addition to industry commitments, is provided at the appropriate time and in the needed amounts.*

Federal support for the development of the following control approaches is suggested:

1. "Throw-away" processes for removal of SO_2 from stack gases, such as limestone injection, which produce a presently nonmarketable product

2. New combustion concepts, such as fluidized bed combustion (FBC), which fixes the sulfur as a sulfate during combus-

tion and prevents its release as SO_2 to the stack

3. Chemical recovery processes, which produce salable SO_2, sulfuric acid, elemental sulfur, or fertilizers

4. Coal gasification processes, which produce sulfur-free fuels

5. New concepts in engineering and chemical approaches to the desulfurization of coal

The limestone injection processes, with adequate particulate control, should be commercially demonstrated within the next 1 to 3 years and, if successful, can be installed in many existing plants.

Several sulfur-recovery processes appear to be ready for scale-up to commercial demonstration size (100,000 kW or larger boilers). Full-scale demonstration of the industrial reliability of these processes is 4 to 10 years away. Some of them can be installed in a portion of existing plants or engineered into future plants.

New combustion technology may be available for industrial application in 5 to 10 years. Efficient coal gasification processes, which are 5 to 10 years away, have the potential for producing pipeline-quality, low-sulfur gas for supplementing existing supplies of natural gas or for producing a product of less than pipeline-quality, but adequate for power generation. Such fuels seem likely to become increasingly competitive for use in power production as the cost for controlling all pollutants (SO_2, NO_x, and fine particulates) increases the costs for conventional systems.

These time estimates are realistic only if there is dedication and a positive commitment on the part of government agencies, utilities, fuel suppliers, and equipment manufacturers to support the orderly

development and timely application of the more promising processes.

In recommending a 5-year plan for future work, the panel places special emphasis on the following:

1. Complete development of the limestone process should be given high priority because it is applicable to many existing boilers and is closer than others to demonstrated industrial application.

2. For new power plants and some existing plants, it is expected that sulfur-recovery processes will be necessary to keep costs for future control within reasonable limits.

3. NAPCA should continue to support the development and demonstration of new concepts in combustion technology, sulfur-recovery, and coal-desulfurization processes.

4. Research should be supported on ways to combine the abatement of nitrogen oxide and particulates with sulfur oxide control.

5. Elemental sulfur is a more desirable by-product than sulfuric acid or sulfur dioxide. The conversion of sulfur dioxide to sulfur is not a well established process, and it is important that the technology and costs of this conversion be thoroughly studied.

6. NAPCA should employ a *process engineering and construction firm* to project costs on a *common basis* for all the promising processes at various stages in their development to aid in making scale-up decisions.

II

INTRODUCTION

A. BACKGROUND OF THE STUDY

The concern of Americans for the deterioration of the nation's air resources is reflected in Public Law 90-148 as amended, the Air Quality Act of 1967, enacted by the 90th Congress on November 21, 1967. Responsibility for carrying out the provisions of the law is assigned to the Secretary of the Department of Health, Education, and Welfare.

The purposes of the Act are set forth in Section 101(b) as:

1. to protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and the productive capacity of its population;

2. to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution;

3. to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and

4. to encourage and assist the development and operation of regional air pollution control programs.

Special emphasis (Section 104) is given to research and development into new and improved methods for the prevention and control of air pollution resulting from the combustion of fuels. In addition to providing for laboratory and pilot plant testing, Section 104(a)(4) calls upon the Secretary of the Department of Health, Education, and Welfare to "con-

struct, operate, and maintain, or assist in meeting the cost of the construction, operation and maintenance of new or improved demonstration plants or processes which have promise of accomplishing the purposes of this Act."

The Clean Air Act recognizes the regional nature of air pollution problems. One of the functions of the Federal Government under the 1967 legislation is the designation of air quality control regions in all those areas in which air pollution constitutes a serious threat to health and welfare. Once air quality regions are designated, and NAPCA has issued criteria documents describing the harmful effects of specific pollutants, together with documents describing techniques for controlling the pollutants, it becomes the responsibility of the states in the regions to develop air quality standards and plans for enforcing them. In 1969, NAPCA issued criteria on two of the major pollutants--particulate matter and the sulfur oxides--together with the required supporting documents on techniques available for preventing and controlling their emission into the atmosphere. In March 1970, NAPCA issued air quality criteria and recommended control techniques for carbon monoxide, photochemical oxidants, and hydrocarbons.[16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26]*

The Clean Air Act, as amended, states in Section 101(a)(3) "that the prevention and control of air pollution at its source is the primary responsibility of State and local governments," in Section 101 (a)(4) "that Federal financial assistance and leadership is essential for the development of cooperative Federal, State, regional, and local programs to prevent and control air pollution," and, in Section 101 (b)(4), that a major purpose of the Act is "to encourage and assist the development and operation of regional air pollution control programs."

Federal assistance is provided in two major ways--financial and technical. Financial assistance

---

*Refer to numbered items in the bibliography contained in Appendix E of this report.

to air pollution control agencies is authorized under Section 105 of the Act. Under Section 106, financial assistance for planning for air quality standards and implementation plans in interstate air quality control regions is authorized.

The National Air Pollution Control Administration also provides technical assistance in conducting emission inventories, air quality monitoring and data analysis, and diffusion modeling. Diffusion modeling involves combining meteorological and emission data to predict air quality. These services are particularly helpful in attempting to test various emission reduction strategies.

The Air Quality Act of 1967 has created a new role for the Federal Government in air pollution control. The Act states that air quality standards that the states develop for an air quality control region become effective when the Secretary of the Department of Health, Education, and Welfare determines that such standards are "consistent with the air quality criteria," and it states that an implementation plan becomes effective when the Secretary determines "that the plan is consistent with the purposes of the Act insofar as it assures achieving such standards of air quality within a reasonable time."

What may be considered a "reasonable time" for attainment of an air quality standard will depend on a number of factors, including the availability of applicable control techniques and, particularly, the nature and seriousness of the adverse effects of the pollutants involved. Every implementation plan must include a timetable for reaching compliance with the projected requirements for the prevention, abatement, and control of air pollution. This timetable must provide for meaningful increments of progress over relatively short intervals, such as 1-year or 2-year periods, during the total timespan covered by the implementation plan.

B. THE ROLES OF THE NATIONAL ACADEMY OF SCIENCES AND THE NATIONAL ACADEMY OF ENGINEERING

The National Academy of Sciences and the National Academy of Engineering established the Environmental Studies Board in 1967 to coordinate activities of the two Academies in the environmental field. One of the first acts of this board was to create four committees within the Division of Engineering of the National Research Council on air, water, noise, and solid waste management, respectively. These committees have an engineering orientation and are available for advice and assistance to the Congress and to agencies of the executive branch having responsibility for pollution abatement and control. Needed interaction and coordination of the committees are provided through liaison activities of the Environmental Studies Board.

On June 20, 1969, the Department of Health, Education, and Welfare, through the National Air Pollution Control Administration, requested the National Academy of Engineering to make a comprehensive review of present industry and government research and development programs directed toward control of sulfur oxides effluents from stationary sources of combustion. The requested study would include technical and economic potentials, adequacy of scope, proper integration with other similar efforts, and the responsiveness to national needs.

The request was accepted after review and coordination by the Environmental Studies Board with other environmental activities of the National Academy of Engineering and the National Academy of Sciences. The task was assigned to the National Research Council's Committee on Air Quality Management, which in turn requested its *Ad Hoc* Panel on Control of Sulfur Oxide from Stationary Combustion Sources to carry out the study.

Because meeting national energy requirements is only one of man's activities that may result in unacceptable acceleration of environmental degradation, studies of abatement technology for other sources of SO_2 and other air pollutants will be made soon.

C. NATURE OF THE SULFUR OXIDE PROBLEM

At an early meeting of the panel with Dr. John T. Middleton, Commissioner of NAPCA, and subsequent meetings with Mr. Paul W. Spaite, Director of the Bureau of Engineering and Physical Sciences of NAPCA, and other members of the NAPCA staff, the panel was presented data on projected sulfur oxides emission with various levels of control. The panel members considered these data to be realistic, based on authoritative sources, and interpreted rationally and conservatively; and the members were impressed with the magnitude and urgency of the problem of sulfur oxides emission to the atmosphere. *The data and projections gave rise to the conclusion that positive action will be required to prevent the emission of sulfur oxides into the ambient air from more than quadrupling by the year 2000.*

The requirement for electrical power is projected to increase at an annual rate of 6 percent during the next 30 years. It is generally agreed that the generation and distribution of this quantity of electrical energy, using presently available fuels and technology, will result in unacceptable levels of environmental degradation. As previously noted, the use of sulfur-bearing fuels to generate electrical energy is only one of man's activities contributing to the decline in quality of our air resources, but it is a major source of SO_2.

NAPCA chose SO_2 emitted to the atmosphere from electricity generating plants for first attention because: (1) this is the largest man-made source of sulfur oxides; (2) it is widely dispersed nationally, but is largely concentrated in or near urban centers; (3) it is growing at about 6 percent per year; (4) it is intimately related to the national and international flow of energy resources; (5) it is important to regional economic development; and (6) it is critical to continued national well-being, security, and economic growth. Moreover, *while national and regional goals and standards are being defined, the processing methods presently available to attain these goals are inadequate for the task.*

Worldwide emission of sulfur into the atmosphere arises from biological, geological, and industrial activity.[11] Of the man-made sources, coal and oil combustion for electricity generation accounts for about 50 percent, other combustion of coal 16 percent, other combustion of oil 9 percent, primary and secondary smelting 12 percent, petroleum refining 7 percent; and miscellaneous sources including coke and sulfuric acid production, burning coal refuse banks, and refuse incineration 6 percent.

III

ENERGY REQUIREMENTS AND AIR POLLUTION CONTROL

A review of sulfur oxide abatement and control technology gives rise to concern as to the future supply of electricity and the future availability and use of fuels. There are important matters of policy and management regarding future energy conversion and consumption that bear directly and importantly on environmental problems, such as: emission of sulfur oxides, nitrogen oxides, particulates, carbon dioxide, carbon monoxide, and other pollutants from fossil fuels combustion; thermal pollution; siting of generating facilities and distribution systems; fuels policy and availability; radioactive pollution and disposal of radioactive wastes; and technological, political, jurisdictional, and economic limitations and constraints.

Electricity generation, sulfur oxide emission control, and other environmental factors are closely interrelated and require an integrated systems approach. The objective of providing for the nation's growing power needs is subject to the constraints of maintaining environmental quality, fuels availability, and technical developments. Within this framework lie the trade-offs of shifting generation, improved transmission, and the development of control processes. Overriding all of these is the long-term consequence of each alternative.

A. ELECTRICITY GENERATION

The Federal Power Commission now states that the 1970 requirement, including reasonable reserves, for electrical generating capacity is nearly 340 million kW. This requirement is expected to be nearly double by 1980 and to exceed 1 billion kW in 1990.

Figure 1 shows the electricity generation and fuels utilization forecast (assuming early development of the breeder reactor). At present, about 65 percent of the energy for electricity generation comes from coal, with natural gas and oil supplying most of the

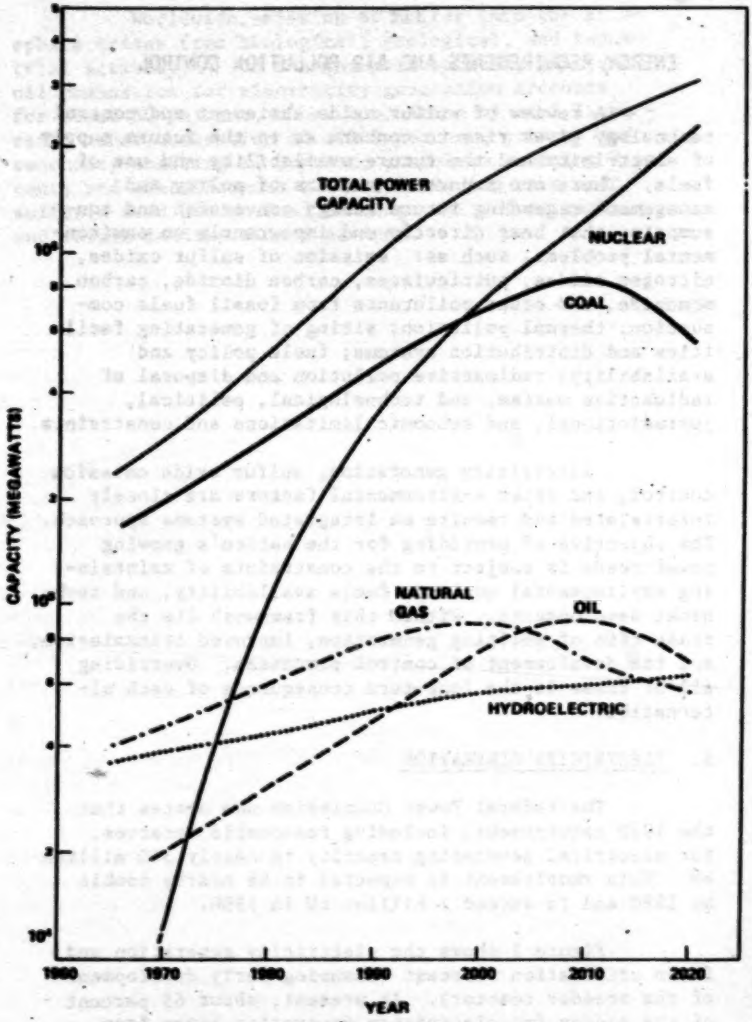


Figure 1. Projected power generating capacity and fuel sources of electric utilities in the United States (with breeder). NAPCA, February 1970.

remainder. It is predicted that the use of nuclear energy will increase rapidly and will exceed coal as an energy source around the year 2000. Because of the need to burn more coal to supply the needed power, sulfur emissions would be expected to increase more than fourfold by the year 2000, unless effective control processes are developed and applied.

Most of the new generating capacity installed between now and 1990 will be provided by some 250 large power plants of greater than 1,000 MW capacity.[2] The siting problem will generally be one of assuring that the relatively small number of large plants are adequately planned and located to meet the goals of providing low-cost, reliable power and minimizing the adverse effects on our environment. With an onsite investment of about $200 million to $400 million each, these new plants will be among the larger industrial establishments in the nation. Including support and auxiliary activities, they will represent approximately $80 billion of capital investment, which will be profoundly affected by the public interest.

B. SULFUR OXIDE EMISSIONS

The demand for electric power is increasing so rapidly that sulfur oxides emissions may increase even allowing for: (1) projected construction of nuclear power plants; (2) substitution of gas or low-sulfur fuel oil at locations where they are available; (3) use of coal of reduced sulfur content to the extent that can be expected; (4) introduction of improved combustion methods; and (5) application of improved stack-gas treatment and sulfur recovery processes.

Even with a national commitment to orderly but urgent plans for application of new technology, the best that can be hoped for through the year 2000 is a total sulfur oxides emission rate from all utilities somewhere near the present level. Near-term improvement in the quality of ambient air at ground level in urban areas may be brought about by resorting to dispersion of facilities, by use of tall stacks, or by load or fuel shifting under adverse meteorological

conditions. Sulfur oxides emission data and projections for the United States are shown in Table 1 and Figure 2.

Nuclear power plants emit no SO_2; essentially the same can be said for plants using natural gas. The technology for removal of sulfur from fuel oil appears to be reasonably well in hand. Further development of hydroelectric power will not be a major factor. The import of liquefied petroleum gases will most likely be increased to the limit of economic availability. Despite these factors, the use of coal will steadily increase and is projected to more than triple by the year 2000, before leveling off as large nuclear power stations replace those burning fossil fuels (Figure 1). About 75 percent of the sulfur oxides discharged into the atmosphere from man-made sources comes from the combustion of coal and oil. Gasoline contains almost no sulfur, so emissions from automobiles contribute little SO_2. But the combustion of coal, now averaging about 2.7 percent sulfur and forecast to increase to 3.5 percent by 2000, accounts for 65 percent of the total SO_2. The combustion of heavy fuel oil contributes about 12 percent.

TABLE 1

ESTIMATED POTENTIAL SULFUR DIOXIDE POLLUTION WITHOUT ABATEMENT[a]

UNITED STATES

	Annual Emission of Sulfur Dioxide (Millions of tons)				
	1967	1970	1980	1990	2000
Power plant operation (coal and oil)[b]	15.0	20.0	41.1	62.0	94.5
Other combustion of coal	5.1	4.8	4.0	3.1	1.6
Combustion of petroleum products (excluding power plant oil)	2.8	3.4	3.9	4.3	5.1
Smelting of metallic ores	3.8	4.0	5.3	7.1	9.6
Petroleum refinery operation	2.1	2.4	4.0	6.5	10.5
Miscellaneous sources[c]	2.0	2.0	2.6	3.4	4.5
Total	30.8	36.6	60.9	86.4	125.8

(a) February 1970 estimates by National Air Pollution Control Administration, excluding transportation.
(b) See Figure 2. With breeder reactor.
(c) Includes coke processing, sulfuric acid plants, coal refuse banks, refuse incineration, and pulp and paper manufacturing.

Stack gases from fossil-fueled power plants contain about 1,000 to 3,000 ppm of SO_2, depending on the amount of sulfur in the fuel (1 ppm = 2860 $\mu g/m^3$ at standard conditions). Detrimental effects on vegeta-

tion, materials, and human health are first noticed in areas having 0.03 to 0.04 ppm (annual mean) SO_2 concentration.[5,14,15,20] Thus, a 100,000-fold dilution or reduction in concentration is required, on the average, by the time the SO_2 reaches ground level. SO_2 concentrations are near and, in some cases, at times above these levels in several urban areas of the United States.[20]

A number of SO_2 monitoring studies have been made near power plants, and there are various theoretical and computer models for predicting dispersion from stacks and resulting ground-level concentrations for different meteorological and topographic situations. These are intended to show the relation between stack emissions and the permissible concentrations.[20] Such studies have served as the basis for decisions to require use of fuels having lower sulfur content or the use of SO_2 emission control equipment.

The high dilution from stack level to ground level of SO_2 concentration will be required even with development of control devices. The most efficient removal processes can be expected to reduce stack gas concentrations of SO_2 by about 99 percent, which will result in an effluent that could still be above acceptable ground level concentrations. In addition to SO_2 dilution, tall stacks will be needed to disperse carbon dioxide, nitrogen oxide, and water vapor and to provide mixing with air to raise the oxygen content.

In some cases, the 1 percent sulfur limit in fuels has been found to be inadequate, and several regions are considering further reducing the permissible sulfur content. The New York-New Jersey Metropolitan region has set standards limiting sulfur to a maximum of 1.5 percent in fuels that are burned in existing power plants. Other regions are considering similar limits. Bituminous coal containing more than 1.0 percent sulfur cannot now be sold in New Jersey, and the limit will drop to 0.2 percent in October 1971. But the supply of less than 1.0 percent sulfur coal is limited; it appears that it would be impossible to provide the needed fuels if this standard were enforced across the country.

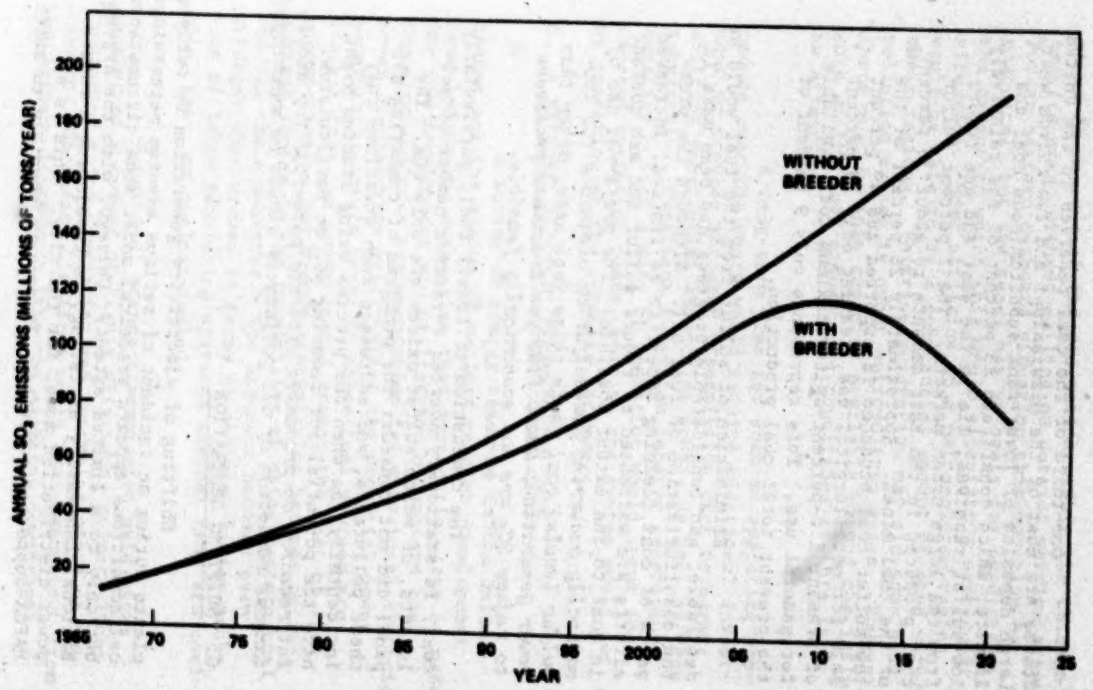


Figure 2. Comparison between projections for total power plant uncontrolled SO_2 emissions. NAPCA, February 1970.

One-third of the coal reserves in the United States are east of the Mississippi and two-thirds west. Large deposits of lower-rank subbituminous coal and lignite, which constitute 83 percent of the relatively low-sulfur reserves, lie in the West and are remote from the large urban markets. The 1 percent sulfur coal produced in the East amounts to about 36 percent of the coal mined. Approximately 26 percent of the low-sulfur coal produced is exported and 49 percent sold for metallurgical use, leaving only 25 percent of present 1.0-percent-sulfur-maximum coal available for general use. This represents only 9 percent of the present total coal production.

Elimination of sulfur from the fuel would be desirable, and considerable progress has been made in the desulfurization of fuel oil. Although the prospects of coal cleaning appear to be limited, increased efforts are warranted to reduce sulfur and ash content in coal to the extent possible. *The preferred use of naturally occurring low-sulfur or cleanable (to low-sulfur levels) coal is in those fuel uses, other than power generation, where flue gas treatment processes to reduce SO_2 are not economically feasible.*

The combustion of fossil fuel, particularly coal, in stationary sources creates a number of pollutants, of which sulfur oxides are only one. The panel did not consider the problems of combating all these pollutants, and addressed such questions only incidentally, as when the process being studied might have the potential for removing NO_x or particulates. But, *research on processes with the potential for simultaneous reduction of all pollutants should be encouraged.*

C. SHIFTING GENERATION

Shifting of electricity generation to outlying plants during an incident of serious adverse meteorological conditions appears practical under some circumstances, but only to a limited extent. Chicago, with the Argonne National Laboratory assisting, is developing a future power distribution model for the city. This is a NAPCA-supported activity. It appears possible to shift

about 25 percent of the generation within the Chicago service area, without calling on outside service areas. For an eastern seaboard situation this may also be practical, but the panel has no basis for predicting the extent to which this would alleviate a particular situation. Most utilities in a metropolitan region would be able to do a substantial amount of good within their regions. Shifting generation may aid some peak pollution crises in other metropolitan areas. However, there must be idle capacity available beyond the influence of the poor atmospheric conditions if this is to be effective.

A long-term plan for such an operating procedure over the years would require additional investment to provide stronger transmission ties to permit shifting substantial amounts of power, as well as very substantial investment in system reserve generating capacity. Such a mode of operation would incur increased operating costs, because the system would not be operating at its economic optimum.

D. A NATIONAL ELECTRIC TRANSMISSION GRID

A survey of energy reserves in the United States and the status of nuclear reactor development have led to the suggestion that systematic plans be made for the development and utilization of western coal deposits and to a recommendation for a national electric power transmission grid.[12] Since the potential power generation centers based on these fuel sources are distant from the power demand areas, the cost of fuel transportation and energy transmission becomes an important factor in the feasibility of using western coal and oil shale reserves. The argument becomes even stronger when viewed in terms of the many siting problems of large generating stations whether they are coal-, oil-, gas-, or nuclear-fueled.

A national energy transmission grid might consist of a number of highly efficient, primary lines connecting major generating and consuming areas of the country. Secondary tie lines would then branch out from the primary lines much like the existing power-pool

transmission lines. Preliminary economic analysis[12] indicates feasibility and additional potential benefits in communication and by-products manufacture. Planning, coordination, and implementation of such a venture must be accomplished at the national level. It is appropriate to note here that transmission lines pose significant environmental problems of their own, which may be solved eventually by placing them underground.

The design, construction, and utilization of a very low resistance (super-conductive) national electric energy transmission system would have many advantages, including: (1) implementation of an effective national fuels and energy policy; (2) management of environmental factors related to energy generation, transmission, and utilization; and, (3) improvement of security and reliability of energy sources, generation, transmission, and utilization.

Long-term, broad-scale planning of this magnitude is important in meeting the problems of environmental quality, energy requirements, economic development, and national security.

E. LONG-TERM ENVIRONMENTAL CONSIDERATIONS

The buildup of CO_2 in the atmosphere has not been an important consideration in most air quality improvement planning, and the *ad hoc* panel was not charged with reporting on the long-term global temperature and ecological effects of increasing concentrations of long-lived air pollutants. But is appropriate to remark that CO_2 and submicron-size particulates are the only contaminants resulting from combustion and reduction processes that may be of importance to global ecology. A portion of the submicron particles are sulfate aerosols formed by the reaction of SO_2 in the atmosphere.

Combustion of fossil fuels, a major source of SO_2, is also the source of perhaps 50 percent of the atmospheric buildup of CO_2. Because of this relationship to energy requirements and fuels availability, the panel believes that a discussion of SO_2 pollution must also include recognition of the possible long-term

effects of increasing levels of CO_2.[10] By the year 2000, it is estimated that there will be a 25 percent increase in CO_2 in the atmosphere, compared to the amount present during the nineteenth century. It is further estimated that this increase may affect the earth's radiation balance causing a corresponding increase in the average temperature near the earth's surface.

However, it has been pointed out[6] that there is also a possible worldwide change in the amount of atmospheric fine particles. In addition to particles rising from the earth's surface, significant quantities may be deposited directly in the stratosphere by supersonic transports when they come into extensive use. An increase in fine particulate materials, some of which are SO_2 decay products, may have the effect of increasing the reflectivity of the earth's atmosphere and reducing the amount of radiation received from the sun.[11] This effect would be the opposite of that caused by an increase in CO_2. It is suggested that the large-scale cooling trend observed in the Northern Hemisphere since about 1955 is due to the disturbance of the radiation balance by fine particles and that this effect has already reversed any warming trend due to CO_2.

Whichever may be the case, *it is clear that considerable uncertainty exists as to the effect of long-lived pollutants on the environment.*

Nuclear power presents several potential air pollution problems.[3] Solid waste from radioactive materials in spent fuel rods appears to be a relatively small air pollution problem but is a significant solid waste disposal problem. There are important questions regarding the effects of small amounts of tritium (half-life of 12.26 years) present in the cooling water. The tritium may enter biological systems and produce radiation effects and damage during its decay. Finally, krypton-85 (half-life of 10.4 years) released at the reactor and the fuel reprocessing plant might accumulate in the atmosphere over an extended period, much like carbon dioxide. At some time it may become necessary to collect the tritium and krypton for storage rather than release to the environment.

IV

ENERGY RESEARCH

The National Air Pollution Control Administration has been designated the Federal "lead agency" to provide objectivity, coordination, emphasis, and support to the national efforts to restore and control the quality of our air environment, including:

1. Accumulation, interpretation, and dissemination of all pertinent information

2. Coordination of short-, medium-, and long-range planning of research, development, and demonstration activities of Federal groups such as the Atomic Energy Commission, Tennessee Valley Authority, Federal Power Commission, Bureau of Mines, Office of Coal Research; and state, regional, and local agencies as they relate to air quality factors resulting from extraction, processing, transportation, and utilization of energy resources

3. Planning, initiation, coordination, and funding of research, development, and demonstration of broadly acceptable systems, subsystems, and components as required to reduce air pollution to acceptable levels

Accomplishment of these objectives will require a high level of planning and coordination between the several governmental, research, legislative, industrial, and civic groups involved to: (1) evaluate feasible and acceptable alternative courses of action, (2) determine present and future consequences of specific action or inaction, (3) evaluate the impact of changes on one or another element of the system, (4) determine priorities and funding levels, and (5) select the most broadly acceptable courses of action.

The complexities of the national energy-generation and energy-utilization system will increase with

time. However, careful planning and coordination of national and regional efforts, not only for SO_2 control, but also for control of other air, water, thermal, visual, and solid waste pollutants, will minimize future problems related to environmental degradation associated with plant siting, transmission systems, fuels utilization, engineering feasibility, economics, and public acceptability. Planning and coordination activities of this magnitude present a major national challenge to keep pace with the 6 percent projected annual increase in electricity requirements and still maintain an acceptable environment.

Each year the Federal Government supports research and development to improve methods for producing, converting, and transmitting the primary energy sources--petroleum, gas, coal, oil shale, uranium, and water power. Table 2[1] provides an accounting, by primary energy source, of Federal research and development funds currently being devoted to the task of assuring an abundant supply of energy at reasonable costs to meet the nation's future needs, with minimum impairment of the quality of the environment.

In addition, industry spends hundreds of millions of dollars annually for research and development, with the petroleum industry accounting for a substantial portion of the private expenditures in the energy field. Substantial amounts are spent by utilities and manufacturers on electric power generation and transmission equipment and nuclear fission as part of their facilities development. However, industrial research and development expenditures on coal, oil shale, hydroelectric power, and controlled fusion are but a fraction of the Federal program in this area.

The important bases for viewing research and development expenditures in Table 2 are the energy generation patterns in 1980 and 1990 (Figure 1), and these, in turn, are influenced by the success of present research and development. The relative stage of development of each form of energy conversion must also be considered, since the costs of developing a new technology, such as nuclear fission or fusion, are

TABLE 2

FEDERAL RESEARCH AND DEVELOPMENT EXPENDITURES BY PRIMARY ENERGY SOURCE
(Excludes projects less than $500,000)

		In Millions by Fiscal Year		
		1968	1969	1970 Est.
Uranium and Thorium				
AEC	Fast Breeder Reactors	82	102	122
	Other Breeders and Converters	82	62	50
	General Reactor Technology and Safety	91	97	104
	Total	255	261	276
Coal				
Interior	Bureau of Mines	9	9	11
	Office of Coal Research	12	14	13
	Total	21	23	24
Petroleum and Natural Gas				
Interior	Bureau of Mines	3	3	3
Oil Shale				
Interior	Bureau of Mines	1	2	2
Thermonuclear Fusion				
AEC		27	29	34
	Total	31	34	39
General R&D				
AEC	Plowshare Underground Engineering	3	1	1
HEW	Air Pollution	8	12	15
Interior	Explosives Research	1	1	1
NSF	Energetics Engineering	3	3	3
TVA		1	1	1
	Total	16	18	21
	Over-all Total	323	336	360

greater than those for improving existing systems involving other forms of energy.

The energy conversion efficiency of fossil-fueled power plants appears to have stabilized after gradually increasing over the years. New fossil-fueled steam power plants currently have efficiencies of about 40 percent in converting the fuel combustion energy into electrical energy. Present commercial nuclear power plants range from about 30 to 35 percent in conversion efficiency, and breeder reactors are expected to reach about 40 percent efficiency. Combined cycle systems, are, in principle, more efficient energy conversion facilities. For magnetohydrodynamic generation using fossil fuels, with a steam plant to utilize the energy contained in the hot gases leaving the magnetohydrodynamic unit, the combined efficiency is projected to be on the order of 50 to 60 percent.[12] The high temperature required will cause increased nitrogen oxides formation. Improved efficiency reduces the amount of fuel required and the amount of heat rejected to the environment to meet a given demand. For sulfur-bearing fuels, the SO_2 emission would be correspondingly reduced.

V

FACTORS OF FUELS UTILIZATION

Fuel use patterns are dependent upon supply (availability) and on certain technical developments in fuel production, energy conversion, and energy transmission. Projections indicate maximum production of natural gas in the United States within 10 years and of petroleum products within 30 years. [8]

The Atomic Energy Commission estimates that in the year 2000 nuclear energy will supply about 44 percent of the national electricity generating capacity, coal about 41 percent, and gas, oil, and hydroelectric power about 15 percent. Present fuel sources for electricity generation are: nuclear, 1 percent; coal, 65 percent; and gas, oil, and hydroelectric, 34 percent. Serious delays in construction schedules of several nuclear power plants have occurred during the past year, and the cost estimates per installed kW have risen from about $130 in 1967 to about $200 in 1970.[13] Cost for fossil-fueled plants were about $110 to $130 per kW in 1967, and are $120 to $160 per kW in 1970. These costs include particulate-control devices, but do not include equipment for SO_2 or NO_x control. *Recently, a number of orders for fossil-fueled plants, with shorter lead time and lower capital costs, have been placed by utilities to meet power requirements that nuclear plants might have met under earlier construction schedules.*

These factors indicate a greatly expanded use of coal as an energy source during the next 30 to 40 years (Figure 1). The United States has an assured reserve of coal and oil shale to meet its energy needs for hundreds of years to come. Some changes in the schedule are dependent upon the development of:

1. Early resolutions to siting, environment, and economic problems related to present and future power plant development

2. Processes for more effective coal desulfurization

3. Processes for conversion of coal to "clean" gaseous or liquid fuels

4. The fast breeder nuclear reactor, which will reduce nuclear fission fuels costs and extend nuclear fuel resources

5. Various combined cycles such as magneto-hydrodynamic generators, which are potentially more efficient than steam turbine generators

6. Industrially efficient processes for the extraction of oil and gas products from oil shale

7. The controlled nuclear fusion reactor, which would make large amounts of energy available

Difficulties with equipment delivery and plant siting have already seriously delayed the construction of generating capacity in parts of the United States. The Federal Power Commission states that 39 of 181 major systems have reserves of less than 10 percent peak load. There is a real possibility of power shortages and "brown-outs" in some power pool areas during peak-load periods of the next several years.

At many inland sites, river water and ground water are no longer available in sufficient quantity to be used for once-through cooling; hence, evaporative cooling towers have come into fairly common use. At several locations, in the eastern as well as far western parts of the country, even the demand for make-up water for cooling towers (about 2 to 3 percent of the once-through rate) exceeds the amounts available from rivers and existing wells without endangering the river flow or the water table. In England, this situation has resulted in installation of closed-cycle cooling systems that exchange heat to the air through finned

heat exchangers.[2] Costs, of course, increase substantially with the transition from once-through to closed-cycle cooling systems.

There is also some thought that man's future needs may be better served if substantial reserves of coal, petroleum, natural gas, and oil shale are set aside for the rapidly growing requirement for chemical industry feed stocks. Such a reserve will, of course, depend largely on the beneficial application of developing nuclear technology. Thus, the critical need for development and application of technology to control pollution resulting from fossil fuel (particularly coal) combustion may well occur between now and 1985 or 1990.

In view of these consideration, it is evident that SO_2 problems that are generally restricted to coal use (and in a smaller way to ore smelting and petroleum use) will grow until SO_2 control processes or other energy sources are developed. Thus, *the SO_2 abatement problem fits into the larger problems of fuel policy and management.*

VI

TIME PHASES OF TECHNICAL DEVELOPMENTS

Successful development and application of several control processes and the breeder reactor are crucial in the abatement of sulfur oxide emission to the atmosphere. As shown in Figure 2, assuming the breeder reactor comes into wide application after the year 2000, coal consumption and sulfur emission would peak and decrease rapidly even without emission control.

Research on fast breeder nuclear reactors is proceeding rapidly in several countries. The British 60 MW pilot breeder reactor at Dounreay, Scotland, went critical in 1959 and has operated continuously except for a 1-year shutdown during 1968-69 to repair a leak. The United States 150 MW "Fermi" breeder reactor in Monroe, Michigan, first went critical in 1963. It was shut down in October 1966 due to a subassembly meltdown and is scheduled to start up again in 1970. The Atomic Energy Commission is now selecting a site for a 500 MW demonstration breeder power reactor to start in 1976. Projections call for the first commercial breeder reactors of the 1,000 MW size to start up about 1985 in the United States.

Fuel substitution has already begun to be practiced but is restricted by the limited availability of low-sulfur oil, coal, and natural gas. More intensive cleaning of coal to remove pyrite may make a contribution to sulfur-emission control comparable to fuel substitution as it comes into wider use in the next few years. Although limestone processes for the removal of SO_2 from stack gases--which do not produce a marketable product--should be commercially proven in the next 1 to 3 years, broad application of these processes will require several more years. Several product-producing processes for SO_2 removal should be commercially available in the mid-1970's or early 1980's and should find wide application in the new coal-fired plants. With adequate funding and experimental success, new combustion technology should be available in 5 to 8 years.

As with the breeder reactor, there is no assurance that the control processes will be developed as predicted. *The time estimates are realistic only if there is a positive commitment on an urgent basis by government agencies, utilities, fuel suppliers, and equipment manufacturers to support the orderly development and timely application of these processes.*

The sequence of technical developments must be coordinated with the plans for compliance with air pollution control regulations and the availability and use patterns of various fuels. As the national air quality control regions implement their criteria and emission control schemes to improve the quality of the air, there will be a growing need for the different kinds of technology and a shifting in types of fuel used.

For example, in the Washington, D.C., area, plans are being developed for the National Capital Interstate Air Quality Control Region.[7] In addition to a reduction in suspended particulate matter, it is proposed that all fuels burned in the region must contain 1 percent or less sulfur. It is also proposed that, after July 1, 1971, distillate fuel oils (ASTM No. 1 and No. 2) should contain 0.3 percent or less sulfur. Fuels containing in excess of 1 percent sulfur could be burned, provided control equipment to desulfurize stack gases had been installed or other methods were used that would produce results equivalent to the burning of fuel containing 1 percent or less sulfur.

All fuel-burning installations constructed and all fuel-burning installations altered or modified for use of a different fuel having a maximum heat input of less than 250 million Btu's per hour would be required to burn gaseous fuels, provided that distillate fuel oils could be used for not more than 30 days in any calendar year. However, liquid and solid fuels could be burned, provided it were demonstrated that sulfur oxides, particulate matter, and nitrogen oxides emissions would be equal to or less than would result from burning gaseous fuels to accomplish the same heating objective

At this time, the complete substitution of gas, or low-sulfur oil, for coal in Washington, D.C., appears to be the only possible way, short of establishing an all-electric city, to achieve the long-term goals that are being considered.[7] Other proposed actions include control of open burning and tighter limits on emissions of particulates and sulfur oxides from incinerators and industrial operations. These suggestions, of course, are not to be taken as courses of action recommended by the panel.

To meet such goals in other cities, it would be necessary for industrial plants to install more efficient particulate control on all stacks, and SO_2 scrubbers on many processes. Heating systems would have to convert to gas, low-sulfur oil, or electricity, depending upon fuel availability. Existing power plants would need to convert to oil or gas or add stack removal of SO_2, and new plants would use nuclear energy, gas, or perhaps something like fluidized bed combustion of coal.

Such shifting would require the expansion of gas and oil supply systems. Since natural gas reserves are limited, both coal gasification and importing of liquefied natural gas would probably be necessary to meet the increased demand.

There is a possibility that a number of the newly created air quality control regions will adopt plans such as those described above in the next few years. *Care must be exercised at the local, regional, and national levels to assure that realistic criteria and plans are adopted which can be implemented in concert with the development of technology and the systematic use of our energy resources.*

There is a real danger that the public may be led to expect environmental improvements at a rate that cannot be realized. This is not to say that high goals should not be established, but rather that realistic and coordinated implementation plans must be adopted.

VII

SUPPORT OF TECHNOLOGICAL PROGRESS

The objective of support of technological progress in SO_2 emissions control is to advance the state of the art with all deliberate urgency consistent with prudent engineering and economic judgment and national needs.

The Federal effort to achieve the necessary sulfur oxide control should be in partnership with the electric-power industry, equipment manufacturers, and the fuels industry. Eventually, sulfur oxide control may create a market that will offer some industrial incentives. Meanwhile, implementation of SO_2 control plans is a major national problem that will require large expenditures by the utilities and large costs to consumers, unless technology is developed that will minimize these costs.

In seeking suggestions for enlisting the private sector in support and augmentation of the Federal effort, the panel found that in recent years many companies have spent up to several million dollars developing their processes to the pilot scale and beyond (Chapter VIII). Other companies, some with interesting technological approaches, do not have adequate funds even for bench-scale work. Within industry, the competition for research and development money is such that the expenditure of $5 million to $10 million of a company's funds on commercial demonstration of one process may be a poor research and development risk when compared with alternative projects of corporate interest.

A. COAL INDUSTRY

The coal industry is not process-research oriented and its air-pollution research and development has been fragmented. To date, the industry's effort has been limited to a few modest projects that have been conducted by several major companies and with sponsorship by Bituminous Coal Research, Incorporated

(BCR). Work within individual companies has been largely concentrated on methods for removing ash and sulfur from coal. The work at BCR, which is supported broadly by the industry, has been devoted to stack gas cleaning processes and coal cleaning, with the predominant emphasis on the latter.

B. EQUIPMENT MANUFACTURERS

The panel learned that the equipment suppliers see no immediate profit potential in the research and development of new SO_2 control equipment under present accounting and taxing policies. What the equipment manufacturers do develop can seldom be protected from use by competition, because very little of such equipment is proprietary or subject to patents that cannot be circumvented. A manufacturer may invest his money and develop a sulfur control process using equipment that he manufactures, only to find that similar equipment is available from many manufacturers, and the utility applying the process may seek competitive bids. Consequently, patents on equipment of this type are regarded as relatively worthless. Patents on a process may be valuable, but the overall situation is such that little acceleration of the research effort can be expected to follow automatically in the private sector, even when sulfur control regulations become more stringent.

Despite these considerations, equipment manufacturers are developing new equipment for air pollution control applications and have participated in a number of joint pilot, demonstration, and feasibility studies.

C. UTILITY COMPANIES

As regulated monopolies, electrical utility companies are subject to the control of various governmental bodies, Federal, state, and local. Consequently, funds spent by utilities for development and application of pollution control processes may not be readily included in their capital structure, which is the basis for establishing consumer rates.

The utility companies, however, are supporting sulfur oxide emission control studies individually and jointly. Over 25 utilities are participating in research, development, and demonstration work on several promising processes (Chapter VIII). The panel agreed on the following points with respect to support by the utility companies of research, development, and demonstration (R,D,&D).

1. Funds spent for development and application of pollution control processes may not have the potential of self-liquidation under present rate-making policies.

2. Many utilities located in urban areas are making determined efforts to secure reliable sources of low-sulfur fuels and installing equipment for multiple fuels capability.

3. The costs of developing and applying control processes will be high; the utilities are neither equipped nor staffed to do the kind of process development and demonstration that is needed. Because of the expense and time involved, it is probably not realistic to expect individual companies to carry out impressive internal R,D,&D programs.

4. The technological risk of applying processes that are inadequately demonstrated is too great to force acceptance and installation of these processes. The most likely effect of legislative pressure will be to force the use of the limited supplies of available low-sulfur fuels. Therefore, until reliable processes are adequately demonstrated, the effectiveness of legislative pressures will be limited.

5. It might be possible for utilities to do more cooperative R,D,&D. Regulatory and taxing agencies might consider adjusting their policies to encourage such activity.

D. FEDERAL GOVERNMENT

Even if additional cooperative funding by the coal industry, equipment manufacturers, utility companies, and process developers can be arranged, government support will be needed for many years to encourage development, demonstration, and application of sulfur oxide control technology. *Unless the necessary technology becomes available, the country may have to choose between clean air and electricity.*

The crux of the problem is its urgency with respect to lead time and degree of applicability of any single process. The schedule for abatement of the emission of sulfur oxides reduces the lead time to a very short period. In order to demonstrate a variety of processes which might be applicable to specific conditions, *the reduction of lead time and the diversity of processes required demand an intensive and concerted effort substantially greater than normal industrial process development.*

Although no control process has yet reached the stage of demonstrated full-scale application in a power plant, several methods that may be suited to particular sets of conditions are under development and should be brought to a stage of industrial efficiency with all deliberate speed. *This can be accomplished most expeditiously by adequate funding of NAPCA in its role as Federal "lead agency" to assure significant progress in an acceptable period of time.*

There are three stages of process development at which Federal support and encouragement are justified:

The first stage is in unrestricted broad-ranging investigations. Such pioneering investigations should normally be restricted to bench-scale work and are worth supporting on a continuing basis.

The second stage involves pilot-plant trials of new processes that appear to be promising.

The third stage comes after pilot-plant trials have been concluded, and when the most promising processes are considered ready for demonstration on a scale that would provide engineering and economic data that could be projected with confidence to large operating units. Such large-scale demonstrations are necessary and will be quite expensive, running into several million dollars for each process selected. This is a critical point in the application of new technology. National needs will be most effectively accomplished by a full partnership (financial and technical) between government agencies, utilities, equipment manufacturers, process developers, and fuel suppliers.

In addition to support of research and development, governmental assistance may be provided through changes in tax and patent policies and provisions for Federal funding of "risk capital." The proposed Tax Reform Act allows accelerated amortization of pollution control equipment. The prospect of profitable patents is an incentive for further research by industry. Several government agencies are reviewing patent policy at this time to determine what changes might be made to encourage research, development, and application of processes designed for pollution control. The Patent Office has recently announced its intention to accelerate the handling of applications dealing with pollution control inventions.

In addition, the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works has heard testimony in recent hearings on S.2005--The Resource Recovery Act of 1969, S.3469--The Wastes Reclamation and Recycling Act of 1970, and the Amendment to S.2005, cited as the National Materials Policy Act of 1969. Federal provision for "risk capital" was one of a variety of subjects discussed. Other approaches of financing of research, development, demonstration, and application of processes and facilities designed to control various types of pollution are being considered at the Federal executive and legislative level.

VIII

PRESENT STATUS OF RESEARCH AND TECHNOLOGY

A. AVAILABILITY OF TECHNOLOGY

Although the panel is optimistic that acceptable sulfur oxides control technology will be developed, it concludes that this technology is not yet commercially proven. Moreover, a rapid pace must be maintained in pursuit of the technical objectives, if only to prevent conditions from getting worse. Even when the expected technology becomes available, it will be too late to prevent a significant rise in total sulfur emissions during the next several years.

Five general approaches might be made to sulfur oxides control problems:

1. Undertake a crash program to build nuclear power plants
2. Remove sulfur from fuels before they are burned
3. Remove sulfur from fuels during the combustion process
4. Remove the SO_2 from the combustion gases before emission to the atmosphere
5. Employ very high stacks and remote siting so that the gases are dispersed and diluted to an acceptable level

The first approach is impractical because of the prohibitive expense and inability to meet even present construction commitments. Some combination of the second, third, and fourth approaches offers the best promise in the United States. However, the processes to accomplish sulfur removal from coals before and during combustion, and from combustion gases, are not adequately developed, and are not immediately acceptable for wide application. Tall stacks and

remote siting, the fifth approach, are being promoted in England and to some extent in the United States.

Sulfur is readily removed from distillate oils, and the technology is well established. Residual fuel oils are more difficult to treat, because they contain metals that deposit on the solid catalysts employed. The petroleum industry has invested heavily in the development of ways to desulfurize fuel oil, and there is no doubt that some of these methods will work. The plants required are costly, and the added refining step of reducing the residual fuel oil from 2.6 to less than 1.0 percent sulfur will probably increase the price to the power station by 50 to 80 cents per barrel. This represents an increase in fuel cost of 20 to 35 percent. Fifty cents per barrel of oil is equivalent to an increase of about 0.7 mills per kWh in power costs.

Sulfur in coal is present principally as the mineral pyrite and in complex organic compounds; in these two forms, it exists in widely varying ratios. With some coals, pyrite can be largely removed by grinding and washing, but, on the average, only about half can be removed, using existing coal cleaning technology. It appears that organic sulfur may be removed only by hydrogenation, liquefication and gasification processes.

Preliminary results of NAPCA's survey of naturally occurring low-sulfur coals and washability characterization tests of coals available for uses other than for metallurgical coke production suggest that of the steam-coal production: 8 percent has 1 percent or less sulfur as mined and could be cleaned further; 11 percent is coal with over 1 percent sulfur that is easily cleaned; and 6 percent is coal with over 1 percent sulfur that is cleanable at a higher cost. Thus, perhaps, 25 percent of the steam-coal production is capable of being cleaned to produce coal with a maximum of 1 percent sulfur.

NAPCA further estimates that refinement and broader application of coal cleaning technology might

result in an average reduction in sulfur content of the remaining 75 percent of steam coals by as much as 40 percent.

Coal washing costs may range from 25 to 75 cents per ton of cleaned product.

Where fuel desulfurization is practical, it offers the most obvious and direct method to reduce SO_2 pollution from combustion. Several processes are under development for the production of liquid and gaseous fuels from coal, and liquid fuels from oil shale, and will perhaps be demonstrated to be industrially feasible within a decade. Meanwhile, most of the needed coal cannot be desulfurized to a maximum of 1 percent sulfur by use of presently available technology.

At least two processes offer hope for removal of sulfur during combustion: (1) "fluidized bed" combustion, and (2) "molten iron bath" combustion. Optimistically, the perfection of these techniques as commerical processes is 3 to 8 years away, and there is some question that either can be retrofitted into existing plants. If successful processes can be developed, their major application will be in plants that are engineered and constructed after the processes are determined to be applicable on a commercial scale.

Many ways of removing SO_2 from stack gases are being actively investigated--all involving some means of contacting the gas with a substance that removes SO_2. At least 25 such processes are under development in this country by industry and by NAPCA (Appendix C), and others are under development in Japan and Europe (Appendix D). Most are bench-scale laboratory projects, but several have reached the pilot-plant stage (10- to 25-MW equivalent gas streams). Only the limestone-wet scrubbing process has been installed in sizable operating power plants. Several of these processes will probably be technological successes, but the efficiencies are not yet well established for even the most advanced. Projected costs range up to 1 mill per kWh and, in some cases, higher, depending upon method of financing.

Although SO_2 emissions are not decreased by remote siting and tall stacks, these measures help reduce ground-level SO_2 concentrations in urban areas. As previously discussed, even with application of sulfur removal processes, tall stacks will continue to be necessary for large power stations to disperse and dilute all remaining emissions, including carbon dioxide, nitrogen oxide, and water vapor.

It should also be noted that the possiblity of establishing one national air quality control region and broader international and even global cooperation in environmental quality management may require national emission standards.

The future of sulfur control is not hard to predict in general terms. The country is committed to reducing air pollution, and increasingly stringent standards regarding sulfur concentrations in the ambient air are being established. Users of high-sulfur fuels will attempt to switch to natural gas, desulfurized fuel oils, or low-sulfur coals, all of which are in limited supply. These will command a premium price over present fuels. Where practical, the coal industry will find more intensive treatment of steam coals profitable. Where possible, new mines in known low-sulfur coal deposits will also be opened. It normally takes about 3 years to bring a new mine into full production.

Because these developments will not meet the total requirements of low-sulfur fuels necessary to control the continuing increase in sulfur emissions, many presently operating utilities will have no near-term alternative except to install facilities to remove sulfur from stack gases. Probably, the simpler methods, which produce "throw-away" by-products, will be the first to be adopted by many existing plants. The more complicated processes, which produce sulfuric acid, SO_2, or elemental sulfur, may be demonstrated in 3 to 10 years.

By perhaps 1980 or 1985, sulfur emissions stemming from smelters and the combustion of fossil fuels will be under fairly good control, although total sulfur emissions will have risen substantially over those at the present time. By 1975 to 1985, there may be ways to burn coal, such as by fluidized-bed combustion in the presence of lime, to fix the sulfur so it is not carried by the stack gases.

B. THE NEED FOR COMMERCIAL DEMONSTRATION

It is important to note that industrially proven technology for the control of sulfur oxides resulting from fossil fuel combustion does not now exist. Only one of the several processes under development has been installed in 100-MW or larger boilers, and it has operated only intermittently.

Data on processing variables accumulated during each stage of process development are evaluated to determine the feasibility of scale-up to the next stage. If feasibility at the bench and pilot scale has been established, prototype industrial scale operation for a minimum of 1 year is necessary to secure sufficient knowledge of the process to establish control parameters, operating reliability and efficiency, maintenance requirements, adequacy of materials and engineering, and ability of the process to meet air quality objectives.

Consequently, *there is an urgent need for commercial demonstration of the more promising processes, to make reliable engineering and economic data available to engineers who are designing full-scale facilities to meet specific local and regional conditions.* The panel's definition of proven industrial-scale acceptability is satisfactory operation on a 100-MW or larger unit for more than 1 year. Also, technical and economic data developed must be adequate for confident projection to full commercial scale. Pilot scale refers to investigation using flue gas in the capacity range of 10 to 25 MW. Smaller sizes and studies using synthetic gas mixtures are considered to be bench scale.

Estimates of industrial-scale feasibili and adequacy of a process based on paper studies or bench-scale projections are, by their very nature, too speculative to be reliable in making large-scale economic or engineering choices between alternative processes. Such estimates do, however, provide a basis for decisions related to the next level of scale-up. The estimates of installed cost per kilowatt range from $4 to $40 for the processes under development. If the figure were $10, the cost to install control equipment in existing coal-fired power plants would be about $2.2 billion. Total operating costs may be of the order of 0.5 mill per kWh. These are not reliable estimates of the ultimate cost to the consumer of electricity, but they do serve to indicate the magnitude of the problem of SO_2 control.

Even though the technical feasibility of a process were indicated on a pilot-plant scale, industry would be understandably hesitant to fund a large installation prior to full-scale evaluation. For a utility, the risks of failure to meet air quality objectives--as well as operational objectives--are great. For the nation, the possibility of delaying effective SO_2 control by installing equipment that does not do an adequate job is also great. When national objectives call for accelerated construction of high risk, large investment, and the use of unproven processes, it is proper for the government to share in the risks by participation in those portions of the project that are first-of-a-kind engineering demonstration units.

The development of several of the processes for removal of sulfur from stack gases is well advanced. Pilot plants of up to 25 MW have demonstrated to varying degrees the technical feasibility of at least three of these developments. The diversity of the schemes being developed is gratifying, because quite different technical solutions will be required to meet the wide variety of situations in which sulfur control is necessary.

The panel believes that it would be appropriate and very much in the national interest for NAPCA,

under Section 104(a)(4) of the Clear Air Act of 1967, to provide support of several million dollars, in partnership with industry, to expedite the first commercial demonstration installation of each of several promising processes for SO_2 control.

C. BACK-FITTING EXISTING PLANTS

The dry- and wet-limestone processes could probably be used by many existing plants. These are by no means the final solution, and other processes involving by-product recovery should be developed.

Many stations have limited areas in which they can dispose of the ash, and would have to haul it away. For some older plants in crowded areas, very little space is available; forcing them to utilize large quantities of limestone could result in their conversion from coal to a low-sulfur oil. Sometimes, simply upgrading the electrostatic precipitator for the dry-limestone process would cost more than to convert from coal to an oil-fired unit utilizing low-sulfur oil. In addition, for a given precipitator efficiency, a threefold increase in fly ash will nearly triple the particulate emission.

The existing smaller power plants have the other alternatives of obtaining low-sulfur coal, oil, or gas, if supplies of these fuels are available. These alternatives are also available to large plants, but the panel believes that, *from a national point of view, the most logical use for the low-sulfur coal is in commercial and industrial plants, small power plants, space heating, and for production of metallurgical coke.*

The forward-looking utilities are providing space in new plants, in anticipation of the necessity of installing corrective measures for flue gas treatment. They are allocating space or buying enough land to enable them to fit in the technology more easily when it is available. One restriction of this policy is that it provides only for the type of process that would take gases at the usual discharge temperature

of 300°F. It would not easily permit installation of a process that requires use of the high-temperature part of the boiler. The plan is to minimize the back-fitting cost on a 300°F process. Those processes that are designed to operate at 600°F to 900°F will require about 3 years' lead time, and the back-fitting will cost much more than if control technology were available and could be incorporated in the initial design.

D. CENTRAL RECOVERY FACILITY

Utilities may find product-producing processes more attractive if a central chemical processing plant can be employed to collect and regenerate the absorbents or adsorbents from several installations. This appears to be an interesting possibility in connection with several of the schemes that produce salable chemicals.

The suggestion has been made that the chemical industry be brought into partnership with the electric power industry. It is feasible to have a separate chemical operation that would serve a number of utilities. The attractiveness of this scheme depends on the distance and the transportation involved and the method of financing. It would probably have to be a facility financed by the electric power industry and operated by the chemical industry under a contractual arrangement. It is possible that the utility could pay enough for the return of the absorbing medium to make it attractive for the chemical company.

A central facility is attractive for several reasons:

1. The utilities evidently prefer not to get into the chemical business.

2. The recovery operation in many of these processes requires facilities and space comparable to the boiler plant.

3. The economy of scale for a central unit would be better than that of a single

utility plant, in which the installation of a chemical plant of uneconomic size would not be feasible.

4. The central processing facility could operate at a higher and more uniform rate than one located at, and dependent on, a single power station operating on a varying load factor.

It has been suggested that the ultimate control facility might be a combination major power plant, petrochemical, and sulfur-chemical complex. Coal chemicals are presently produced in quantity during coke manufacture by the steel industry. These organic chemicals are used as feed stocks for petrochemical processes in competition with petroleum refinery products. A similar activity may evolve from the utility companies as they strive to reduce pollutant emissions from coal and other fossil fuels used in power generation.

E. RESEARCH PLANNING

From a national point of view, the research strategy should be to have several processes in commercial operation at the earliest possible date. Primary emphasis should be placed on achieving industrial feasibility for the processes that can be readily incorporated into existing power plants, even though some of them may produce only nonsalable or throw-away by-products. Successful development of these processes would do most to alleviate air pollution in the shortest possible time.

Besides development of throw-away processes, development of product-producing processes must be continued. For the new installation, improved processes, including steps to recover some value from the sulfur, will be necessary to keep costs for future control within reasonable limits. Installation of many of these processes in existing plants would require major changes. Consequently, they are unlikely to be found broadly applicable to plants now in existence. Compliance with the standards that may be promulgated

within the next year or two will be extremely difficult at best, and may be impossible, even with the development and installation of the throw-away processes that appear to be nearly ready for installation.

The limestone injection processes expected to be available in 1 to 3 years will probably not be adequate for the long-term requirements, and NAPCA should continue to support the development of sulfur-recovery processes.

Coal cleaning should be studied further, at least on a small scale, until its sulfur reduction potential is clearly defined. Imaginative new methods for removal of both pyritic and organic sulfur from coal should be encouraged.

The panel places special emphasis on the following:

1. Complete development of the limestone process should be given high priority because it seems applicable to existing boilers. At the same time, NAPCA should support long-range research on processes that industry will be slow to develop. Fluidized bed combustion, which has potentially attractive antipollution features, is such a process.

2. Coal cleaning processes should be refined to their maximum potential. Promising new concepts in coal desulfurization should be supported.

3. Processes for desulfurization of fuel oil are being developed by several petroleum companies. It is believed that NAPCA cannot, nor should it, contribute significantly to these developments.

4. Probably, much of the NO_x will have to be removed from stack gases or combustion temperatures controlled to reduce its

generation. Only two of the SO_2 processes under development appear to be potentially effective in removing oxides of nitrogen. *Research on ways to combine SO_2, NO_x and particulate abatement should be supported.*

5. NAPCA should employ a *process engineering and construction firm* to project costs on a *common basis* for all of the promising processes at various stages in their development. This not only would provide more reliable estimates of the ultimate cost of sulfur control, but also would provide NAPCA with a valuable guide in contract allocation and scale-up decisions.

6. Recovery of sulfur in the elemental form is desirable for storing and handling. Though acid-producing processes will find application in special marketing situations, acid sales will generally be limited by shipping costs.

7. Most of the processes using regenerable absorbents or adsorbents produce SO_2. The conversion of SO_2 to elemental sulfur is not a common industrial process, and it is important that the technology of this conversion be thoroughly studied.

8. The following general considerations should be kept in mind in choosing processes for development:

   a. Insertion of equipment ahead of the air preheater is a radical change in power plant design that may find slow acceptance in the power industry.

   b. Parallel absorber-regenerators, which require shifting the gas flow from one vessel to another, will necessitate large investments in

dampers or other flow control apparatus.

c. Solid absorbents are subject to attrition and to chemical deterioration.

d. Finely divided solid adsorbents are difficult to recover completely from the gas stream.

e. Processes that involve flow of the stack gas through all the equipment, both for absorption and regeneration (or other type of product recovery), have relatively high capital cost.

f. High absorbent loading and good mass transfer and sorption kinetics are important in keeping equipment size at a minimum.

g. Gas reheating, while expensive, may be needed to take care of the loss of buoyancy of stack gas in some treatment processes.

h. Impurities will accumulate and cause trouble in absorbent-recycle processes.

i. The disposition of sulfate formed is a major problem in any absorption process.

j. Processes that lead to fertilizer products may be desirable under some circumstances, because much of the recovered sulfur can be used by the fertilizer industry.

F. PROCESS DEVELOPMENT

1. General Considerations of Individual Processes

Brief commentaries on each class of the processes reviewed by the panel are presented here with special emphasis on the general process considerations. In each of the descriptions, the current level of knowledge about the process is reflected in the state of process development (bench, pilot, or demonstration level).

Generally speaking, bench-scale work may proceed for several years, depending upon what is already known about each of the individual steps of the process. Pilot-plant design and construction may take from a few months to more than a year following completion of bench-level work. Normally, the pilot plant would be operated for about 1 year. Scale-up, together with design and construction of a demonstration plant, following successful pilot-plant studies, takes from 1 to 2 years. Demonstration work will take 1 to 3 years to provide adequate information about the process. Thus, a process for which bench-scale studies have been completed is generally at least 4 1/2 years away from industrial feasibility, assuming success in subsequent studies. The schematic in Figure 3 summarizes the time scale for process development.

The panel was impressed by the readiness with which full information concerning the several proprietary processes was disclosed and has no reason to suspect that there is a major domestic effort on SO_2 control that has not been reported because of proprietary reasons.

A wide variety of processes are being considered in the United States (Appendix C) and in foreign countries (Appendix D). A number of these are reviewed here--particularly those that are receiving the most attention in the United States. In most cases, the developers are seeking funds from industry or Federal agencies, or some combination of the two to supplement corporate funds in expediting

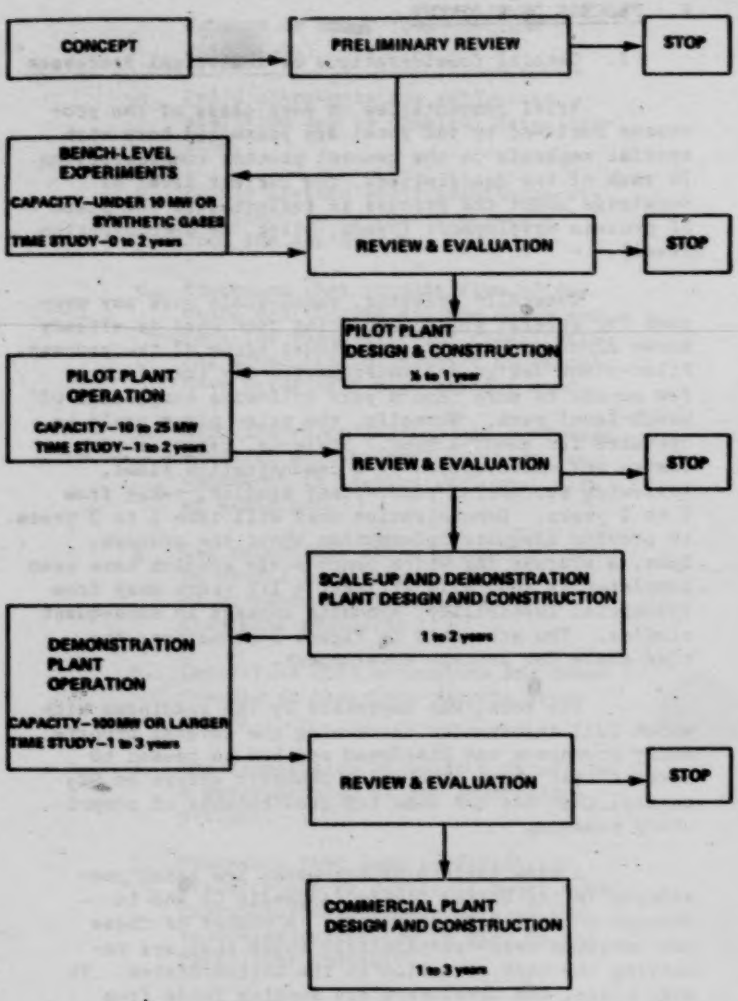


Figure 3. Time scale for process development.

the next level of feasibility investigation and reducing the time required for full-scale demonstration.

2. Precombustion Processes

Coal cleaning and coal gasification are processes that attempt to overcome the sulfur oxide emission problem prior to combustion. The processes have the potential advantage of removing the sulfur at higher concentrations than are present in the stack gas. They also provide for the recovery of sulfur or pyrite and would contribute to the conservation of this resource.

a. Coal Cleaning

Coal washing or beneficiation by present methods is limited to reduction of pyritic sulfur and can be expected to yield only a moderate increase in the supplies of low-sulfur coals. In some cases, sulfur emissions may be controlled by combining coal washing with sulfur removal from stack gases by the dry-limestone or other relatively inexpensive processes.

Coal beneficiation to reduce ash content has been a regular practice of the industry for years. Some pyrite is also removed, but only in the past few years has specific attention been directed toward sulfur removal by this procedure. The sulfur in many coals is present in about equal parts as pyrite and organic substances. Differences in the specific gravity of coal and pyrite are the basis for accomplishing sulfur removal; however, only part of the pyrite sulfur can be removed by gravity cleaning methods. The pyrite is present as nodules on cleat faces, and as disseminated small veins and crystals. In some coals, the larger pyrite particles may be partially freed by crushing and grinding the coal. Some types of coal are more easily cleaned than others, depending upon the manner and form in which the pyrite is present. Experiments with organic solvents, such as hexane, to remove the organic sulfur indicate that prohibitive costs would be involved.

The coal cleaning process produces a pyrite-rich reject as well as the cleaned coal. The reject stream may be further separated into a concentrated pyrite and a high-sulfur fuel. These may be used, respectively, for sulfuric acid manufacture and in a combustion unit with flue gas scrubbing or some other means of SO_2 control.

The Bureau of Mines and Bituminous Coal Research have had active programs in air cleaning and coal preparation for years. Pilot tests on air and water classification and other means of removing pyrite from coal have been made. Studies include the technology of pyrite separation, washability tests, evaluation of standard coal cleaning equipment, in addition to flue gas processing.

b. Coal Gasification

Present projections indicate that the cost of generating electricity from low-sulfur gas produced from coal will be greater than the cost of obtaining the same energy directly from coal. Coal gasification's potential will depend greatly on the availability of natural gas and on the cost of alternative methods for SO_2 control. Because gasification is potentially an alternative method of reducing SO_2 emissions to the atmosphere, the panel suggests that consideration be given to less sophisticated and possibly less costly gasification processes that would produce a relatively clean lower-heating-value gas, suitable for onsite use, but not of pipeline quality.

The Office of Coal Research has an active program for the development of pipeline gas and liquids from coal. While the manufacture of pipeline-quality gas from coal is not competitive at present, it appears that it may become so, as gas demand increases, natural gas reserves decline, and the technology of gasification processes improves in the next 5 to 10 years.

At present at least four processes are being considered:

1. Hydrogasification--Institute of Gas Technology

2. CO_2 Acceptor--Consolidation Coal Company

3. Two-Stage Super-Pressure Gasification--Bituminous Coal Research

4. Molten Salt Process--Kellogg Company

These processes require preliminary grinding, and those using lignite require drying. For coal hydrogasification, a mild air-oxidation pretreatment is used to avoid agglomeration in the hydrogasifier. The BCR process uses high pressure combustion to provide heat in the gasifier; the Kellogg process circulates hot molten salt to the gasifier; and the CO_2 Acceptor process employs the reaction of calcined dolomite with CO_2. Hydrogen is obtained by reacting char and steam. All processes require purification plus methanation to upgrade the gasifier effluent to gas of pipeline quality. During the purification step, sulfur is removed as an H_2S feed for a Claus plant.

The Institute of Gas Technology Hygas process is the nearest to commercialization and, assuming success in the pilot studies, will be commercially available in the late 1970's. IGT is starting up a 5-ton-per-day pilot plant, funded by the Department of the Interior Office of Coal Research, in Chicago for further study of the Hygas process. Only recently has attention been given by IGT to production of gas of less than pipeline quality for power plant fuel.

In addition to the research being supported by the Office of Coal Research, several companies are developing coal gasification processes of their own to produce either pipeline or sub-pipeline quality gas. It should be noted that low-heating value gasification processes will require sulfur removal from volumetric flows only slightly smaller than stack gas rates, thereby reducing the advantage of easier sulfur removal resulting from the higher concentrations.

3. Combustion Processes

The new combustion processes remove the sulfur during burning by methods that do not require extensive stack gas cleanup. Some of the more promising processes that offer the possibility of being brought to commercial acceptability in the later 1970's are discussed below. These processes also offer the possibility of sulfur recovery and the corresponding conservation of sulfur resources.

The combustion processes proposed for sulfur oxide control require new concepts of boiler design. The manufacturers and utilities have standardized boiler design to the extent that few major changes have been made in recent years. Additional effort will be required to obtain acceptance of these processes by industry since changes in manufacturing procedures and in operation will be necessary. The processes offer some of the more logical approaches to sulfur oxide emission control and deserve the extra level of support that will ensure their full consideration.

a. Fluidized Bed Combustion (FBC) is a new concept in boiler design and would be applicable only to new plants. The burning fuel is contacted with a fluidized bed of limestone particles which react with the sulfur. A portion of the bed is continuously removed and replaced with fresh limestone. Several FBC systems are being studied in England. The (British) National Coal Board is conducting research on atmospheric and pressurized systems. Esso Research Ltd. has been developing a two-stage FBC unit in which high-sulfur residual fuel oil is burned and sulfur values recovered. In the United States, the firm of Pope, Evans, and Robbins (under sponsorship of the Office of Coal Research and the National Air Pollution Control Administration) has conducted pilot plant work and studied the applicability of fluid bed combustion to industrial boiler systems. The National Coal Board projects that scale-up, from current laboratory testing, to a 20- to 30-MW single-stage atmospheric pilot unit can be completed by 1972.

b. The Black, Sivalls, and Bryson Combustion Process is a new concept in boiler design, in which sulfur oxide formation is prevented by the submerged partial combustion of coal in a bath of molten iron. The resulting carbon monoxide is burned above the molten bath. The sulfur is removed with the ash-slag and is subsequently recovered as sulfur. Black, Sivalls, and Bryson are conducting feasibility studies and have begun pilot plant design.

4. Limestone Processes

The limestone processes for sulfur oxide removal should be given priority in terms of research money and encouragement, because sufficient work has been done on these processes to suggest that they may become commercially acceptable sooner than any of the processes that produce salable products. Moreover, it appears that, for some applications, the net cost of throw-away processes may be less than for a recovery process. This is particularly true of a station that has been in operation for some time, since amortization of the cost of the control equipment would be over the remaining life of the plant, and the load factor of the plant would be lower in its later years.

Problems may arise with limestone because of limitations on the space available for disposal of waste products. In some locations, this could be expensive and tip the balance toward a recovery process. On the other hand, the dry-limestone process can be used intermittently for incident control, and thereby reduce the amount of material handled. This could be done in certain areas of high pollution levels where local control at specific times is needed.

The possibility that the limestone-based processes may solve an air pollution problem but create a water pollution problem is one reason that the panel endorsed NAPCA's plan to install plant-scale test facilities at TVA, where full consideration will be given to various ways of handling air and water pollution and solid wastes. The government effort has merit because the plans are to study the situation not only for dry-limestone but also for scrubber design

alternatives; this would expand the applicability of the limestone processes. In addition, the technology developed for SO_2 removal by limestone-wet scrubbing will contribute to the general knowledge of wet scrubbers, and this will be useful in other wet scrubbing processes.

The panel does not favor the dry- or wet-limestone processes exclusively, but merely as a stop-gap or a first line of defense. There are other processes that will have to be developed to provide more adequate control of emissions. Limestone injection technology seems nearest to industrial application and therefore deserves priority in the near term.

The limestone processes appear to be applicable to many existing power plants. Because they do not produce a salable product, the limestone processes should appeal to utilities not wishing to get into the chemical business. The lower capital costs make these processes attractive to the older plants operating with low-load factors. There is added cost for the additional fly ash removal, and there is a probable increase in particulate emissions resulting from the increased precipitator load for the dry removal process.

While the limestone processes are generally thought of as not producing a salable product, there is the possibility of recovering sulfur dioxide by heating the calcium sulfite portion of the recovered solids. With control of oxidation to sulfate, this could provide for recovery of most of the sulfur dioxide and reuse of the limestone. This area will also be covered in the TVA study.

a. Limestone-Wet Scrubbing was originally studied at Battersea in London, England, and at the Tir John Power Plant in Swansea, Wales, during the 1930's. In this early work 90 percent removal of SO_2 was obtained [20] confirming the technical capability of the process. However, the work also identified specific problems of low reliability, high maintenance and operating costs, corrosion, abrasion, scale deposit, solid waste disposal and loss of plume buoyancy.

Current studies in the United States and other countries are attempting to overcome these problems through improved process and equipment design, closer control of operating parameters, improved materials, systems optimization, and reliability.

Limestone-wet scrubbing may be added to existing plants without significant boiler modification. Limestone may be injected into the boiler as well as added to the scrubbing liquor. Solids disposal will be several times the normal fly ash disposal rate. The Combustion Engineering Company has recently built two full-scale units at the Meramec Plant of the Union Electric Company in St. Louis and at the Lawrence Plant of the Kansas Power and Light Company. Each unit is designed to handle all the flue gas from a 125-MW boiler. Both plants have had start-up troubles but are expected eventually to meet the design objectives of 83 percent sulfur removal and 98 percent particulate removal. However, Kansas Power and Light Company is proceeding with plans for a 430-MW power plant, using the limestone-wet scrubbing process. Problems of scrubber optimization and waste disposal may require several years of additional study and are further discussed at the end of this chapter.

b. Limestone-Dry Removal uses an electrostatic precipitator. The process may be added to existing plants. Reaction time and temperature requirements are such that the process may not be applicable to cyclone-fired boilers. Solids disposal problems will be several times the normal fly ash disposal rate. The Tennessee Valley Authority is installing a 175-MW demonstration unit at its Shawnee plant near Paducah, Kentucky.

5. Processes for Sulfur Recovery from Stack Gases

Several processes for recovering sulfur from the stack gas following combustion are at or near the demonstration level. These processes will recover the sulfur oxide and convert it into products for the chemical industry, such as sulfuric acid, hydrogen sulfide, sulfur oxides, and elemental sulfur.

Domestic reserves of sulfur are limited, and consideration should be given to their conservation. It would be desirable to *conduct a study of the long-range supply and demand situation with regard to the several alternative by-products to aid in establishing priorities for support of control and abatement technology.* Most of the processes reviewed rely on relatively straightforward chemical reactions and processing equipment. The major technical problems are related to the low concentration of SO_2 in large volumes of flue gas containing a variety of corrosive materials.

a. The Cat-Ox Process of Monsanto Company is a direct translation of the contact sulfuric acid process. Boiler modifications are needed as the converter uses gas at temperatures of 700° F to 900° F. The process has been successfully piloted (15-MW equivalent) at the Portland, Pennsylvania, station of Metropolitan Edison Company. Monsanto has proposed the pilot unit as a modular alternative to commercial-scale demonstration. It is especially applicable to high-sulfur fuels, such as coal-cleaning middlings and ore smelting. This process could be commercially demonstrated by 1973.

b. The Wellman-Lord Process is an add-on process and does not require boiler modifications. Sulfur dioxide is recovered from the stack gas by scrubbing and reprocessing the scrubbing solution. During 1969, a 25-MW pilot study was conducted at the Crane Station of the Baltimore Gas and Electric Company. W. R. Grace Company, the Bechtel Corporation, Potomac Electric Power Company, Delmarva Power and Light Company, and Potomac Edison Company also participated in this study. A commercial Wellman-Lord recovery plant is being installed to recover SO_2 from the stack gas of a contact sulfuric acid plant of the Olin Mathieson Chemical Corporation at Paulsboro, New Jersey.

c. The Esso-Babcock and Wilcox Dry Adsorbent Process requires boiler modification to provide 900° F gas. Regeneration of the adsorbent produces sulfur

dioxide for a sulfuric acid plant. A 2,000 CFM bench-scale unit is in operation, and a 25-MW pilot plant is planned. If this is successful, a demonstration unit costing approximately $7.5 million is planned, with the objective of developing a commercial process by 1973. Sixteen utilities in the midwest and eastern United States and Canada are cooperatively funding the project.

d. Magnesium Oxide Scrubbing is an add-on process in which the scrubber removes both sulfur oxides and particulates. Chemico proposes a central recovery plant to remove sulfur dioxide and recycle the magnesium oxide to the power plants. Chemico and Basic Chemicals are conducting pilot studies of the process.

e. The Formate Scrubbing Process is an add-on process in which the reprocessing of the scrubbing solution yields a feed gas for a Claus plant for sulfur recovery. Bench-scale studies have been conducted by Consolidation Coal Company.

f. Ammonia Scrubbing of stack gases can be done as an add-on process without boiler changes. Sulfur dioxide can be stripped from the scrubbing liquid, using heat, or the solution can be acidified with nitric, sulfuric, and phosphoric acids to produce various fertilizers. Bench-scale studies were made some years ago. The renewed interest in the process lies mainly in the decrease in the price of ammonia in recent years.

g. The Westvaco Char Process is an add-on process. A source of hydrogen is needed for regeneration of the adsorbent/catalyst char and to produce a feed stream for a Claus sulfur recovery plant. Pilot-level studies are being conducted by Westvaco.

h. The Molten Carbonate Process is intended mainly for new plants with modified boilers to provide the gas at 900° F. Reprocessing of the scrubbing melt produces a feed gas for a Claus sulfur recovery plant. Bench-scale studies have been made by Atomics International.

i. Sodium Bicarbonate Adsorption is an add-on process that removes both sulfur oxide and fly ash. Pilot-level studies have been conducted by Dow Chemical Company.

j. The Modified Claus Process is an add-on process and is an extension of the conventional Claus sulfur process. A source of hydrogen (natural gas) is needed for the process to recover sulfur. Princeton Chemical Research has conducted bench-scale studies of the process.

k. The Catalytic Chamber Process is a modification of the old lead chamber process and removes both sulfur and nitrogen oxides and produces sulfuric acid. It is an add-on process that requires some additional space. Bench-scale studies have been conducted by Tyco Laboratories.

l. The Ionics/Stone & Webster Process uses a scrubber and an electrolytic cell system to recover sulfur dioxide for subsequent sulfuric acid production. It is an add-on process that requires a significant amount of power. Pilot-level studies have been conducted by Ionics and Stone & Webster.

m. The Alkalized Alumina Process has received significant attention. Attrition of the alkalized alumina has been a continuing problem. Recent detailed engineering and cost analysis (by M. W. Kellogg) suggests that further work on this process is unjustified.

6. Scrubber Development

There is a wide variety of SO_2 removal processes that use scrubbers as the principal chemical contactor. Some, such as the lime scrubbing process, employ reactants that may cause scaling and plugging of equipment because of the precipitation of solids, while others, such as sodium salt scrubbers, use clear liquids containing no solids. Nearly all scrubber applications require corroision studies and materials evaluation. The problem is not simply a matter of

finding a single best scrubber for all applications, but to develop a scrubber technology for a variety of applications. Consequently, NAPCA plans to look at several scrubber types on a small scale in an effort to characterize process chemistry combinations and generate the background data necessary to select the best scrubber for the specific process. In this way scale-up would not be repeated for every promising process.

The proposal for work to be done by the TVA on the wet-limestone process involves a large development and testing effort on scrubbers. This same installation could conceivably be utilized with some modification to test other wet scrubber sulfur recovery processes, when technology reaches the stage at which testing on this scale is justified.

APPENDIX A

LIST OF PRESENTERS

The following organizations made presentations to the Panel on Control of SO_2 from Stationary Combustion Sources:

Babcock & Wilcox
Bituminous Coal Research, Inc.
Black, Sivalls, & Bryson, Inc.
Chemical Construction Corporation
Combustion Engineering, Inc.
Continental Oil Company
(Consolidation Coal Company, Inc.)
The Dow Chemical Company
ESSO Research and Engineering Company
Institute of Gas Technology
Ionics Incorporated/Stone & Webster
The M. W. Kellogg Company
McNally Pittsburg Manufacturing Corporation
Monsanto Company
National Air Pollution Control Administration
North American Rockwell Corporation
(Atomics International Division)
Office of Coal Research
Pope, Evans and Robbins
Princeton Chemical Research Company
Roberts & Schaefer Company
Tennessee Valley Authority
Tyco Laboratories, Inc.
Wellman-Lord, Inc.
WESTVACO

APPENDIX B

LIST OF CORRESPONDENTS

The following companies sent in material to the panel describing their activities and experience on control of SO_2 from stationary combustion sources:

Abcor, Inc.
The Air Preheater Company, Inc.
Air Products and Chemicals, Inc.
American Petroleum Institute
Basic Chemicals
The Carborundum Company
The Detroit Edison Company
Edison Electric Institute
Institute of Gas Technology
Joy Manufacturing Company
(Western Precipitation Division)
Kaiser Aluminum & Chemical Corporation
(Kaiser Chemicals Division)
The Kansas Power and Light Company
Nalco Chemical Company
Pennsylvania Electric Company
Precipitair Pollution Control, Inc.
Research-Cottrell, Inc.
Reynolds Metals Company
Reynolds, Smith and Hills
Slick Industrial Company
(Pulverizing Machinery Division)
Union Electric Company
United International Research, Inc.
Universal Oil Products Company
(Air Correction Division)
The Wheelabrator Corporation

APPENDIX C

UNITED STATES SO_2 POLLUTION CONTROL RESEARCH AND DEVELOPMENT*

Company	Type of Work
Abcor, Inc.	Aqueous absorption systems for SO_2
Air Products and Chemicals, Inc.	Dry process for SO_2 removal
American Iron and Steel Institute	Studies of sulfur pollution control from various iron and steel manufacturing steps
Argonne National Laboratory	Reduction of atmospheric pollution by the application of fluidized bed combustion
Babcock & Wilcox	Magnesium oxide scrubbing system and other SO_2 removal processes
Basic Chemicals	Magnesium slurry scrubbing (in conjunction with Chemico)
Bituminous Coal Research, Inc.	Use of limestone or dolomite for SO_2 removal from coal-burning boiler flue gases
Bituminous Coal Research, Inc.	Removal of pyritic sulfur from coal
Black, Sivalls, & Bryson, Inc.	Coal gasification in molten iron; sulfur removal in slag
The Carborundum Company	Limestone injection with wet scrubbing or bag filtration
Chemical Construction Corporation	Various projects for SO_2 control from sulfuric acid plants and power plants
Combustion Engineering, Inc.	Limestone injection-wet scrubbing process

*Compiled by NAPCA, March 1970.

Company	Type of Work
(Kansas Power and Light Company)	Demonstration of Combustion Engineering limestone injection-scrubbing process
(Union Electric Company)	Demonstration of Combustion Engineering limestone injection-scrubbing process
Consolidation Coal Company, Inc.	Flue gas scrubbing, fluidized combustion in a lime bed, and pyrite removal from coal
The Detroit Edison Company	Limestone scrubbing, ammonia injection
The Dow Chemical Company	Gas-phase removal of SO_2 with solid alkaline materials
Edison Electric Institute	Dispersion characteristics of stack effluents, development of a formula for stack design
ESSO Research and Engineering Company	B&W-Esso proprietary process for SO_2 removal
General American Transportation Corporation	Catalytic reduction of SO_2 to sulfur
Hydrocarbon Research, Incorporated	Catalytic hydrogenation of fossil fuels
Illinois Institute of Technology Research Institute	Oxidation and reduction catalysts
Institute of Gas Technology	Coal Gasification
Ionics Incorporated/ Stone & Webster	Regenerable aqueous scrubbing system for SO_2 removal and recovery (Stone & Webster-Ionics process)
Kaiser Chemicals	Improved dry sorbent for SO_2 removal
The M. W. Kellogg Company	Undisclosed process for power plant SO_2 removal
Monsanto Company	Catalytic oxidation of SO_2 with recovery of sulfuric acid
(Pennsylvania Electric Company)	Development of Monsanto catalytic oxidation process
(Air Preheater Company)	
(Research-Cottrell)	

Company	Type of Work
Nalco Chemical Company	Dry sorbent for SO_2
Petroleum Industry (Source: API)	Industry-wide R&D for sulfur oxides control
Pope, Evans & Robbins	Control of gaseous emissions from coal-fired fluidized-bed boilers
Precipitair Pollution Control, Inc.	Gas-phase removal of SO_2 with solid alkaline materials, and collection with fabric filters (cooperative work with Southern California Edison)
Pulp and Paper Industry (Source: NCASI)	Sulfur oxides control from sulfite and kraft pulping processes
Research-Cottrell, Inc.	Scrubbing equipment development
Reynolds Metals Company	Dry sorbents for SO_2 removal
Reynolds, Smith, and Hills	Scrubbing process for flue gas SO_2 removal
Slick Industrial Company	Dry SO_2 sorbent development
Southern California Edison Company	Gas-phase removal of SO_2 with solid alkaline materials, and collection with fabric filters
Stone & Webster	Regenerable aqueous scrubbing system for SO_2 removal and recovery (S&W-Ionics process)
United International Research, Incorporated	Regenerable scrubbing process removal; SO_2 converted to H_2SO_4
U.S. Bureau of Mines-Morgantown	Study of corrosion/erosion and of coal type during fluidized bed combustion
U.S. Stoneware Company	Process for SO_2 control from sulfuric acid plants
Universal Oil Products	Dolomite slurry scrubbing; catalytic hydrogenation of fuels

Company	Type of Work
Wellman-Lord, Incorporated	R&D of regenerable wet scrubbing process at Lakeland, Florida, and Tampa Electric, plus direct reduction of SO_2 to sulfur
Tampa Electric Company	Pilot study of Wellman-Lord process, contributed to Stone & Webster
(Bechtel Corporation)	Demonstration plant of Wellman-Lord process at Baltimore Gas and Electric power station
(Baltimore Gas and Electric Company)	Demonstration plant of Wellman-Lord process at BG&E power station in Baltimore
(Potomac Electric Power Company)	
(Delmarva Power and Light Company)	
(Potomac Edison Company)	
Western Precipitation Group (Joy Manufacturing Company)	Scrubbing equipment development
Westinghouse R&D Center	Evaluation of the fluidized bed combustion process
Westvaco	Adsorption of SO_2 by activated carbon
The Wheelabrator Company	Scrubbing equipment development
Wisconsin Electric Power	Lime scrubbing, other aqueous scrubbing systems

APPENDIX D

FOREIGN SO_2 POLLUTION CONTROL RESEARCH AND DEVELOPMENT*

Company	Type of Work
Australia	
Commonwealth Science Industrial Research Organization	Fluidized bed combustion
Czechoslovakia	
Research Institute of Inorganic Chemistry	Ammonia scrubbing of SO_2 effluent
Czech acid plant scrubbing	Ammonia scrubbing on H_2SO_4 plant tail gas
Fuel Research Institute	Fluidized bed combustion
Institute of Mines	Desulfurization of coal
England	
Esso Research Center	Fluidized bed combustion of oil
National Coal Board Coal Research Establishment	Fluidized bed combustion of coal
BCURA Industrial Labs	
LHF Patented Process Esso Research	Desulfurization of coal
Bankside and Battersea Process	Alkaline water scrubbing on Thames River
France	
Societe Nationale Des Petroles	Catalytic oxidation of flue gas
D'Aquatane (joint project with Halder Topsoe of Denmark)	
Ugine Kuhlmann-Weirtam Process	Ammonia scrubbing of flue gas
Societe Anonyme Activit Neyric	Fluidized bed combustion Desulfurization of coal

*Compiled by NAPCA, March 1970.

Company	Type of Work
Germany	
Bayer Double Contact Process	Two-stage catalytic oxidation of H_2SO_4 tail gas
Bischoff Process	Lime/Limestone scrubbing of flue gas
Lurgi Sulfacid Process	Wet char sorption of SO_2 from effluent
Activated Carbon Adsorption Bergbau-Forschung	Wet char sorption of SO_2 from effluent
Activated Char Sorption Bergbau-Forschung	Dry char sorption of SO_2 from gaseous effluent
Grillo Process	Sorption by proprietary mixture of metal oxides
Siemens-Schuchert Process	Sorption on iron oxides in silica gels
Holland	
Shell CuO process	Sorption on proprietary mixture of copper based metal oxides
NVCP (Nederlandsch Verkoopkantoor voor Chemische Producten N.V.)	Hydro desulfurization of oil
Italy	
University of Cagliari	Desulfurization of coal
Japan	
Kiyoura Ammonium Sulfate Process	Catalytic oxidation of flue gas
Nippon Kokan Ltd.	Lime/Limestone scrubbing of flue gas
Japan Engineering and Construction Co. (JECCO)	Lime/Limestone scrubbing of flue gas
Showa-Denko Process	Ammonia scrubbing
Hitachi Activated Carbon Process	Wet char sorption of SO_2 from effluent
Central Research Institute of the Electric Power Industry	Dry limestone injection for SO_2 control of flue gas
Resources Research Institute	Dry limestone injection for SO_2 control of flue gas
Mitsubishi DAP-Manganese Process	Manganese oxide sorption
Kanagawa	Aqueous scrubbing

Company	Type of Work
Poland	
Dry Ammonia Injection	Injection of gaseous ammonia into flue gas
Sweden	
BAHCO Lime-scrubbing Process	Lime/Limestone scrubbing of flue gas
U.S.S.R.	
Wet Limestone scrubbing at Kusnetsk Abagur Plant	Lime/Limestone scrubbing
Ammonia and sodium carbonate scrubbing-Voskresenskij Chemical Industry	Ammonia scrubbing
I.M. Gubkin Institute of Petroleum and Others	Fluidized bed combustion
Academy of Science	Desulfurization of coal
Lensovet Technological Institute	Desulfurization of oil
Yugoslavia	
Institute of Mines	Desulfurization of coal

APPENDIX E

BIBLIOGRAPHY

1. Executive Office of the President. Office of Science and Technology. Energy Policy Staff. *Federal Research and Development for Civilian Energy Production, Conversion and Transmission.* Washington: Office of Science and Technology, September 8, 1969. 9 p.

2. ———. *Considerations Affecting Steam Power Plant Site Selection.* Washington: Office of Science and Technology, December 1968. 133 p.

3. Holcomb, R. W. *Power Generation: The Next 30 Years.* Science, 167: 159-160, January 9, 1970.

4. Institute of Gas Technology. *LNG: A Sulfur-Free Fuel for Power Generation.* Springfield, Virginia: Clearinghouse for Federal Scientific and Technical Information, May 1969. (various pagings). (PB 184 353)

5. Linzon, S. N. *The Influence of Smelter Fumes on the Growth of White Pine in the Sudbury Region.* Toronto: Ontario Department of Lands and Forest, Ontario Department of Mines, 1958. 45 p.

6. McCormick, Robert A. and John H. Ludwig. *Climate Modification by Atmospheric Aerosols.* Science, 156(3780): 1358-1359, June 9, 1967.

7. *Minutes of the Air Quality Control Advisory Council.* January 28, 1970. Baltimore: State of Maryland, Department of Health, Air Quality Control Division.

8. National Academy of Sciences-National Research Council. Committee on Resources and Man. *Resources and Man.* San Francisco: W. H. Freeman and Company, 1969. 259 p.

9. *Operating Characteristics of a High Temperature Electrostatic Precipitator.* Report RI 7276. Washington: U. S. Bureau of Mines, July 1969. 45 p.

10. President's Science Advisory Committee. Environmental Pollution Panel. *Restoring the Quality of Our Environment.* Washington: U. S. Government Printing Office, 1965. 317 p.

11. Robinson, E., and R. C. Robbins. *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants.* SRI Project PR-6755. New York: American Petroleum Institute, February 1968. 123 p.

12. Steinberg, M., J. Powell, and B. Manowitz. *The Western Coal Deposits: A National Source of Power.* Preprint of Report BNL 50187 (T-542). Upton, New York: Brookhaven National Laboratory, June 1969. 54 p.

13. U. S. Atomic Energy Commission. Division of Industrial Participation. *The Nuclear Industry--1969.* Washington: U. S. Government Printing Office, 1969. 338 p.

14. Upham, J. B. *Atmospheric Corrosion Studies in Two Metropolitan Areas.* J. Air Pollution Control Association, *17:* 393-402, June 1967.

15. Wicken, A. J., and S. F. Buck. *Report on a Study of Environmental Factors Associated with Lung Cancer and Bronchitis Mortality in Areas of North East England.* London: Tobacco Research Council, 1964. (Research Paper 8)

16. U. S. Department of Health, Education, and Welfare. Public Health Service. Consumer Protection and Environmental Health Service. National Air Pollution Control Administration. *Air Quality Criteria for Carbon Monoxide.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-62)

17. _____. *Air Quality Criteria for Hydrocarbons.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-64)

18. _____. *Air Quality Criteria for Particulate Matter.* Washington: National Air Pollution Control Administration, January 1969. (NAPCA Publication AP-49) 211 p.

19. _____. *Air Quality Criteria for Photochemical Oxidants.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-63)

20. _____. *Air Quality Criteria for Sulfur Oxides.* Washington: National Air Pollution Control Administration, January 1969. (NAPCA Publication AP-50) 178 p.

21. _____. *Control Techniques for Carbon Monoxide Emissions from Stationary Sources.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-65)

22. _____. *Control Techniques for Carbon Monoxide, Nitrogen Oxides, and Hydrocarbon Emissions from Mobile Sources.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-66)

23. _____. *Control Techniques for Hydrocarbons and Organic Solvent Emissions from Stationary Sources.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-68)

24. _____. *Control Techniques for Nitrogen Oxides Emissions from Stationary Sources.* Washington: National Air Pollution Control Administration. (NAPCA Publication AP-67)

25. _____. *Control Techniques for Particulate Air Pollutants.* Washington: National Air Pollution Control Administration, January 1969. (NAPCA Publication AP-51) 215 p.

26. _____. *Control Techniques for Sulfur Oxide Air Pollutants*. Washington: National Air Pollution Control Administration, January 1969. (NAPCA Publication AP-52) 122 p.

27. _____. *The Climate of Cities: A Survey of Recent Literature*, by James T. Peterson. Washington: U. S. Government Printing Office, October 1969. (NAPCA Publication AP-59) 48 p.

Supreme Court, U. S.
FILED
OCT 10 1973
MICHAEL RODAK, JR., CLERK

APPENDIX

EXHIBITS (Pages 1381-1876)

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972

Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

Appellant

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

INDEX

		Page
Government Exhibits:		
GX 1—	Annual Report of General Dynamics Corporation 1960	1
GX 2—	Annual Report of General Dynamics Corporation 1961	3
GX 3—	Annual Report of General Dynamics Corporation 1962	5
GX 4—	Annual Report of General Dynamics Corporation 1963	6
GX 5—	Annual Report of General Dynamics Corporation 1964	7
GX 6—	Annual Report of General Dynamics Corporation 1965	8
GX 7—	Annual Report of General Dynamics Corporation 1966	9
GX 24—	Chart entitled "The United Electric Coal Companies Fixed Assets, Long Term Indebtedness, Working Capital and Net Assets or Stockholders Equity 1940 to 1967"	10

Government Exhibits:—Continued		Page
GX 25—	Chart entitled "The United Electric Coal Companies Net Sales, Earnings Before Income Taxes, Net Earnings, and Net Earnings as a Percentage of Net Sales 1940 to 1968"	12
GX 26—	Standard & Poor's Industry Surveys—"Coal," April 28, 1966, Section 2, Basic Analysis	13
GX 27—	Letter dated March 26, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Declared and Paid by UEC during the period January 1, 1950 to December 31, 1967	29
GX 29—	Standard Industrial Classification Manual 1967	33
GX 31—	Chart entitled "The Consumption of Fuel by Steam-Electric Plants in the Eastern Interior Province Sales Area for the Years 1960-1967"	37
GX 32—	Chart entitled "Consumption of Fuel (Shown in Millions of BTU's) by Portland Cement Plants in Illinois in 1967" and Chart entitled "Consumption of Fuel by Portland Cement Plants in Eastern Interior Coal Province Sales Area in 1967"	38
GX 34—	Financial Statements: The United Electrical Coal Companies; Year Ended December 31, 1968	40
GX 35—	City, Water, Light & Power (Springfield) letter to Department of Justice dated March 21, 1968	42
GX 36—	Illinois Power Company letter to Department of Justice dated March 21, 1968	46
GX 37—	Dairyland Power Cooperative letter to Department of Justice dated April 23, 1968	53
GX 39—	Corn Products Company letter to Department of Justice dated May 24, 1968	57
GX 41—	Union Carbide Corporation letter to Department of Justice dated August 2, 1968	60
GX 43—	Dundee Smith Company letter to Department of Justice dated August 22, 1968	62
GX 49—	A Staff Report on National Gas Supply and Demand by the Federal Power Commission	65
GX 51—	Chart entitled "Coal Shipments to Illinois Destinations by District of Origin, 1965 to 1967"	67
GX 52—	Chart entitled "1967 Sales of Coal in the Eastern Interior Coal Province Sales Area by Coal Producers Located in Illinois, Indiana and Western Kentucky"	68
GX 54—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Crown Mine to Customer Destinations, 1967	73
GX 55—	Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 3 Mine to Customer Destinations, 1967	74

Government Exhibits:—Continued Page

GX 56— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 4 Mine to Customer Destinations, 1967 ____ 75
GX 57— Freeman Coal Mining Corporation; Shipments of Coal in Tons from the Orient No. 5 Mine to Customer Destinations, 1967 ____ 76
GX 58— The United Electric Coal Companies; Shipments of Coal in Tons from the Banner Mine to Customer Destinations, 1967 ____ 77
GX 59— The United Electric Coal Companies; Shipments of Coal in Tons from the Cuba-Buckhart Mines to Customer Destinations, 1967 ____ 78
GX 60— The United Electric Coal Companies; Shipments of Coal in Tons from the Fidelity Mine to Customer Destinations, 1967 ____ 79
GX 61— Chart entitled "Total Coal Consumption in Tons in 1967 by Steam Electric Plants in the Eastern Interior Coal Province Sales Area and the Total Sales of Coal in Tons in 1967 from Mines located in the Eastern Interior Coal Province to Steam Electric Plants in the Eastern Interior Coal Province Sales Area" ____ 80
GX 62— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1957 Calendar Year" ____ 81
GX 63— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1958 Calendar Year" ____ 82
GX 64— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1959 Calendar Year" ____ 83
GX 65— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1960 Calendar Year" ____ 84
GX 66— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1961 Calendar Year" ____ 85
GX 67— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1962 Calendar Year" ____ 86
GX 68— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1963 Calendar Year" ____ 87
GX 69— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1964 Calendar Year" ____ 88
GX 70— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1965 Calendar Year" ____ 89

Government Exhibits:—Continued Page

GX 71— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1966 Calendar Year" 90
GX 72— Chart entitled "Production of Coal in Illinois by the Leading Companies and Their Subsidiaries for the 1967 Calendar Year" 91
GX 73— Chart entitled "Production of Coal in Illinois by the Top Two, the Top Four, and the Top Ten Producers, 1957-1967, and their Percentage of Total Production for These Years" 92
GX 74— Chart entitled "Sales of Coal in Illinois by the Leading Companies and Their Subsidiaries in 1967 (From Mines Located in Eastern Interior Coal Province)" 93
GX 75— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1957" 94
GX 77— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1959" 96
GX 85— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky by the Leading Companies and Their Subsidiaries in Calendar Year 1967" 98
GX 86— Chart entitled "Production of Coal in Illinois, Indiana, and Western Kentucky, 1957-1967" 100
GX 87— Chart entitled "Acquisitions in the Eastern Interior Coal Province since 1954" 101
GX 88— Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1965" 107
GX 89— Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1966" 111
GX 90— Chart entitled "Common Known Customers of The United Electric Coal Companies and Freeman Coal Mining Corporation Showing Destination Points 1967" 114
GX 91— Chart entitled "Per Cent of Sales of Each Company to Identical Customer Facilities by The United Electric Coal Companies and Freeman Coal Mining Corporation for the Year 1965-1967" 117
GX 98— Central Illinois Public Service Company letter to Department of Justice dated October 28, 1966 118

Government Exhibits:—Continued	Page
GX 94— Illinois Power Company letter to Department of Justice dated October 17, 1966	121
GX 104— Central Illinois Electric and Gas Company letter to Department of Justice dated October 20, 1966	124
GX 135— March 26, 1970 Petition of Commonwealth Edison to form subsidiary	126
GX 200— United Electric Coal Companies, Board of Directors Minutes—1959	132
GX 201— United Electric Coal Companies, Board of Directors Minutes—1960	133
GX 210— Testimony of Jack Simon before Illinois Commerce Commission	134
GX 219— Keystone Coal Buyers Manual 1967	137
GX 232— Article entitled "The Energy Outlook", by Gerber and Netschert, entered in the IEEE Spectrum, June 1969	144
GX 233— Speech by J. Cordell Moore entitled "The Future Role of Fossil Fuels in Electric Power Generation," at the American Power Conference luncheon in 1968	167
GX 239— Article entitled "New Horizons for Coal—the Comeback Industry", by Robert E. Lee Hall, printed in *The Commercial and Financial Chronicle*, dated March 7, 1968	176
GX 247— Article entitled "Natural Gas Fiasco", printed in *Barron's*, October 13, 1969	189
GX 253— Article entitled "Nuclear Power Economics," 1968-1969 Report by Philip Sporn to the Joint Congressional Committee on Atomic Energy, reprinted in CCH ¶ 3043	194
Defense Exhibits:	
DX 1— October 9, 1957 memorandum from Frank Kolbe to R. J. Hepburn re punch mining	197
DX 2— October 18, 1957 letter from J. M. Morris to Frank Kolbe re Northern States Power Company, Displacing gas with coal	198
DX 3— June 19, 1958 letter from A. J. Christiansen to A. H. Truax with three page attachment	199
DX 4— July 1, 1958 letter from J. M. Morris to Frank Nugent	204
DX 5— July 11, 1958 letter from R. J. Hepburn to Frank Kolbe with two page attachment	206
DX 6— August 4, 1958 letter from "President" to Mr. Justin Potter	209
DX 7— November 21, 1958 *Wall Street Journal* article "General Dynamics Seeks To Acquire Chicago Building Firm"	210

Defense Exhibits:—Continued		Page
DX 8—	December 11, 1958 letter from Geo. Robert Boller to F. F. Kolbe with one page attachment	212
DX 9—	February 5, 1959 letter from Frank Nugent to F. F. Kolbe	214
DX 11—	May 27, 1959 letter from R. J. Hepburn to F. F. Kolbe	215
DX 12—	October 2, 1959 Paul Weir Co. report to F. F. Kolbe	216
DX 13—	May 27, 1960 letter from T. H. Latimer to R. J. Hepburn	224
DX 14—	August 23, 1960 letter from J. M. Morris to C. Evans Parks, Iowa Southern Utilities Co.	226
DX 15—	September 7, 1960 letter from J. M. Morris to H. L. Mann	228
DX 16—	September 13, 1960 letter from H. L. Mann to J. M. Morris	229
DX 17—	November 15, 1961 letter from J. M. Morris to H. L. Mann	230
DX 18—	June 12, 1962 memorandum from R. J. Hepburn to J. M. Morris re Preliminary Report Sunshine Coal Property, Centerville, Iowa	231
DX 19—	November 30, 1962 letter from H. L. Mann to Robert J. Hepburn	235
DX 20—	December 10, 1962 letter from Robert J. Hepburn to H. L. Mann re Iowa Coal Field	237
DX 21—	March 8, 1963 letter from R. J. Hepburn to J. M. Aiken	238
DX 22—	May 19, 1964 letter to Frank Nugent enclosing one page draft letter to Arch Kraakevik of Illinois Power Co.	239
DX 23—	June 16, 1964 memorandum from Irving Crown to Frank Nugent with four page attachment	241
DX 24—	June 29, 1965 memorandum from J. M. Morris to R. H. Inman et al. re Industry field	246
DX 25—	October 27, 1965 letter from J. M. Morris to Frank Nugent with one page attachment	247
DX 26—	January 5, 1966 letter from Q. W. Wellington to J. M. Morris	249
DX 27—	March 8, 1966 memorandum from Dale H. Emling to J. M. Morris with two page attachment	250
DX 28—	March 14, 1966 letter from J. M. Morris to Frank Nugent	252
DX 29—	July 13, 1966 memorandum from D. H. Emling to R. H. Inman	253
DX 30—	July 29, 1966 memorandum from R. H. Inman to T. H. Latimer, et al.	254
DX 31—	August 9, 1966 memorandum from D. H. Emling and B. C. Jensen to R. H. Inman re Star Lake Field, McKinley County, New Mexico	255

Defense Exhibits:—Continued

		Page
DX 32—	September 12, 1966 letter from J. Morris to Frank Nugent	256
DX 33—	October 18, 1966 memorandum between R. H. Inman and T. H. Latimer	257
DX 34—	July 31, 1967 letter from Jack A. Simon to Frank Nugent	259
DX 35—	September 31, 1968 four-page coal contract between UEC and Central Illinois Light Co.	262
DX 36—	September 5, 1969 letter from John Welsh, Caterpillar Tractor Co., to Reuben Hedlund re coal versus gas feasibility study	263
DX 37—	September 12, 1969 letter from John T. Cusack to Reuben L. Hedlund	264
DX 38—	1965 Annual Report Zeigler: Coke Company	267
DX 39—	1966 Annual Report Zeigler: Coke Company	270
DX 40—	1967 Annual Report Zeigler: Coke Company	272
DX 41—	1968 Annual Report Zeigler: Coke Company	274
DX 42—	Report to shareholders, three months ended March 31, 1969, Zeigler: Coke Company	278
DX 43—	Report to shareholders, six months ended June 30, 1969, Zeigler: Coke Company	281
DX 44—	Report to shareholders, nine months ended September 30, 1969, Zeigler: Coke Company	284
DX 45—	Statement by Assistant Attorney General Richard W. McLaren to the Cabinet Task Force on Oil Imports, August 8, 1969	287
DX 46—	The Answers of Plaintiff to Interrogatories of Defendants 1(a)-1(g), 1(j), 6-8, 13-15, 17, 18, 20, 21, 23, 26, 27, 30, 37, 44-46, 50, 51 and 54	295
DX 47—	May 29, 1969 letter from John T. Cusack to Reuben L. Hedlund	302
DX 48—	December 15, 1954 letter by George P. Harrington, President, Chicago, Wilmington and Franklin Coal Company to its stockholders	340
DX 49a—	Subpoena Questionnaire form and related court orders	345
DX 49—	Producer data exhibits, mine characteristics	397
DX 50—	Producer data exhibits, comparison of leading producers with other producers	411
DX 51—	Producer data exhibits, coal characteristics by producing districts	419
DX 52—	Producer data exhibits, overburden of strip mines and depth of deep mines	447
DX 53—	Consumer data exhibits, boiler specifications	458
DX 54—	Consumer data exhibits, types of sales by producing districts	461
DX 55—	Consumer data exhibit, analysis of consumption and production of coal by freight rate districts	462

Defense Exhibits:—Continued		Page
DX 56—	Government questionnaire data analysis of consumption and production of coal by freight rate districts	481
DX 57—	1960 utility use of Illinois coal	506
DX 58—	Coal sold under contract	508
DX 59—	Analysis of potential and actual use of fuels other than coal by coal consuming facilities	509
DX 60—	UEC coal reserve data: (a) Summary, UEC coal reserves as of December 31, 1969; (b) United Electric Coal Company's lands and reserve coal, July 31, 1958 through December 31, 1969; (c) Memos on changes in reserve tonnage 1958 through 1969; (d) Potential acquisitions	517
DX 61—	Coal reserves of listed companies in Illinois, Indiana and Western Kentucky 1968	577
DX 62—	Types of coal reserves held by listed companies in Illinois, Indiana and Western Kentucky 1968	578
DX 63—	United Electric Coal Company's committed and uncommitted reserves—by mines	579
DX 66—	May 21, 1968 letter from Wisconsin Electric Power to John T. Cusack	580
DX 67—	Attachments dated February 12, 1968, February 13, 1968, and February 23, 1968 to letter of May 24, 1968 from Corn Products to John Cusack	582
DX 68—	August 15, 1968 letter from Thompson, Hine & Florey to John Cusack	587
DX 69—	September 17, 1968 letter from General Portland Cement to Ronald Futterman	588
DX 70—	September 29, 1969 letter from Mississippi River Corporation to Hugo Sims	590
DX 71—	May 27, 1968 letter from Hall, Patterson, Taylor, McNicol & Marett to John Cusack	591
DX 72—	May 20, 1968 leter from Inland Steel Company to John Cusack with two page attachment	594
DX 73—	November 28, 1966 letter from Vulcan Materials to John Cusack	599
DX 74—	September 11, 1968 letter from River Cement Company to Edwin M. Zimmerman	600
DX 75—	January 24, 1969 letter from Missouri Portland Cement Company to John Cusack	603
DX 76—	December 23, 1966 letter from Norman, Englehardt, Zimmerman, Frankie & Lauritzen to Bertram Long with attachment	604
DX 77—	October 21, 1966 letter from CILCO to Bertram Long	607
DX 78—	September 22, 1969 letter from Missouri Portland Cement Company to Hugo Sims	608
DX 80—	Certified copy of respondent's Exhibit No. 184A-F received in evidence in FTC Dkt. 8765 in the matter of Kennecott Copper Corporation	610

Defense Exhibits:—Continued		Page
DX 81—	1968 Annual Report of Standard Oil Company (New Jersey)	617
DX 82—	Plaintiff's proposed findings of fact 5a, 5b, 5b(2), 5d(4) and 5e(3), *United States* v. *Standard Oil Company* (New Jersey et al.), Civ. No. 954-64, D. N.J. (1964)	623
DX 83—	Plaintiff's memorandum accompanying plaintiff's proposed findings of fact and conclusions of law, *United States* v. *Standard Oil Company* (New Jersey, et al.), Civ. No. 954-64, D. N.J. (1964)	626
DX 84—	Final judgment in *United States* v. *Peabody Coal Company et al.*, Civ. No. 67 C 1621 (N.D. Ill. 1967)	640
DX 85—	"Interfuel Competition and Changes in the Coal Industry Since World War II," report and statistics by Dr. Bruce C. Netschert	647
DX 86—	"Structure and Geography of the Electric Utility Market for Coal," report and statistics by Abraham Gerber	733
DX 87—	Report on coal reserves and deep mining by Paul Weir Company	751
DX 88—	"Availability of Economically Mineable Strip Reserves Within the State of Illinois," report by John E. Organ, Geologist	796
DX 89—	"Impact of Sulphur Oxide Regulations on Midwest Coal Markets," report by Seversky, Environmental Dynamics Research Associates	798
DX 90—	1969 Annual Report of Commonwealth Edison	866
DX 91—	Letter of January 17, 1969 from Preston Kavanagh to Security Analysts	884
DX 92—	Letter of December 4, 1969 from Preston Kavanagh to Security Analysts	886
DX 93—	Commonwealth Edison: Profile of No. 1, *Nucleonics Week*, April 4, 11, 18 (1968)	889
DX 94—	1968 Annual Report of Commonwealth Edison	905
DX 95—	"Edison Seek A-site Downstate," *Chicago Daily News*, March 9, 1970	907
DX 96—	Advertisement entitled "Nuclear Power for Chicago," *Chicago Daily News*, March 13, 1967	908
DX 97—	Advertisement entitled "Commonwealth Edison Reports on Chicago's Air Pollution Problem," *Chicago Sun Times*, July 11, 1969	909
DX 98—	Advertisement entitled "Commonwealth Edison Reports on Progress Toward Cleaner Air," *Chicago Sun Times*, August 27, 1969	910
DX 99—	Advertisement entitled "No Smoke. No Dirt. No Fumes," *Chicago Tribune*, February 3, 1970	911

Defense Exhibits:—Continued		Page
DX 100—	Advertisement entitled "You're Looking at 20,000 Tons of Smokeless, Fumeless 'Coal'," *Chicago Tribune*, March 3, 1970	912
DX 101—	"Coal Strip Mining—Is It Reaching a Peak?" by Hubert E. Risser, Illinois Geological Survey (September 18, 1968)	913
DX 102—	Report of the National Fuels and Energy Study Group to the Committee on Interior and Insular Affairs, United States Senate, 87th Congress, 2d Session (1962)	921
DX 103—	Comparison of Coal-Fired and Nuclear Power Plants for the TVA System, June, 1966	996
DX 104—	Letter of October 17, 1962 from Elmer Hill to Barton Gebhart	998
DX 105—	Letter of October 18, 1962 from Barton Gebhart to Elmer C. Hill with two page attachment	999
DX 107—	*Central Station Nuclear Plants*, AEC Division of Industrial Participation, March 30, 1970	1003
DX 108—	AEC Release N-2, January 13, 1970, re Status Report on U.S. Civilian Nuclear Power Plants	1008
DX 110—	Chart entitled "U.S. Utility Orders for Electric Generating Equipment"	1011
DX 111—	Letters of February 19 and 22, 1968 from Richard P. Ryan, General Counsel, Humble Oil and Refining Company to John T. Cusack	1012
DX 112—	Excerpt from Minutes of Meeting of Board of Directors of General Dynamics Corporation on September 30, 1966	1015
DX 113—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies on October 9, 1959, May 13, 1960, July 15, 1960, September 9, 1960, October 28, 1960, March 10, 1961, May 12, 1961, September 8, 1961, May 18, 1962, July 13, 1962, March 8, 1963, September 13, 1963, May 8, 1964, and August 12, 1966	1022
DX 114—	Proxy statement of The United Electric Coal Companies 1954, 1955, 1956, 1957, 1958, 1959, 1960	1041
DX 116—	Nuclear Power Briefing For The Coal Industry, September 29-30, 1966. USAEC	1042
DX 136—	Advertisement entitled "Caution: Commonwealth Edison is Hazardous to your Health", *Chicago Sun Times*, July 8, 1969	1085
DX 137—	Advertisement entitled "Before everyone runs out of breath talking about pollution, we're doing something to clear the air," *Chicago Sun Times*, December 12, 1969	1086
DX 138—	1969 Steam-Electric Plant Factor	1087

Defense Exhibits:—Continued	Page
DX 144— Map entitled "Investor-Owned Electric Utility Service Areas"	1098
DX 145— Map entitled "Service Area, Dairyland Power Cooperative"	1099
DX 146— 1966 Annual Report, Union Electric Company	1100
DX 147— 1967 Annual Report, Union Electric Company	1102
DX 148— 1968 Annual Report, Union Electric Company	1103
DX 149— 1968 Annual Report, Northern States Power Company	1104
DX 150— "Fuels and Fuel Transport for Electric Energy," chapter 3 of "National Power Survey," a report by the Federal Power Commission (1964)	1107
DX 151— Article entitled "Chicago's Dirty Air—A Growing Peril," *Chicago Sun Times*, October 19, 1967	1120
DX 152— Article entitled "Antipollution, Antitrust Bills Are Signed by Gov. Ogilvie," *Chicago Sun Times*, June 26, 1969	1122
DX 153— Article entitled "Crackdown on Air Pollution!" *Chicago Sun Times*, July 14, 1969	1123
DX 154— Article entitled "Edison Cuts Use Of Coal, Reduces Air Pollution," *Chicago Sun Times*, November 11, 1969	1124
DX 155— Article entitled "8 Utilities Face Pollution Probe," *Chicago Sun Times*, November 13, 1969	1127
DX 156— Article entitled "Clean-Air Edicts Offered In Council; Dimout Suggested," *Chicago Sun Times*, November 18, 1969	1130
DX 157— Article entitled "Mikva Bill Would Make Air Pollution A Federal Offense," *Chicago Sun Times*, November 20, 1969	1134
DX 158— Article entitled "Pollution Fight—Edison Tells Coal Doubts," *Chicago Daily News*, December 1, 1969	1136
DX 159— Article entitled "'Black Diamond' Boom: Kleenburn Coal Mines Enjoy Demand Surge," *The Wall Street Journal*, January 7, 1970	1137
DX 160— Article entitled "Business Bulletin—A Special Background Report On Trends In Industry And Finance," *The Wall Street Journal*, March 19, 1970	1138
DX 161— Letter entitled "The News That Nobody Prints," *Mid-West Coal Producers Institute, Inc.*	1139
DX 162— Article entitled "New Ruckus On Foreign-Oil Imports To Pin Nixon Between Pollution Issue, Coal Groups," *The Wall Street Journal*, March 5, 1970	1141

Defense Exhibits:—Continued		Page
DX 163—	Article entitled "Commonwealth Edison Is Allowed To Import Low-Sulphur Fuel Oil—Hickel Says One-Year License Doesn't Establish New Policy; Coal Industry Fought Action," *The Wall Street Journal*, March 26, 1970	1143
DX 164—	Article entitled "The Real Meaning Of Alaskan Oil Finds," *U.S. News & World Report*, March 3, 1969	1144
DX 165—	Article entitled "Petroleum Prize—Oil Firms At North Slope Race For Data As Giant Lease Sale Bidding Approaches," *The Wall Street Journal*, May 2, 1969	1146
DX 166—	Article entitled "Jersey Standard Unit To Send Oil Tanker Through Northwest Passage In Test Run," *The Wall Street Journal*, June 4, 1969	1148
DX 167—	Article entitled "Three Oil Companies To Study Feasibility Of Building First Coast-To-Coast Pipeline," *The Wall Street Journal*, July 24, 1969	1149
DX 168—	Article entitled "Northern Natural Gas Plans Major Canada Pipeline—Cost Of System To Transport Canadian Gas To The U.S. Put At About $1.4 Billion—Government Approval Needed," *The Wall Street Journal*, April 1, 1969	1150
DX 169—	Article entitled "People Gas Unit Plans To Buy Midwest Area's First Gas From Canada," *The Wall Street Journal*, June 18, 1969	1151
DX 170—	Article entitled "Alberta Agency Backs Northern Natural On Bid To Export Gas To U.S. Midwest," *The Wall Street Journal*, December 17, 1969	1152
DX 171—	Article entitled "Consumers Power Announces Plans For Atomic Plant—Dow Chemical Will Be Chief Customer Of New Facility; Cost Put At $267 Million—Completion Is Slated In 1975," *The Wall Street Journal*, December 15, 1967	1153
DX 172—	Article entitled "Jersey Standard Joins List Of Companies To Make Nuclear Fuel—Subsidiary To Build Plant In 1970 In Washington State; Research Assigned To Battelle Institute," *The Wall Street Journal*, March 20, 1969	1154
DX 173—	Article entitled "In 1970: 23 Utilities Will Ask Bids On 29 Nuclear Units," *Nucleonics Week*, January 15, 1970	1155
DX 174—	Article entitled "The Anti-Atom Nuts," *Chicago Tribune*, January 20, 1970	1156
DX 175—	Article entitled "Consumers Power Announces Plans For New Plant—Pumped Storage Facility Set For 1973: Detroit Edison To Share Cost And Output—Outlay To Total $186 Million," *The Wall Street Journal*, November 28, 1967	1157

Defense Exhibits:—Continued Page

DX 176— Article entitled "FPC Aide Again Approves Con Edison Bid To Build Power Project; Protests Likely," *The Wall Street Journal*, August 7, 1968 ____ 1158

DX 177— Article entitled "TVA Plans To Start $155 Million Project At Raccoon Mountain—Plan Will Include 4 Reversible Pump-Turbine Units With Total Capacity Of 1.4 Million Kilowatts," *The Wall Street Journal*, January 19, 1970 ____ 1159

DX 178— Article entitled "Geophysics," *Time Magazine*, July 26, 1968 ____ 1160

DX 179— Article entitled "Earth's Own Power Source," *Chicago Daily News*, January 9, 1969 ____ 1161

DX 180— Article entitled "Burning Refuse To Be Used In 'Total Energy' Concept," *The Wall Street Journal*, June 23, 1969 ____ 1162

DX 181— Excerpt from transcript of Hearings before the Joint Committee on Atomic Energy, 99th Congress, 2d Session, on Participation by Small Electrical Utilities in Nuclear Power.—(Part 1-April 30-May 3, 1968), "Affiliation Is Fast Becoming A Necessity." ____ 1163

DX 182— Article entitled "New England Affiliation Slated —Utiilty Concerns Plan Affiliation," *New York Times*, June 12, 1968 ____ 1164

DX 183— Article entitled "Boards of Iowa P&L And Iowa-Illinois G&E Approve Merger Plan—New Entity, Iowa Energy Corp., Plans To Retire The 2 Utilities' Outstanding Preferred Shares," *The Wall Street Journal*, July 22, 1969 ____ 1165

DX 184— Article entitled "Ayrshire Collieries Asks Bids of 5 Firms—Coal Concern Invites Offers To Purchase Or Merge With It; Replies Expected Next Month," *The Wall Street Journal*, November 27, 1968 ____ 1166

DX 185— Article entitled "Ashland Oil Plans To Buy Or Lease Ayrshire Assets—Boards Vote Proposal That Includes The Sale Of Coal Royalties To Third Firm—Pact Involves $125 Million," *The Wall Street Journal*, January 22, 1969 ____ 1167

DX 186— Article entitled "Metal Climax, Ayrshire Sign Merger Accord—Acquisition Of Coal Producer By Metals Firm Valued At Minimum Of $62.6 Million—Boards And Holders To Vote," *The Wall Street Journal*, April 24, 1969 ____ 1168

Defense Exhibits:—Continued		Page
DX 187—	Advertisement entitled "Air Pollution Authorities Urge Use Of 'Clean-Burning' Natural Gas—Today, More and More Apartment Building Owners Are Turning To Gas Heat. Things Stay Cleaner Inside And Out," *Chicago Sun Times*, May 16, 1967	1169
DX 188—	Advertisement entitled "1977 The Year Our City Died." *Philadelphia Inquirer*, December 4, 1967	1170
DX 189—	Advertisement entitled "You Can Heat 2½ Houses With Modern Oil For What It Costs To Heat 1 House With Electricity!"	1171
DX 190—	Advertisement entitled "We're Helping Main Street Switch To Nuclear Power."	1172
DX 191—	Advertisement entitled "This Pollution Was Caused By Burning Money. How Much Of It Was Yours?" *Fortune*, March 1, 1968	1173
DX 192—	Advertisement entitled "What's Gas Energy Doing To Make Industry Nice To Be Near?" *American Gas Association, Inc.*	1174
DX 193—	Advertisement entitled "How Nuclear Science May Give America More Gas Energy." *American Gas Association, Inc.*	1175
DX 194—	Advertisement entitled "Boiler Conversion?"—"Get The 5 Advantages Gas Power-Type Burners Give You In Full Measure."—"Midco Converts An Apartment And The Service Staff Is Cut By 2/3." *American Gas Association, Inc.*	1176
DX 195—	Advertisement entitled "Who Offers You 24-Hour Plant Site Location Service On The 60-Mile Illinois Shore? Peoples Gas, Of Course." *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1177
DX 196—	Advertisement entitled "The Not-So-Brief Case For Complete Chicagoland Plant Site Information," *The Peoples Gas Light And Coke Company And North Shore Gas Company*	1178
DX 197—	Advertisement entitled "The Perfect Salt Substitute," *American Natural Gas Company*	1179
DX 198—	Advertisement entitled "St. Louis' Tallest Office Building Will Be Total Energy All The Way," *The Wall Street Journal*, May 13, 1969	1180
DX 199—	Advertisement entitled "The Savings And Loan That Saves With Natural Gas," *American Gas Association, Inc.*	1181
DX 200—	Advertisement entitled "Natural Gas Energy . . . The Electrifier—Pretty Soon You May Be Making Your Own Electricity From Natural Gas."	1182

Defense Exhibits:—Continued Page

DX 201— Advertisement entitled "What Do You Call It? No Matter What You Call It There's A Lot More Coming From Natural Gas Energy—There's A *Lot* More Coming From Natural Gas Energy." *Northern Illinois Gas Company* ____ 1184

DX 202— Advertisement entitled "Another Shopping Center Finds That Making It's Own Electricity Is The Best Buy.—Waukesha Gas Energy Systems Produce Electricity For Lighting, Heating And Cooling." *American Gas Association, Inc.* ____ 1187

DX 203— Advertisement entitled "Sheraton-O'Hare Reduces Utility Costs Over 50%. Waukesha Gas Engines Produce Electricty, Cooling and Heating." *America Gas Association, Inc.* ____ 1188

DX 204— Advertisement entitled "Shoppers Buy All Year Round In An Ideal Climate Created With Gas Total Energy." *American Gas Association, Inc.* ____ 1189

DX 205— Advertisement entitled "School Board Chooses Gas Heat Over Electric And Saves Over $50,000. (That's Just On First Costs. So It's Just First Savings.)" *American Gas Association, Inc.* ____ 1190

DX 206— Advertisement entitled "This New School Uses Gas Energy For Heating, Cooling And Electric Power And Saves $1,000 a Month." *American Gas Association, Inc.* ____ 1191

DX 207— Advertisement entitled "Gas Produces All The Energy This High School Needs (Including Electricity) At A Projected Savings of $11,639 A Year," *Fortune*, May 1968 ____ 1192

DX 208— Advertisement entitled "Williams Hardware Buys All Of Its Electricity From The Gas Company. And Saves $14,000 A Year In The Bargain," *Fortune*, November 1968 ____ 1194

DX 209— Advertisement entitled "Introducing The Gas Guitar—The Switch To Gas Total Energy Is On," *Fortune*, May 15, 1969 ____ 1196

DX 210— Advertisement entitled "Gas Air Conditioning Is Like A Car That's Better Than Good." *Northern Illinois Gas Company* ____ 1197

DX 211— Advertisement entitled "Turn On A Party With A Gas Grill And Gaslight—We Call It The Patio Pair . . . By Charmglow." ____ 1198

DX 212— Advertisement entitled "Now. The Gas Self-Cleaning Oven. For Builders Who Like To Build Sales. Period. It's The Biggest, Wildest, Most Exciting Gas Industry Promotion Ever. Period. The Theme Is: The Gas Self-Cleaning Oven For People Who Like To Cook. Period." *American Gas Association, Inc.* ____ 1199

Defense Exhibits:—Continued		Page
DX 213—	Advertisement entitled "Texas Gas Invites You To The Wireless House."	1200
DX 214—	Advertisement entitled "Here's The Story Of The Gas Fuel Cell. It's Electrifying." *American Gas Association, Inc.*	1201
DX 215—	"Nuclear Steam-Generation of Electricity: Its Implication for the Future of Coal Transport by Railway and Water," by John C. Spychalski, *ICC Practitioners' Journal*, (July-August, 1967)	1202
DX 216—	"The Story of Coal," *The Petroleum Situation* (October 27, 1969 and November 28, 1969)	1215
DX 218—	Chart entitled "The Prime Interest Rate, 1928-1968," *Chicago Daily News*, December 18, 1968	1223
DX 219—	Letter dated March 9, 1970 from V. H. Clark, Secretary-Treasurer, Electric Energy, Inc., to Reuben L. Hedlund	1224
DX 220—	Letter dated June 29, 1942 from Frank F. Kolbe to B. L. Slack	1225
DX 221—	Letter dated July 23, 1954 from Frank F. Kolbe to Herman G. Schenck	1226
DX 222—	Letter dated June 11, 1956 from Frank F. Kolbe to Nye F. Morehouse	1227
DX 223—	Brochure entitled "Taum Sauk, Union Electric's Pumped—Storage Hydro Plant."	1228
DX 224—	Press release, University of Chicago, January 19, 1970	1232
DX 225—	Letter dated May 25, 1960 from Ward B. Chamberlin, Jr., Office of Chief Counsel, General Dynamics Corporation to Robert A. Bicks, Acting Assistant Attorney General, Antitrust Division, Department of Justice and exhibit C thereto.	1233
DX 227—	November 1, 1963 Memorandum from R. H. Inman to R. J. Hepburn re Freeman analysis of Kerr Mine	1236
DX 228—	Excerpts from the Minutes of the Board of Directors of The United Electric Coal Companies of September, 1966, pages 4386-4389	1238
DX 229—	Form 250 Response to the Court-Ordered Subpoena Questionnaire for the Freeman Coal Mining Corporation	1242
DX 230—	April 13, 1970 letter from Mr. Allen Van Wyck, Chairman of the Board of Illinois Power Company, to Donald G. Kempf, Jr.	1244
DX 231—	April 14, 1970 letter from K. E. Bowen, President of Central Illinois Public Service Company, to Donald G. Kempf, Jr.	1245
DX 232—	Brochure entitled "Low Cost Electric Power and Dependability . . . Through MAPP"	1247
DX 233—	Brochure entitled "Mid-America Interpool Network—MAIN"	1249

Defense Exhibits:—Continued Page

DX 234— 1969 Annual Report of Illinois Power Company 1265

DX 235— Article entitled "Shortage of Low-Sulphur Coal Hampers Electric Utilities in Antipollution Efforts," *The Wall Street Journal*, April 6, 1970 1269

DX 236— April 1, 1970 letter from Marvin O. Young, Vice President and General Counsel for Peabody Coal Company, to Reuben L. Hedlund re coal reserves in McDonough, Schuyler, Adams, Brown and Hancock Counties (Illinois) 1273

DX 237— Series of four tables: (1) "Fraction of Total Illinois Production of Leading Companies Other Than Peabody"; (2) "Average Production Per Company"; (3) "Changes in Concentration in Illinois Coal Production Since 1959"; (4) "Changes in Concentration in Illinois, Indiana, and Western Kentucky Since 1959" 1274

DX 238— Telegram of March 5, 1970 from Stephen F. Dunn, President of the National Coal Association, to the President of the United States re foreign oil imports to Midwestern utilities 1278

DX 239— Summary entitled "Proposed Plans of Compliance With Chicago Air Pollution Control Ordinance of Those Facilities for Which a Response to Court-Ordered Subpoena Questionnaire was Received" 1279

DX 240— Excerpts from the Keystone Coal Buyer's Manual from the years 1961, 1963, and 1964 1282

DX 241— Excerpt from the 1968 Annual Coal, Oil and Gas report of the Illinois Department of Mines and Minerals 1289

DX 242— Letter to Department of Justice, Chicago, Illinois from R. E. Hartmann, Alpha Portland Cement Company, dated January 22, 1969 1291

DX 243— Letter to John T. Cusack from Robert H. Gorske, General Counsel, Wisconsin Electric Power Company, dated May 21, 1968 1293

DX 252— Letter to Mr. Reuben L. Hedlund from Clayton G. Ball, Chairman of the Board, Paul Weir Company, dated June 8, 1970 1295

DX 254— "Abatement of Sulfur Oxide Emissions From Stationary Combustion Sources" prepared by *Ad Hoc* Panel on Control of Sulfur Dioxide from Stationary Combustion Sources, Committee on Air Quality Management Committees on Pollution Abatement and Control, Division of Engineering, National Research Council, 1970 1298

DX 257— West Central Region Power Survey 1970-1990, A Report to the Federal Power Commission prepared by The West Central Regional Advisory Committee 1381

Deposition Exhibits: Page

Abrahamson Deposition Exhibit 1—Front Cover of 1967 Annual Report of Wisconsin Power & Light Company 1409
Abrahamson Deposition Exhibit 1A—Back page of 1967 Annual Report of Wisconsin Power & Light Company 1410
Beck Deposition Exhibit 1—Letter to Antitrust Division, Department of Justice, Chicago, Illinois, from C. V. Beck dated November 14, 1968 1411
Brazzale Deposition Exhibit 1—Document entitled "Heating Fuel Economic Analysis" for the Federal Office Building and United States Courthouse, Chicago, Illinois 1412
Burton Deposition Exhibit 1—Document entitled "Solicitation, Offer, and Award Contract GS-05S-4945" issued August 1, 1967 1413
Camicia Deposition Exhibit 1—Keystone's Map of the Coal Fields of the United States 1415
Gallagher Deposition Exhibit 3—Mineral Industry Surveys, Bituminous Coal and Lignite Distribution, Calendar Year 1967 1416
Griswold Deposition Exhibit 3—Report of the Secretary of Health, Education, and Welfare to the Congress of the United States entitled "Air Pollution by Federal Facilities" and dated January 1968 1456
Griswold Deposition Exhibit 4—Second Report of the Secretary of Health, Education, and Welfare to the United States Congress entitled "Air Pollution Abatement by Federal Facilities" and dated January 1969 1470
Griswold Deposition Exhibit 5—Document entitled "Operating Experience with Wet-Dolomite Scrubbing" by J. F. McLaughlin, Executive Assistant, Union Electric Co., St. Louis, Missouri, and J. Jonakin, Products Manager, Air Pollution Control Systems, Combustion Engineering, Inc., Windsor, Connecticut, presented at the Air Pollution Control Association Annual Meeting in New York City on June 22-26, 1969 1502
Jensen Deposition Exhibit 12—Memorandum from Burl C. Jensen to Mr. R. H. Inman dated June 7, 1965 1519
Jensen Deposition Exhibit 13—Memorandum from D. H. Emling and B. C. Jensen to Mr. R. H. Inman dated June 7, 1966 1521
Kolbe Deposition Exhibit 2—Annual Report of The United Electric Coal Companies 1956 1526
Kolbe Deposition Exhibit 4—Annual Report of The United Electric Coal Companies 1958 1530
Kolbe Deposition Exhibit 7—Annual Report of The United Electric Coal Companies 1961 1532
Kolbe Deposition Exhibit 12—Letter to Mr. W. B. Hillery, unsigned, by the President dated February 27, 1957 1533

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit 13—Memorandum from T. H. Latimer to Mr. F. F. Kolbe dated February 18, 1957 ... 1534
Kolbe Deposition Exhibit 14—Letter from Frank Kolbe to Frank Nugent dated August 18, 1958 ... 1536
Kolbe Deposition Exhibit 15—Letter from Frank Nugent to Frank Kolbe dated August 20, 1958 ... 1537
Kolbe Deposition Exhibit 16—Profitability comparison between UEC and other coal mining companies (1959) ... 1538
Kolbe Deposition Exhibit 17—Memorandum from R. H. Inman to Mr. Frank F. Kolbe dated November 21, 1957 ... 1541
Kolbe Deposition Exhibit 33—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated May 10, 1961 ... 1542
Kolbe Deposition Exhibit 42—Annual Report of The United Electric Coal Companies 1939 ... 1545
Kolbe Deposition Exhibit 51—Annual Report of The United Electric Coal Companies 1948 ... 1547
Kolbe Deposition Exhibit 57—Annual Report of The United Electric Coal Companies 1954 ... 1548
Kolbe Deposition Exhibit 59—Paul Weir Company Valuation of Physical Assets of UEC as of December 31, 1959 ... 1549
Kolbe Deposition Exhibit 60—Document entitled "Regarding Need For Additional Stripping Equipment at Fidelity Mine" dated June 17, 1966 and signed by J. M. Morris ... 1562
Kolbe Deposition Exhibit 61—Contract and agreement between Alcoa and UEC dated September 5, 1956 ... 1565
Kolbe Deposition Exhibit A—Comparison between Truax-Traer Coal Company and The United Electric Coal Companies ... 1571
Kolbe Deposition Exhibit E—Notebook entitled "Report on Proposed Merged Illinois Operations, Truax-Traer Coal Company, January, 1956" of Theron G. Gerow, Mining Consultant and Engineer ... 1587
Kolbe Deposition Exhibit L—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent ... 1628
Kolbe Deposition Exhibit N—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated October 3, 1955 ... 1629
Kolbe Deposition Exhibit O—Memorandum to Mr. R. J. Hepburn from T. H. Latimer dated February 16, 1960 ... 1631
Kolbe Deposition Exhibit S—United States Letters Patent No. 2,325,064, dated July 27, 1943, entitled "Explosive Composition, Robert W. Lawrence, Wilmington, Delaware, assignor to Hercules Powder Company, Wilmington, Delaware, a corporation of Delaware" ... 1634
Kolbe Deposition Exhibit T—Letter from Mr. LeRoy Keane, Assistant General Manager of Hercules Powder Company, to The United Electric Coal Companies dated June 27, 1956 ... 1637
Kolbe Deposition Exhibit W-1—Letter from Frank Kolbe to Harry LaViers dated February 25, 1958 ... 1639

Deposition Exhibits:—Continued Page

Kolbe Deposition Exhibit W-2—Letter from Harry LaViers to Frank Kolbe dated March 6, 1958 ... 1640
Kolbe Deposition Exhibit W-3—Letter from Harry LaViers to Frank Kolbe dated April 28, 1958 ... 1641
Kolbe Deposition Exhibit X—Memorandum to Robert J. Hepburn from "President" dated December 3, 1957 ... 1642
Kolbe Deposition Exhibit X-1—Letter from R. J. Hepburn to Frank Kolbe dated November 29, 1957 ... 1642
Kolbe Deposition Exhibit X-2—Memorandum from T. H. Latimer to R. J. Hepburn dated November 25, 1957 ... 1643
Kolbe Deposition Exhibit Y—Memorandum from T. H. Latimer to R. J. Hepburn dated November 7, 1955 ... 1646
Kurtz Deposition Exhibit 8—Steam-Electric Plant Factors, 1968 Edition ... 1650
Kurtz Deposition Exhibit 9—Bituminous Coal Facts 1966 ... 1656
Kurtz Deposition Exhibit 10—Bituminous Coal Facts 1968 ... 1657
Latimer Deposition Exhibit 25—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated September 25, 1964 ... 1662
Latimer Deposition Exhibit 38—Memorandum from T. H. Latimer to Mr. R. H. Inman dated July 19, 1966 ... 1664
Latimer Deposition Exhibit 48—Memorandum from T. H. Latimer to Mr. R. J. Hepburn dated February 10, 1961 ... 1665
Maguire Deposition Exhibit 1—General Dynamics Proxy Statement and Agreement and Plan of Merger with respect to Material Service Corporation dated November 24, 1959 ... 1666
Maguire Deposition Exhibit 35—Excerpt from the Minutes of the Board of Directors of General Dynamics Corporation on September 30, 1966 ... 1669
Middleton Deposition Exhibit 4—Control Techniques For Particulate Air Pollutants, United States Department of Health, Education and Welfare ... 1676
Morris Deposition Exhibit 3—Memorandum dated December 17, 1959 from R. J. Hepburn to Mr. J. M. Morris ... 1678
Morris Deposition Exhibit 4—Letter from Mr. John M. Morris to Mr. Frank Nugent dated January 10, 1966 ... 1680
Morris Deposition Exhibit 5—Letter from J. M. Morris to Mr. Frank Nugent dated March 14, 1966 ... 1682
Morris Deposition Exhibit 14—Letter dated May 3, 1965 from J. M. Morris to Mr. Frank Nugent ... 1683
Morris Deposition Exhibit 31—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated January 24, 1961 ... 1686
Morris Deposition Exhibit 32—Memorandum from R. J. Hepburn to Mr. T. J. Tarzy and Mr. J. M. Morris dated February 24, 1960 ... 1688
Morris Deposition Exhibit 35—Memorandum from R. J. Hepburn to Mr. J. M. Morris dated July 17, 1962 ... 1689

Deposition Exhibits:—Continued Page

Morris Deposition Exhibit 38—Letter from Mr. R. J. Hepburn to Mr. John Davis dated February 3, 1960 1690
Morris Deposition Exhibit 42—Letter from Mr. J. M. Morris to Mr. Frank Nugent dated October 27, 1965 1691
Morris Deposition Exhibit 46—Memorandum from T. J. Tarzy to Mr. J. M. Morris dated February 14, 1961 1693
Morris Deposition Exhibit 47—Letter from T. H. Latimer to Mr. G. I. Grasty dated November 20, 1957 1694
Morris Deposition Exhibit 55—Letter from Mr. Frank Nugent to Mr. John Morris dated April 26, 1965 1695
Morris Deposition Exhibit 59—Letter from G. H. Utterback to Mr. Robert S. Overbeck dated November 29, 1962 1696
Morris Deposition Exhibit 60—Letter from Mr. R. S. Overbeck to Mr. G. H. Utterback dated December 13, 1962 1697
Morris Deposition Exhibit 61—Contract and Agreement between The United Electric Coal Companies and the Aluminum Company of America dated May 3, 1965 1699
Morris Deposition Exhibit 62—Letter dated September 12, 1960 from J. M. Morris to Mr. Frank Nugent 1712
Morris Deposition Exhibit 70—Letter from J. M. Morris to Mr. Francis Stanley Jordan dated June 11, 1962 1713
Morris Deposition Exhibit 76—Memorandum from T. J. Tarzy to Mr. J. M. Morris dated February 15, 1961 1714
Nix Deposition Exhibit 1—Document entitled "Term Contract Ordering Data for: FSC Group 91 Fuels, FSC Class 9110—Coal, Veterans Administration Facilities and Federal Public Buildings, within the states of Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin" for the effective period of the date of award through June 30, 1968 1715
Nugent Deposition Exhibit 1—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1959 1741
Nugent Deposition Exhibit 2—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1960 1744
Nugent Deposition Exhibit 3—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1961 1747
Nugent Deposition Exhibit 4—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1962 1750
Nugent Deposition Exhibit 5—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1963 1753
Nugent Deposition Exhibit 6—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1964 1756

Deposition Exhibits:—Continued Page

Nugent Deposition Exhiibt 7—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1965 ... 1758

Nugent Deposition Exhibit 8—Financial Reports: Freeman Coal Mining Corporation; Year Ended December 31, 1966 ... 1760

Nugent Deposition Exhibit 9—Financial Reports: Freeman Coal Mining Corporaiton; Year Ended December 31, 1967 ... 1762

Nugent Deposition Exhibit 11—Annual Report of the Chicago, Wilmington and Franklin Coal Company for the Year 1953 ... 1764

Nugent Deposition Exhibit 16—Advertisement of Freeman Coal Mining Corporation in 1967 Keystone Coal Buyers Manual ... 1766

Nugent Deposition Exhibit 17—Advertisement of The United Electric Coal Companies in the 1967 Keystone Coal Buyers Manual ... 1768

Nugent Deposition Exhibit 19—Advertisement of The United Electric Coal Companies in the 1968 Keystone Coal Buyers Manual ... 1770

Nugent Deposition Exhibit 20—Advertisement of The United Electric Coal Companies in February 1968 issue of *The Black Diamond* ... 1772

Nugent Deposition Exhibit 22—Letter dated February 13, 1968 from Reuben L. Hedlund to John T. Cusack re Dividends Paid to MSC, Freeman, GD on the Stock of UEC, January 1, 1959 to December 27, 1967 ... 1774

Nugent Deposition Exhibit 29—Annual Report of The United Electric Coal Companies 1964 ... 1776

Nugent Deposition Exhibit 35—Invitation for Tenders of Common Stock of The United Electric Coal Companies by General Dynamics Corporation dated October 5, 1966 ... 1786

Nugent Deposition Exhibit 38—Map entitled "Shipping Coal Mines In Illinois" prepared by Jack A. Simon, State of Illinois, Department of Registration and Education, State Geological Survey, dated January 1, 1966 ... 1793

Nugent Deposition Exhibit 39—Letter from Tom Tarry to Frank Nugent dated December 11, 1964 and Chart Showing Midwestern Coal Consumption by Utility Plants, 1963 ... 1794

Nugent Deposition Exhibit 49—Minutes of The United Electric Coal Companies Board of Directors Meeting held October 28, 1960 re Capital Appropriation for UEC ... 1796

Nugent Deposition Exhibit A—Letter from Frank Kolbe to Henry Crown dated October 9, 1956 ... 1797

Deposition Exhibits:—Continued Page

Pedersen Deposition Exhibit 5—United Electric Coal Companies Computation of Provision for Federal Income Taxes, Month of October 1966 and Ten Months Ended October 31, 1966 ____ 1800
Redard Deposition Exhibit 1—Keystone Steel and Wire Company letter to Department of Justice dated April 26, 1968 ____ 1808
Simon Deposition Exhibit 1—Simon, J.A., An Evaluation of Illinois Coal Reserve Estimates, 1968 ____ 1810
Sloane Deposition Exhibit 1—Unsigned letter from the Secretary of the United Coal Companies to Mr. Robert S. Overbeck dated January 21, 1963 ____ 1821
Steiner Deposition Exhibit 1—VITA, Peter O. Steiner dated August, 1969 ____ 1823
Steiner Deposition Exhibit 2—*U.S.* v. *General Dynamics, et al.*, Memorandum of Expected Testimony of Peter O. Steiner, Professor of Economics and Law, University of Michigan dated August 14, 1969 ____ 1828
Terleke Deposition Exhibit 2—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1957-1958 ____ 1837
Terleke Deposition Exhibit 11—Mid-West Coal Producers Institute, Inc. Report of Mine Performance, 1966-1967 ____ 1841
Weir Deposition Exhibit 1—Shipping Coal Mines (Map), Illinois, Indiana, West Kentucky. ____ 1845
Weir Deposition Exhibit 8—Memorandum from R. H. Inman to Mr. R. J. Hepburn dated August 5, 1959 ____ 1846
Weir Deposition Exhibit 19—Brochure entitled "Paul Weir Company" ____ 1847

INDEX

WEST CENTRAL REGION

POWER SURVEY

1970–1990

A REPORT

to the FEDERAL POWER COMMISSION

prepared by

THE WEST CENTRAL
REGIONAL ADVISORY COMMITTEE

SUMMARY

The West Central Region comprises about one-fifth of the conterminous United States and includes about 14% of the population. The region is outlined on the map, Figure 1, below.

Figure 1

The region extends from Lake Michigan and the Illinois-Indiana state line on the east to an irregular line through eastern Montana, Wyoming and western Nebraska. In the north-south direction, the area extends from the Canadian border to an irregular mid-continent line including most of Nebraska, northern Missouri and all of Illinois. The West Central Region corresponds to FPC power supply areas 13, 14, 15, 16, 17 (excluding the Kansas City area), 26, 27, 28 and 40.

The principal load centers are located in the eastern half of the region, and are concentrated in the metropolitan areas of Chicago, Milwaukee, Minneapolis-St. Paul, Omaha, Des Moines, Quad Cities and St. Louis. The western portion of the region is an area of low population density and corresponding low load requirements with few major load centers.

The non-coincident peak load for 1965 in the West Central Region was 24,290 megawatts and the projections are 35,930 megawatts for 1970, 70,610 megawatts for 1980, and 131,680 megawatts for 1990 as detailed in the following tabulation. This indicates a load in 1990 of about five and one-half times the 1965 load compared to an anticipated population growth of 40 percent. The total energy used per person is expected to increase from 4,800 kwhr in 1965 to 18,500 kwhr in 1990.

Figure 2
LOAD GROWTH IN THE WEST CENTRAL REGION
(MEGAWATTS)

PSA Area	1965	1970	1980	1990
13	3,344 (W)	4,660 (W)	8,510 (S)	15,290 (S)
14	6,733 (S)	10,070 (S)	19,810 (S)	37,020 (S)
15	2,943 (S)	4,530 (S)	9,720 (S)	18,770 (S)
16	2,984 (W)	4,280 (S)	9,210 (S)	18,350 (S)
17	2,471 (S)	3,730 (S)	7,160 (S)	13,120 (S)
26	649 (W)	960 (W)	1,820 (W)	3,390 (W)
27	627 (W)	910 (W)	1,900 (W)	3,680 (W)
28	1,444 (S)	2,220 (S)	4,390 (S)	8,070 (S)
40 (Excl. EEInc)	2,529 (S)	3,835 (S)	7,355 (S)	13,255 (S)
40 (EEInc only)	566 (W)	735 (W)	735 (S)	735 (S)
Total (Non-coincidental)	24,290	35,930	70,610	131,680
Total (Non-coincidental summer season)	23,920	34,830	69,780	130,240

(S) denotes summer peak
(W) denotes winter peak

The task force based these load projections on a pooling of the independent judgments of the utilities in the region. This current forecast for the region as a whole is higher than that appearing in

the 1964 National Power Survey. As an example, the 1980 forecast of 70,610 mw compares with the previous forecast of 61,050 mw, an increase of about 15%. The principal reason for this increase is the continued rapid growth in the economy and growth in utility sales and peak loads during the period subsequent to the 1964 National Power Survey effort.

Substantial fossil fuel resources are located within the region, with approximately 370 billion tons of recoverable coal reserves believed to exist. Additionally, a recent report indicated additional reserves could amount to 225 billion tons of recoverable coal reserves in unmapped and unexplored areas. Although the bituminous coal resources have made a considerable contribution to the supply of electric energy to date, the sub-bituminous coal supply in Montana and Wyoming and the lignite coal reserves in the Dakotas and Montana are receiving new attention with the advent of unit-train transportation and improved burning technology. As a matter of interest, one county in North Dakota contains 71 billion tons of lignite coal. This is the largest tonnage for coal bearing counties in the nation.

The natural gas reserves in the region comprise less than 1% of the total reserves in the United States. The crude oil and natural gas liquid reserves approximate 2% of the total liquid hydro carbon reserves in the United States.

The fossil fuel survey indicated that the average price of coal f.o.b. mine has increased about 10% for coal obtained from Illinois, the highest producing coal area in the region, during the period 1961-1966. Rail transportation has predominated in the movement of coal in this region, and within recent years the cost of coal transported by rail has been reduced substantially on selected movements of coal shipped by unit train. During 1966 about 22% of coal for the region was shipped by unit train, 27% by rail-barge, and 11% by rail-lake.

Large investor-owned utilities are the principal suppliers of electric energy to the major metropolitan centers in the eastern portion of the region. Rural electric cooperatives are well established throughout the entire region and the generation-transmission type (G & T) cooperatives are functioning in Iowa, Minnesota, North Dakota, South Dakota and Wisconsin. Public agencies are the principal suppliers of electric energy in Nebraska. The largest numbers of municipal systems in the region are found in PSA 17 (188), PSA 28 (138), and PSA 16 (110).

In the West Central Region there are 85 investor-owned systems, 261 cooperatives, two Federally-owned systems, and 701 publicly owned systems, comprised mainly of municipal systems and public power districts. Investor-owned companies serve 83.8 percent of the energy requirements in the region, the cooperatives 2.6 percent and the public agencies (other than Federal) 6.9 percent. The Federal Government generates 6.7 percent of the electric energy in the region, its output being sold principally to municipalities, public power districts and cooperatives. In 1965 about 38 percent of all the power generated by G & T cooperatives in the United States was produced in the West Central Region with cooperatives in PSA 16 alone accounting for about one-half of this amount.

The five largest of the 85 investor-owned electric systems supply nearly 60 percent of the electric loads in the region. Commonwealth Edison Company of Chicago alone accounts for about 27 percent and Union Electric Company of St Louis for about 11 percent of the regional load. The largest municipal system in the region is Springfield, Illinois, which had a peak load in 1967 of 170 megawatts or about one-half percent of the total regional load.

Public power districts are the principal suppliers of electric power in Nebraska. Many towns in the state are served by municipal systems. Some of the municipalities provide their own generation but most obtain their power from public power districts which carry out the principal generation and transmission functions in the state. Public power districts and cooperatives in Nebraska are also the principal agencies for the distribution of power. There are no investor-owned utilities providing electric service in Nebraska.

The Bureau of Reclamation is the marketing agency for hydroelectric power from Federal projects located in the Missouri River Basin. The power is marketed largely to customers having preference under Federal Law, i.e., municipal systems, public power districts and cooperatives, over a transmission network which generally has a voltage of 230 kilovolts. Numerous wheeling arrangements have been made by the Bureau with utilities in the area for delivery of power to such preference customers.

There is a total of 1,049 electric systems serving the region. With the exception of 71 isolated systems comprising .57% of the total service, all the systems are interconnected and operate in parallel with the vast majority of electric utilities in the United States. By 1970, the interconnecting transmission system will be overlaid with a 345 kv transmission system in the eastern

half of the region and an overlaying EHV system in the western half will have been begun. The pattern of transmission development anticipates that the 345 kv system in the eastern half will be substantially augmented during the 1970-1980 period and a 765 kv system will have been started. In the western half of the region the transition to a 500 kv system will be initiated. By 1990, several east to west 765 kv transmission lines are anticipated with their extension through western Minnesota, the Dakotas and the state of Nebraska at 500 kv to interconnect with the western systems.

Consideration of probable increasing fossil fuel costs, increasing concern for air pollution, fossil fuel transportation difficulties, and the anticipation of relative decreasing nuclear fuel costs with the development of fast breeder reactors have resulted in a considerable emphasis on nuclear generating plants. Although about 90% of the electric energy produced in the region is presently supplied by fossil-fuel generation, by 1990 nuclear generating capacity is anticipated to comprise 57% of the region's capacity. Nuclear generation is expected to supply nearly 70% of the region's energy requirements by that time. While the quantity of coal burned annually is indicated to increase from 51 million tons in 1966 to 69 million tons in 1975, the regional use of coal apparently will remain relatively constant at about 65 million tons for the remainder of the study period.

Generating capacity of 79,832 megawatts is projected by 1980 to supply a non-coincident summer peak of 69,780 mw with a reserve of 15.6%. By 1990, generating capacity of 151,041 megawatts is projected to cover a non-coincident summer peak of 130,240 megawatts reflecting a reserve of 16.6%. An importation of 800 mw of hydro power from Canada is included in each of these reserve calculations. Additional reserve of an undetermined amount exists because of the diversity of load between utilities within the season. About half of the 1990 capacity is shown to be in units of 800 megawatts or larger. Generator unit size up to 2000 megawatts and total plant size up to 4000 megawatts are included.

There are six power pools within the region and three major regional coordinating groups. These organizations permit the coordination of planning of transmission and generation and the coordination of operating these facilities. Such coordination is made possible through the direct work of committees and task forces comprised of representatives of individual utilities on the pool level, and of representatives of pools and areas on the regional level. Two offices have been established to provide coordination of hour-to-hour and day-to day operations.

Additionally, liaison established with contiguous regions provides continuity in the development of interconnections at the boundaries of these organizations and in the operating of mutually-affected facilities. As further coordination develops in increasing depth, it is anticipated that a single regional coordinating organization will evolve with the major planning and operating responsibilities being carried on by five area-wide groups. The interworking between these five groups then will be coordinated within the one principal organization.

II

INVENTORY OF FOSSIL FUEL RESOURCES

INTRODUCTION

The purpose of this report is to update the 1964 National Power Survey, Vol. II, Advisory Committee Report No. 21 on Fuels for Electric Generation, prepared by the Fuels Special Technical Committee.

In updating Report No. 21 we have not attempted to change or modify the extensive and authoritative background material in that report, which represents the best advance thinking on industry fuel problems by some of its foremost members. Instead we have supplemented that report where changes have occurred in the price of fuel, the cost of transportation and methods of transport.

The West Central Region fossil fuel reserves are reported in detail by individual counties in each state. The reserves are tabulated by class of reserves as to whether they are "measured," "indicated" or "inferred" and by thickness of the coal beds. Measured reserves are those for which tonnage was computed from direct measurements. Indicated reserves are those for which tonnage was computed partly from specific measurements and partly from responsible assumptions based on available data and geologic evidence. Inferred reserves are those for which quantitative estimates are based on a broad knowledge of the character of the bed or the region, but for which there are few, if any, actual measurements. This detailed information on coal reserves should be useful to system planners in selecting future sites for large thermal power plants.

Other task force committees have prepared reports on load projections, types of generation, air pollution and nuclear power; therefore, this report does not include information on those subjects. If the reader desires information on productive capacity of the coal industry, future projected prices of various fuels or other related information regarding fuels, it is suggested he consult the report of Fuel Resources, Requirements and Costs for Electric Generation in the Eastern United States which was prepared by a committee that included representatives from the Federal Power Commission, the Bureau of Mines and the Office of Oil and Gas, Department of the Interior.

SUMMARY

During the period 1970-1990, electric generation will be dependent upon five basic forms of energy -- coal, gas, oil, hydro, and nuclear. This report is concerned primarily with fossil fuels. The availability of approximately 370 billion tons of recoverable coal reserves in the West Central Region is more than sufficient to meet the electric utilities' requirements in this region through the year 2000. A recent report indicates additional reserves in this region could amount to 225 billion tons of recoverable coal reserves in unmapped and unexplored areas.[1] Coal, however, will be faced with continuing pressures from other forms of energy, and based on present trends the most significant competition will be from nuclear energy.

Mechanization and handling of coal at the mine will continue to improve. Some of the new developments in underground mining in recent years have been the use of a mobile bridge conveyor which has increased the productivity from a continuous miner substantially, the underground push button miner, the installation of long wall mining equipment, and the application of computer simulation techniques.

In determining the type of fuel to be used for electric generation a number of factors have to be reviewed and evaluated, each of which will have a bearing on total fuel costs for any one location. The cost of transportation, anti-air pollution devices, storing, handling and disposing of the fuel product are economic factors which can make a low cost fuel the most expensive fuel. Therefore, while a general picture can be drawn of the availability and price of fuels, the final determination in selecting a fuel or fuels for a particular plant must be based on the specific facts pertinent to that plant and its location.

A fossil fuel survey questionnaire was sent to twenty-six electric utilities which consume approximately 90 percent of the coal used for electric generation in the West Central Region. The questionnaire inquired as to producing district, tonnage burned, f.o.b. mine price, average BTU per lb. received, cents per million BTU f.o.b. mine, methods of transportation used, freight rate, haulage distance, and tonnage per shipment.

This survey indicated that in the period 1961-66 the average price of coal f.o.b. mine has increased from 15.03 to 16.57 cents per million BTU or an increase of 10.18 percent on the coal obtained

1. Averitt, Paul, 1968 U.S. Geological Survey.

in District 10 (36 million tons of 46 millions tons reported for the region).. The average annual increase in the cost of District 10 coal in the five year period 1961-1966 amounts to 1.9 percent per year. Due to the less significant tonnages reported in relationship to tonnage produced, a comparison of the price increases for coal obtained from other districts is not shown.

Rail transportation in the past has predominated in the movement of coal in this region, and within recent years the cost of coal transported by rail has been reduced substantially on selected movements of coal shipped by unit train. Based on the 46 million tons reported in the survey for the year 1966, approximately 10 million tons, or 21.8 percent, were shipped by unit train, 12,200,000 tons, or 26.6 percent, were shipped by rail-barge, and 5,280,000 tons, or 11.5 percent, were shipped by rail-lake. The amount of coal shipped by conveyor and captive shuttle train during the period 1970-1975 will increase by 11,000,000 tons versus a 7,000,000 ton increase for unit train shipments.

The average rail freight cost in the West Central Region for coal shipments in 1966 amounted to $1.97 per ton on a tonnage of 23,500,000 tons, or approximately 46 percent of the coal consumed in this region. The unit train freight rates reported in the survey when compared on a basis which considers railroad ownership of all equipment indicates that the mills per ton mile range from 10.3 mills per ton mile for an 85 mile haul to 7.2 mills for a 138 mile haul and down to 5.0 mills for a 355 mile haul.

Past projections indicated that unit train freight rates could level out at a cost of 4 mills per ton mile for hauls between 350 miles and 600 miles.[2] However, no hauls of 400 to 500 miles at 4 mills were reported. The inability of the utilities to obtain a lower cost than 5 mills per ton mile is partially substantiated by the fact that as of the present date between now and 1975 approximately 10,000 megawatts of nuclear capacity is planned or considered for installation in the West Central Region.

In the five year period 1961-1966 the consumption of gas for thermal electric generation increased from 0.223 to 0.260 trillion cubic feet or at an average annual rate of 3.11 percent compared to a 7.73 percent average annual increase in coal consumption in the same period. The average cost of gas for the region in the same period increased from 25 to 25.3 cents per million BTU or by 1.2 percent.

2. 1964 National Power Survey, Vol.2, Advisory Report No. 21, Pg. 338

Table A, page II-5, indicates the electric generation produced by coal fired plants in the West Central Region will increase from 124.8 billion Kwh in 1970 to 155.3 billion Kwh in 1990 and nuclear generation will increase from 17.5 billion Kwh to 489.1 billion Kwh in the same period. Table B, page II-5 indicates coal consumption will increase from 60.4 million tons in 1970 to 65.7 million tons in 1990.

Table 1, page II-11, lists the remaining coal reserves in the West Central Region by percent sulfur content and approximately 72.7 percent of the reserves in the region contain 1.0 percent or less sulfur. However, most of these low sulfur coal reserves are located in the States of Montana and North Dakota and most of the coal consumed in the region is obtained from the State of Illinois.

Table 2, page II-12, indicates the coal consumed for electric generation in the West Central Region in 1966 had an average sulfur content of 2.8 percent which is slightly more than the 2.3 percent average sulfur content of all coal consumed by the electric utilities in the United States.

The growing demand for air pollution abatement regulations has contributed to a major shift from the use of coal for electric generation to nuclear energy. In the West Central Region in 1966 approximately 72 percent of the electric generation was produced in coal fired plants and 1 percent by nuclear plants. Present projections illustrate that by 1990 approximately 22 percent of the electric generation in the region will be produced in coal fired plants and 70 percent by nuclear plants.

The natural gas reserves in the West Central Region as of December 31, 1966 amounted to 1.33 trillion cubic feet or less than one percent of the total reserves in the United States. Based on the projected United States cumulative natural gas requirements for the period 1966 to 1990 of 680 trillion cubic feet the reported reserves of this region could supply only 0.20 percent of these requirements.

The oil consumption in the West Central Region represented less than one percent of the total fuel consumption for the region. The crude oil and natural gas liquid reserves in the region amount to 0.813 billion barrels or approximately 2 percent of the total liquid hydrocarbon reserves in the United States.

In the State of Illinois as of July 1, 1965, the latest revised estimates of coal remaining in the ground totaled 140,700 million

Table A

West Central Region
Thermal Electric Generation by Type of Fuel and Hydro Generation
Year 1965-1990

	1965		1970		1975		1980		1985		1990	
	Billions kwh	%	Billions kwh	%	Billions kwh	%	Billions kwh	%	Billions kwh	%	Billions kwh	%
Thermal Generation												
Coal	99.9	72.2	136.8	67.2	144.3	55.1	149.4	38.6	134.2	30.4	130.3	22.2
Gas	23.9	17.3	30.6	15.1	35.6	13.5	34.1	9.2	27.8	7.4	29.5	5.0
Oil	.9	.7	1.1	.6	1.3	.5	1.5	.4	1.7	.3	2.0	.3
Nuclear	1.4	1.0	17.5	9.4	69.5	26.3	138.4	44.3	308.1	59.1	449.1	99.7
Total	136.1	91.3	171.4	93.4	250.1	95.1	250.6	96.3	441.8	97.2	685.9	97.8
Hydro Generation												
Conventional	12.1	8.8	12.1	6.6	12.8	4.9	13.6	3.7	14.2	3.0	15.5	2.3
Pumped Hydro	.1	-	.1	-	.1	-	.1	-	.1	-	.1	-
Total	12.2	8.8	12.2	6.6	12.9	4.9	13.7	3.7	14.4	3.0	15.6	2.2
Total Generation	138.3	100.0	183.6	100.0	263.0	100.0	270.3	100.0	456.2	100.0	701.5	100.0

Table B

West Central Region
Estimated Quantity of Coal, Oil and Gas Fuels Required for Electric Generation
and Millions of Tons of Coal Equivalent

	1965		1970		1975		1980		1985		1990	
	Quantity A	Equiv. Tons	Quantity A	Equiv. Tons	Quantity A	Equiv. Tons	Quantity A	Equiv. Tons	Quantity A	Equiv. Tons	Quantity A	Equiv. Tons
Electric Generation												
Coal	58.6	58.6	68.4	68.4	69.4	69.4	63.6	63.6	61.3	61.3	63.7	63.7
Gas	256.0	13.1	307.6	14.5	352.7	16.6	326.3	15.4	238.9	16.8	250.1	16.7
Oil	1.4	.5	1.9	.5	2.2	.6	2.4	.7	2.5	.7	3.0	.6
Nuclear	-	.7		6.5		12.0		70.7		127.0		307.0
Hydro		6.3		5.9		6.0		6.1		6.1		6.4
Total		79.1		89.8		125.5		149.5		213.1		394.8

Note: Fuel quantities are based on kilowatthour generation by fuels and weighted average heat rates, respectively, and were computed using the following conversion factors: 10,730 Btu per pound of coal; 143,000 Btu per gallon and 42 gallons per barrel of oil; 1,013 Btu per cubic foot of gas. The oil and gas equivalents per ton of coal are 3.33 barrels of oil and 21.3 MCF of gas, respectively. The amount of electric generation produced by coal thermal generation increases from 1975 to 1990 but fuel requirements decrease due to the improvement in the weighted average heat rate. Fuel consumption by type of fuel in the West Central Region will vary from the quantities indicated for the period 1970-1990 based on the future level of the national economy, industrial growth in the region, air pollution abatement regulations, fuel transportation cost, the price relationship of various fuels, regulatory restrictions, and the quantities of energy interchanged with other regions.

Footnote A
Fuel quantities in millions of tons of coal, barrels of oil and MCF of gas.

tons in reserves, of which 63,900 million tons are classed as measured and indicated and 76,800 million tons as inferred, all of which is of bituminous rank. The reserves are well distributed over an area of 38,000 square miles or 67 percent of the State's area in 78 counties of the 102 counties in Illinois. The minimum thickness of coal considered in preparing this estimate was 28 inches, except for areas of strippable coal where an average thickness of 18 inches was used.

Coal seams in Illinois are at depths ranging from a few feet to several hundred feet below the surface. Ages ago, the coal bearing formations were downfolded into a huge spoon-shaped basin centered in the southeastern part of the State. As a result, the beds minable by underground methods lie at the center of the basin while along the outer rim in a total of 40 counties, approximately 19,000 million tons of strippable coal lie near enough to the surface to be recovered by strip mining.

Tonnage figures alone, however, cannot demonstrate the full importance of Illinois coal reserves. The thickness of the beds is also extremely important since this aspect has a bearing on mining methods and, therefore, productivity. Most of the remaining coal reserves are in coal beds thick enough to permit effective mechanical mining.

The estimated original coal reserves of Iowa total 7,236 million short tons, of which 3,500 million tons are classed as measured and indicated reserves and 3,735 million tons are classed as inferred. A total area of about 1,316,040 acres in 37 counties was included in the reserve calculations; an additional area of about 1,291,830 acres in 44 counties is indicated by the currently available information to be favorable for the presence of coal beds more than 14 inches thick. The total recorded coal production of Iowa through 1963 is about 356 million tons. Assuming that for each ton of coal produced another ton has been made unrecoverable, the remaining reserves of the State are about 6,524 million tons.

Past estimates of the coal resources of Iowa were highly generalized and were based solely on an assumed total area underlain by coal of potential economic interest and on an assumed average thickness of coal within that area. The estimate of Campbell and Parker (1909), the most frequently quoted, of 29,160 million tons included coal 14 inches or more thick in an area of 12,560 square miles. The present detailed estimate by Landis (1965) is smaller than the older generalized estimates and covers a much smaller area. This estimate of Iowa coal reserves is on a bed-by-bed

original reserve basis. The ratio is about one-fourth as much reserves in about one-sixth as much area.

About one-third of Missouri is underlain by bituminous coal-bearing strata, and coal has been mined in 55 of the 63 counties in which it occurs. Coal deposits occur in an area of some 24,000 square miles extending northeastward across the State from Jasper County to Clark County. The estimated original coal reserves of Missouri total 23,977 million tons.

In the years since the Hinds (1912) estimate of 79,393 million tons was made, stratigraphic studies have indicated that many of his correlations of coal beds were in error and that the persistence in thickness which he assumed cannot be demonstrated in many localities. Coal beds thin and thicken from one area to another and in many instances in very short distances. An additional factor of considerable importance in the area north of the Missouri River is that glacial drift occupies the position of coal beds in many places. Details of this relationship can be established only by drilling or mining but, in general, considerable areas are affected.

A re-evaluation of Missouri's original (before mining) coal resources was made by Searight (1966) on a county-by-county basis. Current information does not support the large resources indicated by Hinds, and these have consequently been adjusted downward. In some cases, only 10 percent of the previous estimate has been retained, and others have been cut to as little as one percent of the earlier estimate. The total tonnage represented in the present estimate of 23,977 million tons is less than one-third that of 1912 estimate figures. The total cumulative tonnage mined in the period 1840 through 1967 has been approximately 313 million tons. The coal remaining is, therefore, estimated to be approximately 23,335 million tons.

The original coal reserves of Montana total 222,047 million tons as estimated by Combo and others (1949). This estimate includes 2,363 million tons of bituminous coal, 132,151 million tons of subbituminous coal, and 87,533 million tons of lignite. The reserves were estimated according to standard procedures of the U.S. Geological Survey with several minor exceptions as follows: for bituminous coal the thickness categories used were 14 to 24 inches, 24 to 36 inches, and more than 36 inches, instead of the standard categories of 14 to 28 inches, 28 to 42 inches, and more than 42 inches, which were established after the Montana work was underway. For subbituminous coal and lignite standard categories of 2½ to 5 feet, 5 to 10 feet, and more than 10 feet were used.

The Montana coal fields cover 35 percent of the total area of the State. Reserves are present in 35 out of 56 counties, but are concentrated largely in the Fort Union region and the Powder River Basin in the eastern part of the State. Big Horn, Powder River, and Rosebud Counties alone contain more than half the total in the State. For the past several years considerable exploration has been conducted by mining and petroleum companies and currently (April 1967) revised estimates indicate the presence of deposits of strippable reserves totaling about 8 billion tons.

The original lignite reserves of North Dakota, as estimated by Brant (1953), total 350,910 million tons of which 9,522 million tons are classed as measured, 50,120 million tons as indicated, and 291,268 million tons as inferred. The reserves were estimated according to the standard procedures of the U.S. Geological Survey. All the lignite included in the estimate is less than 1,200 feet below the surface and about 70 percent of the total reserves are less than 500 feet below the surface.

The reserves are well distributed over an area of 28,000 square miles in 23 counties in the western half of the State. Of several counties with large reserves, Dunn County is conspicuous in containing 71 billion tons or about one-fifth of the State total. This is also the record reserve tonnage for coal-bearing counties in the United States.

The original lignite reserves of South Dakota, as estimated by D. M. Brown (1952), total 2,033 million tons, all of which is less than 1,000 feet below the surface. The reserves were estimated according to standard procedures of the U.S. Geological Survey. The lignite reserves are concentrated in six counties in the northwestern part of the State. Harding County contains nearly 84 percent of the estimated reserves, but most of past production has been obtained from Dewey and Perkins Counties.

INVENTORY OF FOSSIL FUEL RESOURCES

During the period 1970-1990, electric generation will be dependent upon five basic forms of energy -- coal, gas, oil, hydro, and nuclear. This report is concerned primarily with fossil fuels. The availability of approximately 370 billion tons of recoverable coal reserves in the West Central Region as shown in Figure 1 and listed in Table 1 are more than sufficient to meet the electric utilities' requirements through the year 2000. Coal, however, will be faced with continuing pressures from other forms of energy, and based on present trends the most significant competition will be from nuclear energy.

In determining the type of fuel to be used for electric generation a number of factors have to be reviewed and evaluated, each of which will have a bearing on total fuel costs for any one location. The cost of transportation, anti-air pollution devices, storing, handling and disposing of the fuel product are economic factors which can make a low cost fuel the most expensive fuel. Therefore, while a general picture can be drawn of the availability and price of fuels, the final determination in selecting a fuel or fuels for a particular plant must be based on the specific facts pertinent to that plant and its location.

During the past twenty years the coal industry has contributed a great deal to the stability of fuel prices. Mechanization of the mines has enabled the industry to either reduce or at least maintain within reasonable limits the price of its product, in spite of continuing increases of over-all price indexes. During the period 1970-1990 it is expected that there will be continuing improvement in the mechanization and handling of coal at the mine. Some of the new developments in underground mining in recent years have been the use of a mobile bridge conveyor which has increased the productivity from a continuous miner substantially, the underground push-button miner, the installation of long wall mining equipment, and the application of computer simulation techniques.

Although coal is available in sufficient quantities in the West Central Region to supply the entire energy requirements of the electric utilities in this region, competition will determine the extent to which coal will penetrate each market.

temperature to 86°F. Cooling towers are included in the design of two large nuclear plants presently under construction in anticipation of state agency temperature limitations of 86°F. for mixed water or 5° over ambient. Capital costs for cooling facilities to date are estimated at $10,000,000 for plants totaling 2700 megawatts.

One utility in the area is constructing a 20 megawatt plant utilizing a recently developed air cooled condenser. This plant is to be a prototype for larger plant installations now under consideration. Because this type of facility eliminates the need for large quantities of cooling water, it may provide greater freedom in the siting of moderate size generating facilities.

In addition to state and local agencies, the Air Quality Act of 1967 introduces a new factor. The Secretary of Health, Education, and Welfare is to designate air quality regions and issue criteria and control technology documents. The governors of states involved will have approximately nine months to draw up standards acceptable to HEW and another six months to establish a method of control for the region. Additional research and development of control technology is being funded under the Air Quality Act, but to date the control strategies commercially available to the utilities are largely the use of precipitators and high stacks.

The concern of Wisconsin companies for proper and effective control of air and water pollution has been expressed by the formation of an active task force on air and water criteria. This task force, which is sponsored by the Wisconsin Utilities Association, has been working with the Wisconsin State Department of Natural Resources to provide the Department with data on the problems of establishing adequate criteria for the control of air and water pollution. This task force has provided the Department with information on studies being conducted by a number of Wisconsin utilities. It is hoped that the results of these studies will provide the industry with knowledge that can be used to properly assess the degree and consequence of water and air pollution.

The problem of air pollution weighs heavily in the choosing of generation sites, the type of fuel used, the capital costs of equipment to maintain acceptable conditions, and ultimately on what the cost to the customer will be. The future will remain uncertain until air quality and emission standards are defined more clearly and equipment for reducing sulfur emissions is developed and becomes available commercially.

IV

COORDINATED PLANNING AND DEVELOPMENT

I. Structure of the Industry

Fifty-one interconnected systems currently generate approximately 95% of the energy consumed through electric utility service in the West Central Region. Table I below provides 1967 data as to number and size of these major utilities in the various ownership segments of the industry. This group generally can be described as consisting of those systems providing virtually all of the high voltage system facilities in this region.

Table I

Type of Ownership	Utilities	Non-Coincidental Peak Load (MW)	Gen Cap (MW)	Energy Prod (1000 MWH)
Investor-owned	25	22 954	26 032	118 566
Rural electric G&T cooperatives	19	1 657	1 382	5 646
State	6	1 461	1 120	4 226
Federal	1	746	2 048	9 692
	51	26 818	30 582	138 130

1967 load and capacity data for the individual major utilities in each ownership segment are shown in Appendix A.

In addition to these major utilities there are about 1000 other utility entities involved in generation and/or distribution of electric energy. These are identified as to type of ownership, size and general location in Appendix B.

II. Trends in the Development of Coordination Mechanisms

At present, nine coordinating organizations function within the region as follows:

Wisconsin Public Service Corporation-Wisconsin Power and Light Company-Madison Gas and Electric Company Pool
Wisconsin-Upper Michigan Systems
Illinois-Missouri Pool
Iowa Pool
Mid-America Interpool Network
Mid-Continent Area Power Planners
Missouri Basin Systems Group
Nebraska Public Power System
Upper Mississippi Valley Power Pool

Coordination areas of these organizations are shown in Figures 1-3. Appendix C presents first a brief summary and then detailed information on each body and its structure, purposes, and activities.

It is emphasized that there are no particular discontinuities in the pattern of interconnections at the boundaries of these organizations. Numerous other interconnection agreements and inter-relations exist that provide mechanisms for liaison and continuity in coordination across the region as demonstrated by the examples enumerated below:

1. MAIN and MAPP have overlapping membership with eight utilities being members of both of these organizations. This liaison arrangement is deemed particularly desirable for close coordination in planning and operation along the recently completed Twin Cities-Milwaukee-Chicago-St Louis-Twin Cities 345 kv loop. Operation of this loop and all other interconnecting transmission lines, and those otherwise mutually affected, is provided through established operating committees, through system simulation operating studies, and through continuous liaison between the respective coordination offices. The studies consist of current year operating studies, transfer capacity studies, and extreme disturbance studies. The areas of coordinated planning are handled through the planning arms of each of the organizations. Much of the planning is based upon

the aggregate load and capability forecasted and includes not only consideration of new facilities but also the future use of the interconnecting transmission facilities and power transactions to effect optimal use of generating equipment.

2. MAPP and MBSG liaison on projects of mutual interest is handled through the Intersystem Coordinating Committee. This committee was established by the respective organizations in 1965. Prior to the establishment of the MAPP Coordination Office and the associated Coordinating Committee, the Intersystem Committee organized an interim task force to review relay operating practices to assure that relaying of mutual interest would provide a reliable operation. Progress has been slow in the area of joint planning of transmission and generation and the committee itself has recently proposed that its parent organizations reconsider its membership and better define its responsibilities in the interest of improving progress.

3. All members of the Iowa Pool and UMVPP belong to the MAPP organization and have thereby broadened their capabilities in the traditional pooling activities of coordinated planning of generation and transmission, including power transactions, and coordinated operation of generation and transmission including short and long term maintenance scheduling, economy energy interchange, voltage profiles, automatic under-frequency load shedding, and dispatching procedures. This broadening comes about through the overview afforded in considerations of the Planning Committee which is geographic in its representation and through participation in the Coordinating Committee associated with the Coordination Office.

4. All members of the Wisconsin Power Group and Illinois-Missouri Pool belong to the MAIN organization.

5. MAPP-MAIN-UMVPP-Iowa Pool liaison, together with USBR participation in the MAPP Coordination Center, has resulted in development of an extensive teletype communication system permitting broad area coordination on day to day operating matters.

The area is presently served by three teletype

systems, all of which employ rented telephone company facilities. Cost sharing varies in each of the three systems ranging from equal shares to formulas using both number and size of systems involved. Teletype stations are located in the dispatching offices of the participating systems and the coordination centers. Use is limited to exchange of operating information and weather information.

The present systems are:

MAIN	15 terminals - 5 in Wisconsin, 4 in Illinois - 2 in Minnesota (MAPP & NSP), 2 in Missouri (UE & AEC), 1 in Little Rock, Arkansas (SCEC) 1 in Canton, Ohio (AEP ECAR)
UMVPP	10 terminals - 1 in North Dakota, 1 in South Dakota, 6 in Minnesota, 1 in Wisconsin, 1 in Iowa
USBR	1 in South Dakota
IOWA POOL	10 terminals - 2 in Minnesota (MAPP & NSP), 7 in Iowa, 1 in St Louis, Missouri (UE)

The UMVPP and Iowa Pool systems will be replaced in April 1969 by one MAPP system containing 25 terminals. This will include the present terminals plus new terminals for other MAPP members and adjacent utilities. The system will be comprised of 2 terminals in North Dakota, 6 terminals in Minnesota, 2 in Wisconsin, 2 in South Dakota (including USBR), 8 in Iowa, 2 in Nebraska (OPPD and CPPD), and 3 in Missouri (UE, St Joseph L&P and KCP&L). The MAPP system will utilize 100 wpm teletypes under the control of an automatic polling device located in the MAPP Center. All transmission will be by punched tape except during emergencies when an emergency override will permit manual transmission. Cost sharing will be according to a formula intended to recognize size of systems, mileage between adjacent terminals, and benefits accruing equally regardless of size.

6. As planning of specific facilities reaches a point in progress where the coordinating organization is agreed on the basic function and design, the participating utilities are represented on a number of task forces having responsibility for design, contractual arrangements, and use. The task force membership straddles organizational lines and provides further opportunities for coordination of associated facilities.

III. Projections of Future Coordinating Requirements

The following discussion of possible future organizational arrangements among electric utilities is in reference to the fifty-one systems identified in Section I as providing 95% of the electric service in the region. It is, of course, recognized that corporate consolidations will very likely reduce the number of separate entities in the future. However, there is no basis for predicting the specific patterns or timing such consolidations may follow other than a general reference to those already announced to be under study.

By 1970, MAPP intends to increase the coordination among the various parts of the MAPP organization, including the Iowa Pool, the UMVPP, and its Nebraska members by developing a super-pool agreement. This consolidation will result in these five sub-regional systems remaining as workable coordinating entities within the West Central Region:

Commonwealth Edison Company
Eastern Wisconsin Utilities (including the Upper Peninsula)
Illinois-Missouri Pool (including Central Illinois Light Company)
Mid-Continent Area Power Planners
Missouri Basin Systems Group

Each of these systems will exercise primary responsibility for planning and operation within their area, particularly with respect to economic matters.

With regard to reliability-oriented coordination, MAIN would continue with its present inter-pool operation in the eastern part of the region. Reliability-oriented coordination for the western portion of the region is expected to be provided by the recently executed Mid-Continent Area Reliability Coordination Agreement either expanded to include MBSG members

or through liaison arrangements with a separate MBSG reliability group.

Future patterns of generation and transmission developments prepared by the WCRAC contemplate 765 kv and 500 kv transmission lines across the region in the 1980's. These lines will provide capacity for meaningful power exchanges on a region-wide basis and also increase the interdependency among systems, particularly with respect to reliability. It is therefore proposed that a single West Central Reliability organization be established by 1980. In view of the large number of systems involved, manageability considerations dictate an interpool-type organization such as MAIN with the five above-identified area systems as members.

The foregoing material relating to future coordination patterns has been presented at meetings of the MAIN, MAPP and MBSG organizations in an effort to solicit views of utilities not represented on the WCRAC.

IV. Problems and Solutions

Operation of an electric power system is a complex matter involving the consideration of innumerable electrical elements and many people. Taken as a whole, the configuration changes from season to season, from day to day, and from hour to hour. To operate all of the interconnected electrical systems within a region in a truly coordinated manner becomes a tremendously complex matter requiring knowledgeable people, the necessary equipment and communications for the required overview, and of equal importance a strong desire on the part of all of those so engaged. That this coordination can be accomplished, and must be accomplished, is fully appreciated and has been taken on as a challenge of considerable substance by the utilities in this region.

It is recognized that the true strength of the operation is in the local knowledge of each area's needs and the resources available to supply these needs. The requirement then is for a coordinating effort which will supply the involvement necessary to do the job but which will not unnecessarily interfere in operations that can be adequately handled locally. Furthermore, it cannot be expected that a coordinating effort can be arbitrarily overlaid on the existing operation. Instead a coordination evolution is required which will gradually develop the capability of the coordinating organization and, in turn, the confidence of the participating systems with a resultant

growing willingness to accept the decisions and judgement of the coordinating personnel and to encourage their efforts.

Within the West Central Region there are variations in the nature of systems and load densities across the region producing differences in coordination problems and requirements. For example, a relatively few systems along the eastern edge of the region (Eastern Wisconsin Utilities, Commonwealth Edison, and the Ill-Mo Pool) generate almost 60% of the region's requirements while serving 15% of its area. As a result, pooling and interconnection arrangements appropriate for this area are markedly different than those applicable to the large number of systems serving the remainder of the region. Many types of utilities are represented with varying characteristics including that of size and of financing within the major groupings. Because of the hour-to-hour vital need to have a reliable operation, the coordinated operation of these systems has proven to be an endeavor not significantly affected by this dissimilarity. In the area of planning, substantial strides have been made in coordinating planning of both generation and transmission. As previously noted, only MAPP and MBSG have yet to fully coordinate their efforts. This situation is recognized by both organizations and is under active consideration.

V. Interregional Coordination

There are two formal arrangements for interregional coordination identified as such. These are the liaison arrangement between MAIN and ECAR, and MAIN and MAPP membership in the National Electric Reliability Council. Beyond these there are numerous bilateral interconnection agreements and other established channels for coordinated planning and operation with electric systems in adjacent regions.

The USBR has membership in both the Western Systems Coordination Council (WSCC) and the MAPP Coordination Committee and MAPP operating representatives attend WSCC operating meetings. These arrangements, along with these inherent within the USBR, provide liaison with the west lying region.

Some multi-system coordination activities involving other regions are: The MIIO Agreement among Commonwealth Edison and five major utilities in Indiana and Michigan, which, among other returns, resulted in system performance studies in depth which included Commonwealth Edison Company as a participant and enveloped the eastern portion of this region.

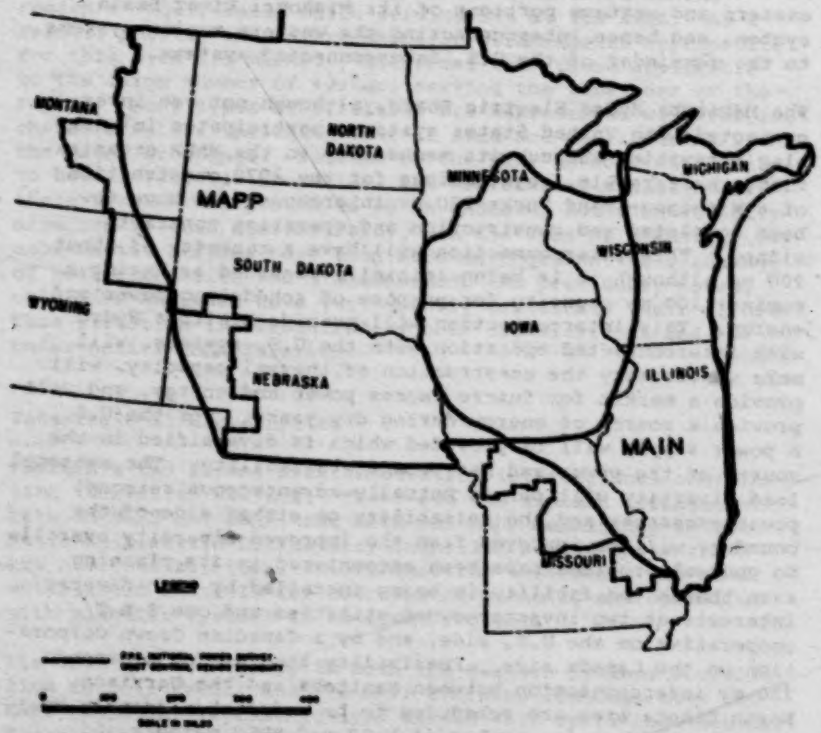
The Twin Cities-Kansas City 345 kv Coordinating Agreement - among four MAPP members and Kansas City Power and Light Company and St Joseph Light and Power Company in the South Central Region, which provides for the exchange of power and energy with the aim of optimizing the utilization of generation and bettering reliability. And the East-West Tie Closure Task Force, which was formed for the express purpose of studying the feasibility of and the procedures for closing the Bureau of Reclamation ties between the eastern and western portions of its Missouri River Basin system, and hence interconnecting the western region systems to the remainder of the U.S. interconnected systems.

The Manitoba Hydro Electric Board, although not yet interconnected with United States systems, participates in planning activities through its membership in the MAPP organization. As a result, negotiations for the 1970 construction of a Winnipeg-Grand Forks 230 kv interconnection have now been completed and construction and operating contracts signed. This interconnection will have a capacity of about 200 mw although it is being initially regarded as having a nominal 100 mw capacity for purpose of scheduling power and energy. This interconnection will provide Manitoba Hydro with interconnected operation with the U.S. systems, will make unnecessary the construction of thermal capacity, will provide a market for future excess power and energy, and will provide a source of energy during dry years. For the U.S., a power supply will be provided which is diversified in the source of the power and has prompt availability. The seasonal load diversity will permit mutually advantageous seasonal power exchanges and the reliability on either side of the boundary will be improved from the improved diversity overall. No unusual problems have been encountered in its planning even though the facility is being installed by such diverse interests as two investor-owned utilities and one G & T cooperative on the U.S. side, and by a Canadian Crown Corporation on the Canada side. Feasibility studies for a second 230 kv interconnection between Manitoba and the Garrison, North Dakota area are scheduled to be undertaken jointly by Manitoba Hydro and a number of MAPP and MBSG members.

WEST CENTRAL REGION

COORDINATION AREAS

MID-CONTINENT AREA POWER PLANNERS-MID-AMERICA INTERCONNECTED NETWORK

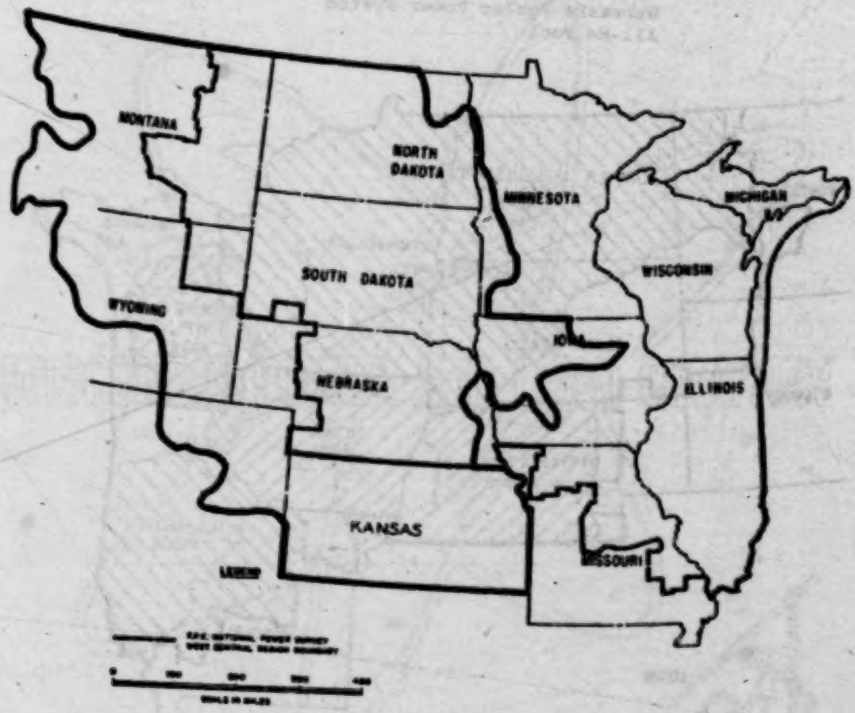


NOTE: Boundaries indicate general areas and do not necessarily include all systems within an area.

Figure 1

WEST CENTRAL REGION
COORDINATION AREA

MISSOURI BASIN SYSTEMS GROUP

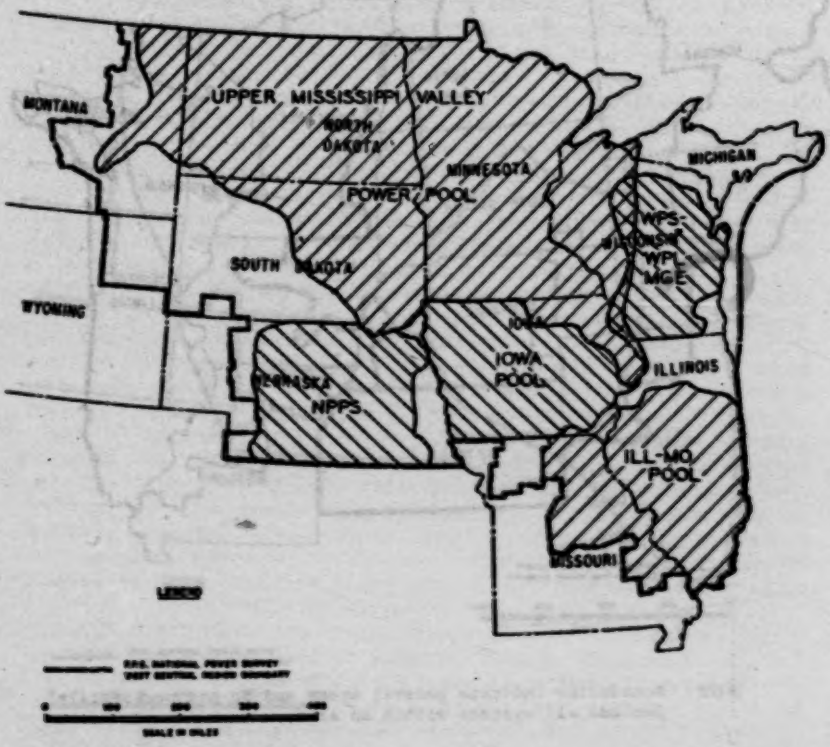


NOTE: Boundaries indicate general areas and do not necessarily include all systems within an area.

Figure 2

WEST CENTRAL REGION
OPERATING AREAS

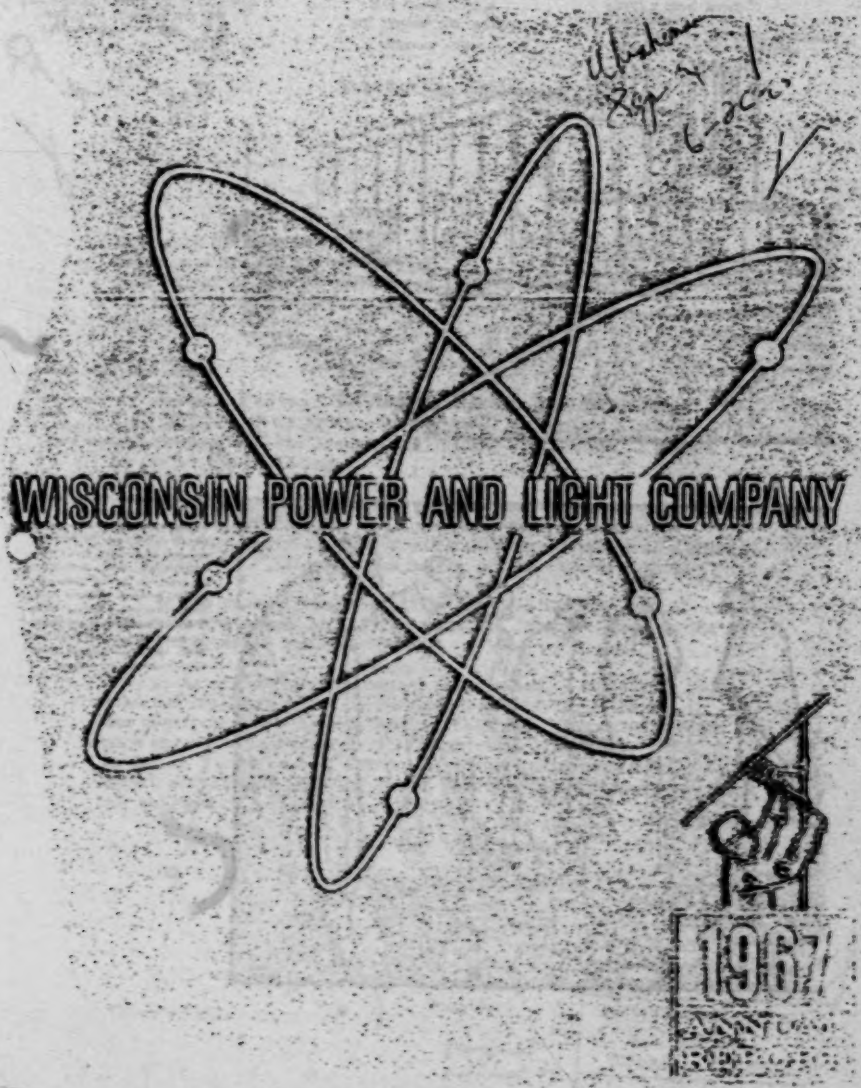
Upper Mississippi Valley Power Pool
WPS-WPL-MGE Pool
Iowa Pool
Nebraska Public Power System
Ill-Mo Pool



NOTE: Boundaries indicate general areas and do not necessarily include all systems within an area.

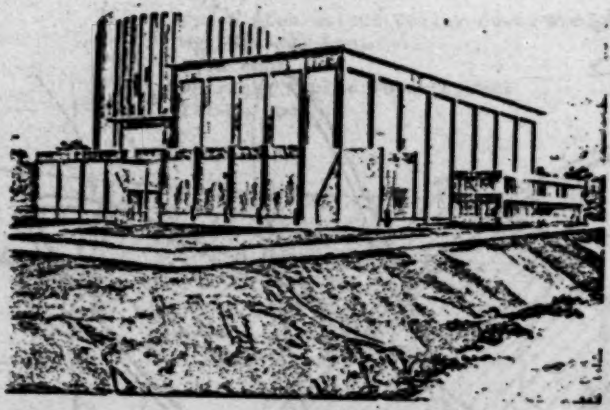
Figure 3

ABRAHAMSON DEPOSITION
EXHIBIT 1



ABRAHAMSON DEPOSITION
EXHIBIT 1A

Abrahamson
Dep Ex 1-A
6-26-79



Tennessee Valley Public Power Association will mark the 4th unit completed in 1972. The plant, jointly owned with two other utilities, is expected to generate power soon economically than present plants.

Official ceremonies marking the beginning of construction of the Tennessee nuclear plant were held at the site on November 22. Principals included, left to right, Carl J. Fernberg, Chairman, TVPPA; Archie Boehler, Chairman, Town of Cadiz; Lee Benson, President, Wisconsin Public Service Corporation; Edward Zeller, Chairman, Madison Gas and Electric Company; J. Ben Stewart, President, TVPPA; and D. L. Caldwell, Chairman, Tennessee County Board.

BECK DEPOSITION EXHIBIT 1

CLARENCE V. BECK & CO., INC.
GILLESPIE COAL MINING CO.
LITTLE DOG COAL CO.

1724 RAILWAY EXCHANGE BLDG.
611 OLIVE STREET
ST. LOUIS, MO. 63101

LITTLE DOG MINE
GILLESPIE, ILL.
ON ILLINOIS TERMINAL RAILROAD
DAILY CAPACITY - 2000 TONS

November 14, 1968

Antitrust Division,
Department of Justice,
2638 United States Courthouse and Federal Office Building,
219 South Dearborn Street,
Chicago, Illinois 60604

Gentlemen:

Referring to your inquiry addressed to the Little Dog Coal Company, in regard to the merger of the United Electric Coal Company and the Freeman Coal Mining Corporation, I desire to advise the following.

The Little Dog Coal Company ceased business on November 30, 1967. An application for an 11b Receivership is before the United States District Court for the Southern District of Illinois at Springfield, Illinois. The number of the case is S-Bk-68-973.

At the present time the Little Dog Coal Company has no employees whatsoever and it is impossible for us to look up the detailed evidence that you request.

As an officer of the defunct corporation, I can advise you that the Little Dog Mine is located at Gillespie, Illinois, in the center of the Illinois Terminal Railroad. The output of the mine was marketed mainly locally along that line and by truck. As far as I know none of the coal from this mine came into direct competition with the United Electric Coal Company at any point during its entire history.

Very truly yours,

LITTLE DOG COAL COMPANY

C. V. Beck,
President

Original returned by Mr. Crouch

60-0-37-920 6
DEPARTMENT OF JUSTICE
NOV 15 1968
DIVISION OF ANTITRUST

3

BRAZZALE DEPOSITION
EXHIBIT 1

4/14/69 B

GENERAL SERVICES ADMINISTRATION
PUBLIC BUILDINGS SERVICE

HEATING FUEL ECONOMIC ANALYSIS

1. REGION: 5
2. BUILDING NAME OR NO.: F.O.B. & U.S. COURTHOUSE
3. LOCATION (City and State): CHICAGO, ILLINOIS
4. GROSS VOLUME (Cu. Ft.)
5. RADIATION (Sq. Ft.)
6. NO. OF BOILERS: 3
7. RATING OF EACH BOILER: ONE 29,000 #/HR; TWO 50,000 #/HR
8. BOILER PRESSURE (Lbs.): 150 PSI

ITEM		FUEL (For conversions, check (√) present fuel)			
		√ COAL	√ #6 OIL & INTERRUPT.	√ GAS ALL YEAR	√ #2 OIL & INTERRUPT. GAS
9. PERSONNEL (Number)	A. ENGINEERS				
	B. FIREMEN $5.20/hr	3	6's		GAS
	C. COAL PASSERS OR HELPERS				
	D. OTHER (Specify)				
10. ANNUAL FUEL CONSUMPTION (Number)	A. COAL (Tons) ANTHRACITE .7% S_2	4200			
	B. GAS (Hundreds-feet) THERMS	911900	911,900	1,751,000	911,900
	C. OIL (Gallons)		59,420		706,000
	D. OTHER (Specify)				
11. PRICES	A. COAL (Per ton delivered in Bin)	24.00			
	B. GAS (Per Hundred-feet) THERM	.03+ 5.9%		(2) SEE REMARKS	22¢/THERM
	C. OIL (Per gallon delivered in tank) (1)	24¢	21¢		18
	D. OTHER (Specify)				
12. FUEL AS FIRED	A. BTU PER UNIT OF FUEL				
	B. EFFICIENCY				
13. INITIAL COST	A. NEW CONSTRUCTION (FUEL OIL STOR TANKS)		25,000		25,000
	B. CONVERSION (3)		70,000	60,000	66,000
	C. TOTAL INCLUDE DUST COLLECTORS	30,000	95,000	60,000	91,000
14. ANNUAL COST	A. MAINTENANCE				
	B. LABOR 3 FIREMEN	33,300			
	C. FUEL*	126,000	76,000	108,750	154,500
	D. ASH DISPOSAL FROM PRODUCTS	800			
	E. ELECTRIC POWER GAS BOOSTER			750	
	F. STEAM FOR ATOMIZING		NEG		NEG
	G. PUMPING OIL (STM. BTU'S PER THERM)		1000		250
	H. DEPRECIATION & INTEREST (2% of Line 13c)	600	1900	1200	1980
	I. OTHER (Specify)				
	J. TOTAL (Sum of Lines 14a-14i)	$161,300.00	$ 95,670.00	$ 110,250.00	$ 112,750.00

15. FUEL SELECTED
☐ A. COAL (Underscored) ☐ B. OIL ☐ C. GAS ☐ D. OTHER (Specify)

16. REMARKS

1. CONVERT TWO 50,000 #/HR BOILERS WHICH ARE STOKER FIRED AT PRESENT TO BURN EITHER GAS OR OIL.

2. 1ST 240,000 THERMS @ 6.3¢/THERM, BALANCE @ 5.2¢. ADD 0.5¢/THERM PURCHASE GAS ADJUSTMENT AND 5.64% CITY UTILITY TAX.

3. NO. 6 OIL IS 0.6% SULPHUR MAX.

17. SIGNATURE: M C Brazzale
18. DATE: 2-4-69 4

*Computed on basis of actual monthly rates applicable.

GSA FORM NO. 1289

BURTON DEPOSITION EXHIBIT 1

CH-B-12777—A
Page 6

• • • •

SPECIAL AND SUPPPLEMENTAL PROVISIONS

SPECIAL REQUIREMENTS

Where an agency required, under Scope of Contract Provision, to use the Contracts listed herein finds that the specific articles or services contracted for will not meet a special requirement, articles or services having the same general characteristics needed to meet the special requirement may be procured: Provided, that a prior written waiver of the requirement for using this schedule is obtained from the General Services Administration. Request for such waivers shall be submitted to the Commissioner, Federal Supply Service, General Services Administration, Washington D. C. 20405, in accordance with Section 101-26.401-3 of the Federal Property Management Regulation and any implementing regulations of the requesting agency.

QUOTATIONS: (a) As used in this schedule the term "F. O. B. Mine (cars)" means free on board cars at the mine or at a water front dock. When the price quoted is F. O. B. Mine (cars) at dock, the bidder shall so indicate by inserting a small (d) in parenthesis after the unit price. A price quoted F. O. B. Mine (cars) without explanation or qualification shall mean free on board cars at the mine. (b) Whether or not this schedule shows that bids on any item are invited on the basis of F. O. B. cars destination or delivered-into-bins at destination the bidder may submit such bids, indicating in the item the basis thereof. In connection with a delivered-into-bin destination quotation, the bidder shall state the truck loading point.

Awards will be made on either an F. O. B. mine bid price (shipment to be made on Government Bills of Lading, or on commercial documents to be converted to Govern-

ment Bills of Lading at the destination) or delivered and stored bid price, except as otherwise indicated in the Schedule, unless the bidder indicates in the bid that delivery at the mine will be unacceptable. *F. O. B. mine price must be stated on all bids even though a bid is submitted on a delivered and stored basis.* If an award F. O. B. mine is not acceptable, a separate notation to this effect should be made on the bidding form, and the F. O. B. mine price inserted in proper space. The truck loading point must be specified in the bids based upon truck delivery. Only one price for entire tentative shipping schedule on each item will be considered. Bids offering separate prices for individual shipping periods under an item will not be considered for award.

The Government reserves the right to reject the bid of a bidder who has previously failed to perform properly or complete on time contracts of a similar nature, or a bid of a bidder who is not in a position to perform the contract.

BUREAU OF MINES ANALYTICAL RECORDS: (a) No bid will be considered on coal offered from mines on which the Bureau of Mines does not have analytical records, (b) Whenever the bidder's guaranteed analysis of coal offered or the latest Bureau of Mines analysis of the coal offered shows the offered coal not to be in conformance with the specifications set forth in this Invitation, the bidders offer shall be rejected as being non-responsive.

* * * *

KEYSTONE'S MAP OF THE CO

THE COAL FIELDS OF THE UNITED STATES

GOVERNMENT EXHIBIT
Com. Dep.
1

Commission Deposition Exhibit #1

Anthracite
Low-volatile bituminous
Med. & high-volatile bituminous
Subbituminous
Lignite & brown coal
Producing districts per Bit. Coal Act of 1937
ANTHRACITE
Northern
Western Kentucky
Tennessee
Alabama
Georgia
Virginia
Pocahontas
Upper Potomac
Upper Kanawha
Southwest Va.
Winifrede
Kanawha
Logan
Thacker
Williamson
Sewell Mtn.
Eagle
Coalburg
Powellton
Cedar Grove
Boone
Coalburg
Cabin Creek
Kenova
Hernshaw
Chilton
Peytona
Peytona Seam

MINERAL INDUSTRY SURVEYS

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D. C. 20240

GOVERNMENT EXHIBIT
Cal. Dep.
3

BITUMINOUS COAL AND LIGNITE DISTRIBUTION

CALENDAR YEAR 1967

Prepared March 27, 1968, by Joseph J. Gallagher, Division of Mineral Studies - Mineral Resource Evaluation, 202-343,4869.

Gallagher Depo Ex #3
12-12-18

BITUMINOUS COAL AND LIGNITE DISTRIBUTION
CALENDAR YEAR 1967

This report shows the distribution of bituminous coal and lignite in the United States during the calendar year of 1967 from coal producing districts of origin to geographic divisions and States of destination, broken down by methods of transportation and types of consumer use, and a comparative summary of total distribution during the calendar years of 1967 and 1966 by geographic divisions and States of destination, methods of transportation, and types of consumer use. This information provides individuals in the industry, the coal industry as a whole, the Government, and others with a better understanding of the participation of bituminous coal and lignite in the various energy markets of the Nation, both locally and nationally. The detailed data provide a benchmark for special studies and analyses of many of the factors that influence coal production and its utilization in the highly competitive energy market.

The data shown herein are based on reports submitted to the Bureau of Mines voluntarily by producers, sales agents, distributors, wholesalers and Great Lakes and tidewater commercial dock operators who normally produce or sell 100,000 tons or more annually. The Bureau sincerely appreciates the splendid cooperation of the producers and shippers in filing their individual reports, without which this report would not have been possible.

A separate report was requested for each coal producing district in which a company operated mines or from which it marketed coal. The coal producing districts are the districts recognized by the bituminous coal and lignite mining industries and are defined on page 3 of this report.

The producing and selling companies covered in the surveys accounted for about 94 percent of all coal produced during the periods covered. The report includes tonnages of coal which the companies covered in the surveys purchased for resale and marketed for smaller producing companies. All reports were edited carefully and verified against data from all other available sources. In order to account for total industry shipments during the periods, estimates for the remaining 6 percent of total shipments are included, based on data from coal trade and other reliable coal statistical reporting agencies.

Shipments from some of the coal producing districts differ slightly from the estimated net district production tonnages reported elsewhere by the Bureau of Mines for the reason that the coal distribution data, in some cases, include raw coal which is cleaned at the points of consumption whereas "production" reports pertain to estimates of clean coal only. Also, the distribution information includes some tonnages from small mines with annual output of less than 1,000 tons, the tonnages of which are marketed by and included as part of the shipments of larger producing and selling companies. The Bureau excludes from its standard production figures mines producing less than 1,000 tons per year.

Because of the detailed breakdown of the distribution statistics, certain figures cannot be shown separately without disclosing some of the data of companies that indicated on their report forms that their data may not be revealed. In most of such cases combinations have been made within each producing district of various "consumer uses," and "methods of movement". These combinations are indicated by brackets or explained in detail in the footnotes. In order to avoid distorting many tonnage data items that otherwise can be revealed and at the same time to keep the number of data items combined or footnoted to the irreducible minimum, the distribution report contains in the detailed "State of Destination" portion a section devoted to the summary of the smaller tonnage items not revealable, broken down by district of origin, method of movement, and consumer use, under the caption "Destinations not revealable". On the national basis the tonnages contained in "Destinations not revealable" in the calendar year of 1967 amount to 994,000 tons or only 0.2 percent of the grand total shipments during the period. The individual district totals range from no tonnages for some districts to a high of 0.9 percent of the district total in District 11. Also, District 6 (West Virginia Panhandle) has been combined with District 5 (Northern West Virginia) and District 22 (Montana) has been combined with District 23 (Washington) to conceal individual company data.

The data are arranged in Table I to show shipments of bituminous coal and lignite during the calendar year of 1967 from each producing district to each State of destination for each consumer use therein (except railroad fuel) by all methods of movement, and, where possible, by (1) all-rail; (2) river and ex-river; (3) Great Lakes; (4) tidewater; (5) truck; and (6) tramway, conveyor, and private railroad. Following the data that are available by States of destination, consumer use, and method of movement, tonnages are shown for items for which destination and/or consumer use are not available. These items are: (1) shipments to Canadian Great Lakes commercial docks; (2) vessel fuel; (3) shipments to U.S. Great Lakes dock storage; (4) overseas exports; (5) bunker fuel; (6) shipments to U.S. tidewater dock storage; (7) railroad fuel; (8) coal used at mines and sales to employees; and (9) net change in inventory. Table II is a comparative summary of distribution of bituminous coal and lignite produced in the United States during the calendar years 1967 and 1966 by geographic division and States of destination, methods of movement, and consumer use.

Respondents were asked to use railroad weights. If the company's records did not show the exact figures, they were asked to estimate the distribution detail required.

1417

All tonnage figures contained herein are in thousand net tons of 2,000 pounds.

The definitions of consumer uses as used in this report follow:

"Electric utilities". All privately owned electric utility companies and all publicly owned agencies engaged in the production and/or distribution of electric light and power. Publicly owned agencies include the following: Municipal electric utilities; Federal projects; rural electrification cooperatives, power districts, and State power projects; and "non-central stations". "Non-central stations" are those which operate to supply electric power primarily for such functions as public street lighting, water pumping, and sewage disposal.

"Coke and gas plants". Bituminous coal that is carbonized for the manufacture of coke, coal chemical materials, and gas at slot and beehive ovens, low- and medium-temperature carbonization operations, and in water gas and other coal gasification processes. This does not include coal used for non-carbonizing purposes such as space heating, foundry use, etc.

"Retail dealers". Any person (including the retail outlet, branch, or department of one who is also a producer, wholesaler, or dock operator), to the extent that he acts in the capacity of a supplier, shipper, or seller of bituminous coal and lignite in any transaction involving a shipment, sale, or sale and delivery to a consumer of broken-bulk bituminous coal and lignite physically handled in a truck, wagon, or other less-than-carload facility, without regard to type of consumer or to the quantity or frequency of delivery. Also, all railroad carload shipments that are delivered to a retail dealer's facilities are to be reported in this category (not including, however, carload shipments that are shipped for his account but not to his plant or facilities).

"All others". All consumers of bituminous coal and lignite other than electric utilities, coke and gas plants as defined above, retail dealers, railroads, coal mines, and mine employees.

"Railroad fuel". All coal shipped to railroad companies for engine, powerhouse, station, and all other uses. Includes coal furnished to locomotive tenders at the mine tipples.

"Vessel fuel". Coal used by vessels, tugs, ferry-boats, or other steam water craft on the Great Lakes.

"Bunker fuel". Coal used by ocean steamers, tugs, ferry-boats, or other steam water craft on tidewater.

"Coal used at mines and sales to employees." Includes coal used at mines for power and heat, coal made into beehive coke at mines, and coal used by mine employees.

Instructions to reporting companies on the reporting of "method of movement" included several distinctions that should be borne in mind by the users of this report. Shipments to United States and Canadian railroads for railroad fuel use are excluded from each specific method of movement. Respondents were requested to report total sales to railroads as railroad fuel, separated only as between United States railroad companies and Canadian railroad companies. All-rail shipments include coal loaded into railroad cars at the mines and hauled to ultimate destination via only rail movement, plus coal hauled by truck to a railroad-siding dumping facility and thence shipped to ultimate destination by rail. River shipments include coal loaded directly into river barges at the mine and coal hauled to river dumping facilities via rail, truck, or other means of transport and thence shipped to ultimate destination via river to customers receiving the coal alongside the river. Ex-river movement includes coal loaded directly into river barges at the mine and coal hauled to river dumping facilities via rail, truck, or other means of transport and thence shipped via river to a river lifting facility from which the coal was transshipped inland to the ultimate consumer or retail dealer located away from the river lifting facility. Great Lakes movement includes coal moving to the dumping piers on Lakes Erie, Ontario, and Michigan for further shipment via the Lakes or for use as vessel fuel. Tidewater movement includes coal shipped to tidewater dumping piers for loading into vessels as cargo or for use as bunker fuel. Respondents were requested to report as truck movement those shipments destined to the ultimate consumer via truck only.

The reporting companies were asked to report "shipments to distributors and wholesalers" only when the final State of destination and/or consumer use on such shipments were not known to the reporting company. Tonnages reported by producers as marketed through these channels were identified by name and address of the distributor or wholesaler, to enable the Bureau to trace the coal to the ultimate State of destination and consumer use.

Users of the distribution data contained herein should bear in mind that these data represent shipments "from" the producing fields and not necessarily consumption or receipts "by" consuming groups or States during the period. "Shipments to" or through certain marketing channels, such as to retail dealers and to storage facilities at Great Lakes and tidewater commercial docks, in some periods may exceed "deliveries from" dealers or facilities to ultimate consumers (primarily because of seasonal factors and coal in transit), while in other periods deliveries from retail dealers and storage facilities may exceed mine shipments to these marketing channels.

Comparable distribution data for the calendar years 1958 through 1966 are available in Bureau of Mines reports, copies of which may be obtained by writing to Chief, Section of Publication Distribution, Bureau of Mines, 4800 Forbes Avenue, Pittsburgh, Pa. 15213.

1418

Definition of Bituminous Coal and Lignite Producing Districts

DISTRICT 1—EASTERN PENNSYLVANIA

Pennsylvania.
Armstrong County (part)—All mines west of Allegheny River, in those areas served by the Pittsburgh & Shawmut Railroad and on the west bank of the River.
Fayette County (part)—All mines located on and east of the Youghiogheny River Valley branch of the Baltimore & Ohio Railroad.
Indiana County (part)—All mines not served by the Pittsburgh branch of the Pennsylvania Railroad.
Westmoreland County (part)—All mines served by the Pittsburgh branch of the Pennsylvania Railroad.
All mines in the following counties:

Bedford	Centre	Elk	Mifflin
Blair	Clearfield	Huntingdon	Somerset
Cambria	Clinton	McKean	Union
Cameron	Elk	Mifflin	Venango

Maryland—All mines in the State.
West Virginia—All mines in the following counties:

Grant	Mineral

DISTRICT 2—WESTERN PENNSYLVANIA

Pennsylvania.
Armstrong County (part)—All mines west of the Allegheny River, in those areas served by the Pittsburgh & Shawmut Railroad and on the east bank of the River.
Fayette County (part)—All mines except those on and east of the Youghiogheny River Valley branch of the Baltimore & Ohio Railroad.
Indiana County (part)—All mines served by the Pittsburgh branch of the Pennsylvania Railroad.
Westmoreland County (part)—All mines except those served by the Pittsburgh branch of the Pennsylvania Railroad.
All mines in the following counties:

Allegheny	Butler	Greene	Washington
Beaver	Fayette	Lawrence	

DISTRICT 3—NORTHERN WEST VIRGINIA

West Virginia.
Barbour County (part)—All mines served by or north of the Monongah & Glen Falls Railroad.
All mines in the following counties:

Barbour	Harrison	Monongalia	Taylor
Doddridge	Lewis	Preston	Tucker
Gilmer	Marion	Randolph	Upshur
Hampshire	Marshall	Ritchie	Wetzel

DISTRICT 4—OHIO—All mines in the State.
DISTRICT 5—MICHIGAN—All mines in the State.
DISTRICT 6—PANHANDLE
West Virginia—All mines in the following counties:

Brooke	Hancock	Marshall	Ohio

DISTRICT 7—SOUTHERN NO. 1

West Virginia.
Fayette County (part)—All mines west of the Gauley River, except those served by the Gauley River Railroad, and all mines served by the Chesapeake & Ohio Railroad and mines served by the Kanawha & Hocking.
McDowell County (part)—All mines in that portion of the county served by the Bay Port branch of the Norfolk & Western Railroad and south thereof.
Raleigh County (part)—All mines served along or to the east of the Chesapeake & Ohio Railroad and south thereof.
Wyoming County (part)—All mines in that portion of the county served by the Bay Port branch of the Norfolk & Western Railroad and south thereof.
All mines in the following counties:

Boone	Kanawha	Nicholas	Summers
Braxton	Lincoln	Putnam	Webster
Clay	Logan	Roane	
Fayette	Mercer	Summers	

DISTRICT 8—SOUTHERN NO. 2

West Virginia.
Fayette County (part)—All mines west of the Gauley River, except those served by the Gauley River Railroad.
McDowell County (part)—All mines west of and served by the Bay Port branch of the Norfolk & Western Railroad.
Mingo County (part)—All mines in that part of the county south of and served by the Chesapeake & Ohio Railroad.
Raleigh County (part)—All mines in the Coal River district, and served by the Coal River branch of the Chesapeake & Ohio Railroad and south thereof.
Wyoming County (part)—All mines in that portion of the county served by the Clarkson branch of the Virginian Railway and the mines of the Pond Fork Railroad.
All mines in the following counties:

Boone	Kanawha	Nicholas	Wayne
Braxton	Lincoln	Putnam	
Clay	Logan	Roane	
Fayette	Mercer	Summers	

Virginia.
Buchanan County (part)—All mines in the county east of the Pocahontas-Deepwater branch of the Norfolk & Western Railroad and north of Levis Creek in tributary of the Levisa Fork and in that portion served by the Pocahontas-Ridge branch of the Norfolk & Western Railroad.
Tazewell County (part)—All mines in the county except in Clear Fork and Laurel Creek districts and in that portion served by the Bay Port branch of the Norfolk & Western Railroad and south of Maitland and Bluefield on the Bluefield & Pocahontas Railroad.
All mines in the following counties:

Dickenson	Wise

Kentucky—All mines in the following counties in southern Kentucky:

Bell	Harlan	Leslie	Pike
Breathitt	Jackson	Letcher	Pulaski
Clay	Johnson	Lincoln	Rockcastle
Floyd	Knott	Magoffin	Whitley
Harlan	Knox	Martin	

Tennessee—All mines in the following counties:

Anderson	Claiborne	Fentress	Scott
Campbell	Cumberland	Morgan	

North Carolina—All mines in the State.

DISTRICT 9—WEST KENTUCKY

Kentucky—All mines in the following counties in western Kentucky:

Butler	Hopkins	Muhlenberg	Union
Christian	Logan	Ohio	Webster
Daviess	McLean	Todd	
Henderson	Marshall	Trigg	

DISTRICT 10—ILLINOIS—All mines in the State.
DISTRICT 11—INDIANA—All mines in the State.
DISTRICT 12—IOWA—All mines in the State.
DISTRICT 13—SOUTHEASTERN
Alabama—All mines in the State.
Georgia—All mines in the following counties:

Dade	Walker

Tennessee—All mines in the following counties:

Bledsoe	Grundy	Rhea	Van Buren
Franklin	Marion	Sequatchie	Warren

DISTRICT 14—ARKANSAS-OKLAHOMA
Arkansas—All mines in the State.
Oklahoma—All mines in the following counties:

Haskell	Le Flore

DISTRICT 15—SOUTHWESTERN
Kansas—All mines in the State.
Missouri—All mines in the State.
Oklahoma—All mines in the following counties:

Coal	Latimer	Pittsburg	Wagoner
Craig	Mayes	Pushmataha	

DISTRICT 16—NORTHERN COLORADO
All mines in the following counties in the State:

Adams	Gilpin	Jefferson	Weld
Boulder	Grand	Larimer	
Clear Creek	Jackson	Park	

DISTRICT 17—SOUTHERN COLORADO
Colorado—All mines except those included in District 16.
New Mexico—All mines except those included in District 18.

DISTRICT 18—NEW MEXICO
New Mexico—All mines in the following counties:

Colfax	McKinley	Rio Arriba	Sandoval
Mora	Rio Arriba	Sandoval	Taos
Quay			

Arizona—All mines in the State.
California—All mines in the State.

DISTRICT 19—WYOMING
Wyoming—All mines in the State.
Idaho—All mines in the State.

DISTRICT 20—UTAH—All mines in the State.
DISTRICT 21—NORTH DAKOTA-SOUTH DAKOTA—All mines in North Dakota and South Dakota.
DISTRICT 22—MONTANA—All mines in the State.
DISTRICT 23—WASHINGTON
Washington—All mines in the State.
Oregon—All mines in the State.
Alaska—All mines in the State.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 BY DISTRICT OF ORIGIN, GEOGRAPHIC DIVISION AND STATE OF DESTINATION, METHOD OF MOVEMENT, AND CONSUMER USE.

(In Thousand Net Tons of 2,000 Pounds)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Shipments to all destinations in United States, Canada, and Mexico, by all methods of movement and consumer use, and overseas exports, total	558,647	43,696	40,890	54,470	45,690	40,973	149,318	47,788	66,083	19,006
Electric utilities	396,177	29,038	8,689	37,788	31,650	2,184	60,739	41,806	43,908	18,879
Coke and gas plants	39,788	3,870	24,643	7,085	-	17,807	36,884	196	8,108	-
Retail dealers	13,789	444	565	938	1,279	1,588	8,074	2,327	8,893	490
All others	99,895	8,880	6,984	8,128	12,198	8,850	30,699	4,870	15,631	6,137
Railroad fuel	1,179	191	3	40	159	151	455	58	160	115
Canadian Great Lakes commercial docks (consumer use not available)	368	15	77	96	99	3	118	-	-	-
U.S. Great Lakes dock storage (consumer use not available)	-68	-8	-13	98	-147	119	-86	16	-41	-
U.S. tidewater dock storage (consumer use not available)	-	-	-	5	-	14	-9	-	-	-
Coal used at mines and sales to employees	1,678	453	84	80	38	688	306	-	45	8
Net change in mine inventory	665	68	-41	68	140	441	-89	35	-48	16
Overseas exports (excludes Canada-consumer use not available)	54,174	1,339	-	714	-	15,708	16,413	-	-	-
Shipments to all destinations in United States, Canada, and Mexico, by specific method of movement and consumer use (excludes railroad fuel, Canadian Great Lakes commercial docks, U.S. Great Lakes and tidewater dock storage, coal used at mines and sales to employees, net change in mine inventory and overseas exports)										
All-rail, total	476,800	35,969	10,138	87,349	30,169	18,948	87,431	18,373	36,873	10,250
Electric utilities	158,940	17,701	1,309	17,199	14,661	1,898	63,383	14,930	23,444	6,807
Coke and gas plants	30,971	8,866	6,540	5,660	-	7,339	17,580	-	8,108	-
Retail dealers	10,984	123	80	883	873	1,808	5,718	1,066	789	811
All others	61,985	5,119	2,203	6,203	5,835	8,543	80,876	3,809	9,932	3,852
River and ex-river, total	99,396	816	30,988	7,734	3,946	5,144	18,719	28,894	19,496	8,653
Electric utilities	65,896	-	8,461	6,087	3,582	71	6,814	21,084	17,811	8,655
Coke and gas plants	27,979	816	17,406	1,809	-	5,050	5,915	-	-	-
Retail dealers	1,805	-	-	-	6	-	334	341	324	-
All others	3,896	-	1,057	402	418	23	3,958	389	1,581	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967
BY DISTRICT OF ORIGIN, GEOGRAPHIC DIVISION AND STATE OF DESTINATION, METHOD OF MOVEMENT, AND CONSUMER USE (cont.)

(In Thousand Net Tons of 2,000 Pounds)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl. Pan.	16	17	18	19	20	21	22&23
Shipments to all destinations in United States, Canada, and Mexico, by all methods of movement and consumer use, and overseas exports, total											
Electric utilities	874	16,091	497	5,135	673	5,546	2,888	5,619	4,060	4,121	1,387
Coke and gas plants	685	9,006	-	1,472	549	2,040	2,880	2,881	786	3,119	665
Retail dealers	-	2,139	435	128	-	2,876	-	87	1,890	-	-
All others	-	136	-	81	43	856	5	114	737	893	79
Railroad fuel	191	813	62	480	77	313	36	684	577	573	838
Canadian Great Lakes commercial docks (consumer use not available)	-	-	-	2	-	-	-	31	5	36	5
U.S. Great Lakes dock storage (consumer use not available)	-	-	-	-	-	-	-	-	-	-	-
U.S. tidewater dock storage (consumer use not available)	-	-	-	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	-	-	-	-	-	-	-	-	-	-	-
Net change in mine inventory	-	8	-	-	4	8	-	8	31	84	4
Overseas exports (excludes Canada-consumer use not available)	-	-5	-	-86	8	21	-7	-	28	74	-
	-	-	-	-	-	-	-	-	-	-	-
Shipments to all destinations in United States, Canada, and Mexico, by specific method of movement and consumer use (excludes railroad fuel, Canadian Great Lakes commercial docks, U.S. Great Lakes and tidewater dock storage, coal used at mines and sales to employees, net change in mine inventory and overseas exports)											
All-rail, total											
Electric utilities	827	9,766	497	2,930	437	4,549	572	1,538	3,774	2,836	1,500
Coke and gas plants	658	3,410	-	2,569	368	1,217	356	788	418	2,088	668
Retail dealers	-	2,988	435	128	-	2,876	-	87	1,890	-	-
All others	-	69	-	33	-	151	-	114	595	854	45
	169	305	62	202	39	305	16	609	479	574	793
River and ex-river, total											
Electric utilities	-	4,454	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	4,073	-	-	-	-	-	-	-	-	-
Retail dealers	-	87	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
	-	894	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED in THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
United States, Canada, and Mexico (continued)										
Great Lakes, total 3/	53,078	844	2,885	6,521	7,660	4,445	24,083	1,569	3,908	1,233
Electric utilities	33,947	242	1,096	5,135	6,350	19	5,870	1,174	2,568	739
Coke and gas plants	13,456	-	843	-	-	3,985	9,208	-	-	-
Retail dealers	3,173	18	158	175	501	222	1,872	83	145	7
All others	2,502	584	654	1,211	809	217	7,053	308	1,197	489
Tidewater, total 3/	21,370	3,734	771	8,076	-	1,212	6,077	-	-	-
Electric utilities	14,597	1,613	37	6,000	-	176	3,699	-	-	-
Coke and gas plants	6,866	790	854	2,048	-	1,033	2,161	-	-	-
Retail dealers	4	1	-	2	-	1	-	-	-	-
All others	903	588	-	26	-	2	217	-	-	-
Trunk, total	47,597	9,569	3,887	3,735	13,652	162	2,090	3,193	6,430	3,748
Electric utilities	25,119	6,420	2,885	3,565	7097	-	1,655	1,706	2,692	1,094
Coke and gas plants	1,154	598	840	38	-	-	-	194	-	-
Retail dealers	3,383	302	338	78	799	97	136	67	727	838
All others	17,941	2,249	3,050	260	5,756	65	301	824	2,981	2,816
Tramway, conveyor, and private railroad, total	16,406	-	741	-	-	-	-	-	-	986
Electric utilities	16,348	-	741	-	-	-	-	-	-	986
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	58	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Kent.Tenn.	16	17	18	19	20	21	22&23
United States, Canada, and Mexico (continued)											
Great Lakes, total 2/	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Tidewater, total 2/	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Truck, total	67	r/ 1,874	-	r/ 2,889	838	r/ 574	2,527	r/ 2,048	r/ 654	r/ 1,151	81
Electric utilities	45	r/ 1,585	-	r/ 1,905	151	385	2,504	r/ 2,035	r/ 378	r/ 1,091	1
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	80	-	16	47	143	3	-	168	39	15
All others	22	209	-	968	640	46	20	13	108	21	65
Tramway, conveyor, and private railroad, total	-	r/ -	-	r/ -	-	r/ -	-	r/ -	r/ -	r/ -	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 23
Destination											
New England											
Massachusetts, total	4,022	890	18	1,187	-	99	1,828	-	-	-	-
All methods of movement:											
Electric utilities	3,418	743	2	961	-	64	1,648	-	-	-	-
Retail dealers	110	41	-	21	-	35	13	-	-	-	-
All others	494	106	16	805	-	2	169	-	-	-	-
All-rail, total	1,466	849	18	530	-	34	28	-	-	-	-
Electric utilities	1,085	706	2	305	-	-	14	-	-	-	-
Retail dealers	109	41	-	80	-	33	15	-	-	-	-
All others	338	104	16	805	-	1	6	-	-	-	-
Tidewater, total	2,556	41	-	657	-	65	1,793	-	-	-	-
Electric utilities	2,333	37	-	656	-	64	1,656	-	-	-	-
Retail dealers	1	-	-	1	-	-	-	-	-	-	-
All others	168	8	-	-	-	1	159	-	-	-	-
Connecticut, total	4,795	2,998	-	1,149	-	838	408	-	-	-	-
All methods of movement:											
Electric utilities	4,030	2,791	-	1,091	-	112	36	-	-	-	-
Coke and gas plants	163	-	-	-	-	-	-	-	-	-	-
Retail dealers	18	-	-	8	-	126	372	-	-	-	-
All others	868	807	-	50	-			-	-	-	-
All-rail, total	1,566	468	-	1,096	-	-	8	-	-	-	-
Electric utilities	1,389	350	-	1,038	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	11	-	-	7	-	-	4	-	-	-	-
All others	166	118	-	50	-	-	4	-	-	-	-
Tidewater, total	3,207	2,536	-	53	-	838	400	-	-	-	-
Electric utilities	2,641	2,441	-	38	-	112	36	-	-	-	-
Coke and gas plants	485	-	-	-	-	-	-	-	-	-	-
Retail dealers	1	-	-	1	-	126	364	-	-	-	-
All others	108	99	-	-	-			-	-	-	-
Maine, New Hampshire, Vermont, and Rhode Island, total	986	49	83	647	-	10	197	-	-	-	-
All methods of movement:											
Electric utilities	719	-	-	538	-	-	187	-	-	-	-
Retail dealers	48	10	3	17	-	9	2	-	-	-	-
All others	165	39	80	92	-	1	7	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 25
Maine, New Hampshire, Vermont, and Rhode Island (continued)											
All-rail, total	734	49	83	647	-	8	7	-	-	-	-
Electric utilities	538	-	-	538	-	-	-	-	-	-	-
Retail dealers	41	10	3	17	-	8	3	-	-	-	-
All others	161	39	80	92	-	-	4	-	-	-	-
Tidewater, total	188	-	-	-	-	8	180	-	-	-	-
Electric utilities	187	-	-	-	-	-	187	-	-	-	-
Retail dealers	1	-	-	-	-	1	-	-	-	-	-
All others	4	-	-	-	-	1	3	-	-	-	-
Middle Atlantic											
New York, total	87,300	9,187	3,035	10,419	476	218	3,969	-	-	-	-
All methods of movement:											
Electric utilities	14,330	4,871	163	7,939	239	-	1,718	-	-	-	-
Coke and gas plants	5,980	1,550	2,358	4	-	186	1,908	-	-	-	-
Retail dealers	148	15	43	74	80	13	-	-	-	-	-
All others	6,842	2,751	471	2,398	217	19	343	-	-	-	-
All-rail, total	81,961	7,396	3,035	8,969	473	38	2,054	-	-	-	-
Electric utilities	9,805	2,959	163	6,584	239	-	-	-	-	-	-
Coke and gas plants	5,649	1,550	2,358	4	-	-	1,763	-	-	-	-
Retail dealers	148	14	43	74	80	13	-	-	-	-	-
All others	6,863	2,873	471	2,307	214	19	291	-	-	-	-
Great Lakes, total	510	-	-	140	1	186	183	-	-	-	-
Electric utilities	189	-	-	189	-	-	-	-	-	-	-
Coke and gas plants	321	-	-	-	-	186	135	-	-	-	-
All others	50	-	-	11	1	-	48	-	-	-	-
Tidewater, total	3,900	882	-	1,886	-	-	1,732	-	-	-	-
Electric utilities	3,739	735	-	1,886	-	-	1,718	-	-	-	-
All others	161	147	-	-	-	-	14	-	-	-	-
Trunk, total	909	909	-	-	-	-	-	-	-	-	-
Electric utilities	577	577	-	-	-	-	-	-	-	-	-
Retail dealers	1	1	-	-	-	-	-	-	-	-	-
All others	331	331	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 83
New Jersey, total	7,865	2,185	34	5,027	-	131	488	-	-	-	-
All methods of movement:											
Electric utilities	6,403	1,671	-	4,647	-	127	131	-	-	-	-
Coke and gas plants	490	-	-		-		357	-	-	-	-
Retail dealers	13	7	-	6	-	-	-	-	-	-	-
All others	957	507	34	378	-	4	40	-	-	-	-
All-rail, total	5,318	2,078	34	3,117	-	19	64	-	-	-	-
Electric utilities	4,354	1,589	-	2,758	-	15	24	-	-	-	-
Coke and gas plants	38	-	-		-		-	-	-	-	-
Retail dealers	13	7	-	6	-	-	-	-	-	-	-
All others	911	482	34	351	-	4	40	-	-	-	-
Tidewater, total	2,553	107	-	1,910	-	112	424	-	-	-	-
Electric utilities	2,049	84	-	1,889	-	112	107	-	-	-	-
Coke and gas plants	458	-	-		-		317	-	-	-	-
All others	46	25	-	21	-	-	-	-	-	-	-
Pennsylvania, total	61,197	19,900	23,982	12,848	224	4,570	4,873	-	-	-	-
All methods of movement:											
Electric utilities	23,595	11,306	5,882	6,360	-	-	47	-	-	-	-
Coke and gas plants	27,369	1,580	13,580	4,180	-	4,330	3,679	-	-	-	-
Retail dealers	781	305	344	81	80	21	10	-	-	-	-
All others	9,452	8,769	4,836	1,687	804	219	537	-	-	-	-
All-rail, total	21,668 2/	8,043 2/	18,031 2/	11,164 2/	195 2/	1,064 2/	2,013 2/	-	-	-	-
Electric utilities	10,428	6,145 2/	3,166 2/	3,884	-	-	5	-	-	-	-
Coke and gas plants	7,448 2/	988 2/	13,889 2/	4,180	- 2/	884 2/	1,693 2/	-	-	-	-
Retail dealers	183 2/	36	19	77	80	21	10	-	-	-	-
All others	3,563	948 2/	1,981 2/	1,683 2/	175 2/	219 2/	305 2/	-	-	-	-
River and ex-river, total	24,191	2/	2/	2/	2/	3,506	2,860	-	-	-	-
Electric utilities	4,148	-	-	-	-	-	48	-	-	-	-
Coke and gas plants	18,690	2/	2/	2/	-	3,506	2,186	-	-	-	-
All others	1,353	-	2/	2/	2/	-	38	-	-	-	-
Tidewater, total	2,805	684	2/	1,076	-	2/	2/	-	-	-	-
Electric utilities	1,789	627	2/	1,076	-	-	-	-	-	-	-
Coke and gas plants	398	-	-	-	-	-	-	-	-	-	-
All others	78	57	-	-	-	2/	2/	-	-	-	-
Truck, total	13,139 2/	7,171 2/	5,931	8	29	-	-	-	-	-	-
Electric utilities	7,850 2/	4,554 2/	3,716	-	-	-	-	-	-	-	-
Coke and gas plants	833 2/	598 2/	235	-	-	-	-	-	-	-	-
Retail dealers	2/	2/	2/	2/	-	-	-	-	-	-	-
All others	4,456	1,770	2,655	4	29	-	-	-	-	-	-

See footnotes at end of table.

1426

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 83
Pennsylvania (continued)											
Tramway, conveyor, and private railroad, total	W	W	W	-	-	-	-	-	-	-	-
Electric utilities	W	W	W	-	-	-	-	-	-	-	-
Coke and gas plants	W	W	-	-	-	-	-	-	-	-	-
East North Central											
Ohio, total	58,786	304	6,464	3,615	31,361	8,542	12,409	2,011	-	-	-
All methods of movement:											
Electric utilities	30,086	280	275	2,917	21,701	79	2,583	2,011	-	-	-
Coke and gas plants	11,610	-	4,863	-	-	1,888	4,867	-	-	-	-
Retail dealers	2,191	7	80	89	1,008	150	977	-	-	-	-
All others	14,899	17	1,008	669	8,672	431	3,982	-	-	-	-
All-rail, total	48,538	W 304	3,614	725	W 15,369	W 8,542	W 12,406	-	-	-	-
Electric utilities	13,357	280	254	41	W 12,095	79	2,583				
Coke and gas plants	7,987	-	2,471	-	-	W 1,888	W 4,867	-	-	-	-
Retail dealers	1,855	7	14	89	812	150	977	-	-	-	-
All others	8,101	W 17	895	652	3,064	431	W 3,979	-	-	-	-
River and ex-river, total	13,419	-	2,483	2,708	8,997	W	W	2,011	-	-	-
Electric utilities	9,809	-	51	2,708	8,997	W	W	2,011	-	-	-
Coke and gas plants	3,198	-	2,390	-	-	W	W	-	-	-	-
Retail dealers	102	-	-	-	-	W	W	-	-	-	-
All others	310	-	2	-	-	W	W	-	-	-	-
Great Lakes, total	3,176	W	-	-	W	W	W	-	-	-	-
Electric utilities	2,568	-	-	-	W	W	W	-	-	-	-
Coke and gas plants	457	-	-	-	-	W	W	-	-	-	-
Retail dealers	54	-	-	-	-	-	W	-	-	-	-
All others	97	W	-	-	-	-	W	-	-	-	-
Truck, total	W 13,593	-	487	106	W 13,055	-	5	-	-	-	-
Electric utilities	7,052	-	310	91	6,651	-	-	-	-	-	-
Retail dealers	802	-	6	-	796	-	-	-	-	-	-
All others	5,739	-	111	17	5,608	-	5	-	-	-	-
Tramway, conveyor, and private railroad, total	W	-	-	-	W	-	-	-	-	-	-
Electric utilities	W	-	-	-	W	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 23
Indiana, total	40,441	-	-	402	-	4,904	8,098	5,679	5,516	15,842	-
All methods of movement:											
Electric utilities	20,624	-	-	-	-	-	650	5,408	3,767	10,799	-
Coke and gas plants	12,581	-	-	393	-	4,823	6,463	-	640	-	-
Retail dealers	1,070	-	-	5	-	32	580	8	19	406	-
All others	6,426	-	-	4	-	47	405	263	1,090	4,637	-
All-rail, total	25,790	-	-	402	-	3/ 4,904	3/ 7,431	3/ 5,679	3/ 5,473	8,955	-
Electric utilities	10,164	-	-	-	-	-	43	3/ 5,408	3/ 3,767	6,332	-
Coke and gas plants	10,970	-	-	393	-	3/ 4,885	3/ 6,463	-	640	-	-
Retail dealers	806	-	-	5	-	32	548	8	19	174	-
All others	3,880	-	-	4	-	47	377	3/ 263	3/ 1,049	2,849	-
River and ex-river, total	8,843	-	-	-	-	-	667	3/	3/	3/ 8,471	-
Electric utilities	8,634	-	-	-	-	-	667	3/	3/	3/ 8,471	-
Retail dealers	32	-	-	-	-	-	32	-	-	-	-
All others	177	-	-	-	-	-	88	3/	3/	-	-
Great Lakes, total	1,351	-	-	-	-	3/	3/	-	-	-	-
Coke and gas plants	1,351	-	-	-	-	3/	3/	-	-	-	-
Truck, total	3,471	-	-	-	-	-	-	-	41	3,430	-
Electric utilities	810	-	-	-	-	-	-	-	-	810	-
Retail dealers	232	-	-	-	-	-	-	-	-	232	-
All others	2,429	-	-	-	-	-	-	-	41	2,388	-
Tramway, conveyor, and private railroad, total	986	-	-	-	-	-	-	-	-	986	-
Electric utilities	986	-	-	-	-	-	-	-	-	986	-
Illinois, total	46,710	-	-	167	12	882	2,961	3,150	38,510	1,088	-
All methods of movement:											
Electric utilities	29,497	-	-	-	-	-	17	2,121	26,825	534	-
Coke and gas plants	5,449	-	-	110	-	507	1,561	-	1,468	-	-
Retail dealers	4,074	-	-	5	12	84	1,258	847	1,831	37	-
All others	9,690	-	-	52	-	231	382	182	8,386	517	-
All-rail, total	25,473	-	-	157	-	693	2,812	3/ 3,150	20,369	3/ 776	-
Electric utilities	13,685	-	-	-	-	-	17	3/ 2,121	13,436	3/ 250	-
Coke and gas plants	5,873	-	-	110	-	350	1,345	-	1,468	-	-
Retail dealers	2,472	-	-	5	-	84	1,188	3/ 847	396	3/ 37	-
All others	3,103	-	-	42	-	231	382	3/ 182	4,869	3/ 489	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 25
Illinois (continued)											
River and ex-river, total	15,395	-	-	10	-	70	128	2/	12,735	2/	-
Electric utilities	13,090	-	-	-	-	-	-	2/	10,891	2/	-
Coke and gas plants	70	-	-	-	-	70	-	-	-	-	-
Retail dealers	889	-	-	-	-	-	128	2/	556	2/	-
All others	1,346	-	-	10	-	-	-	2/	1,306	2/	-
Great Lakes, total	120	-	-	-	12	87	21	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	106	-	-	-	-	87	19	-	-	-	-
Retail dealers	14	-	-	-	12	-	2	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Truck, total	4,551	-	-	-	-	-	-	-	4,239	312	-
Electric utilities	1,613	-	-	-	-	-	-	-	1,329	284	-
Retail dealers	699	-	-	-	-	-	-	-	699	-	-
All others	2,239	-	-	-	-	-	-	-	2,211	28	-
Tramway, conveyor, and private railroad, total	1,169	-	-	-	-	-	-	-	1,169	-	-
Electric utilities	1,169	-	-	-	-	-	-	-	1,169	-	-
Michigan, total	34,959	240	282	1,404	10,381	1,746	18,221	965	1,149	571	-
All methods of movement:											
Electric utilities	19,605	192		1,107		19	8,268	838	249	519	-
Coke and gas plants	4,591	-	282	-	10,381	1,362	3,209	-	-	-	-
Retail dealers	1,485	4		28		230	1,127	10	28	-	-
All others	9,278	44		269		115	5,617	117	872	52	-
All-rail, total	14,834	-	-	104	6,819	229	6,929	597	139	17	-
Electric utilities	8,467	-	-	77	4,896	-	2,932	562	-	-	-
Coke and gas plants	31	-	-	-	-	1	30	-	-	-	-
Retail dealers	1,025	-	-	4	1	185	855	-	-	-	-
All others	5,311	-	-	23	1,922	43	3,132	35	139	17	-
Great Lakes, total	20,125	240	282	1,300	3,562	1,517	11,292	368	1,010	554	-
Electric utilities	11,138	192		1,030		19	5,336	276	249	519	-
Coke and gas plants	4,560	-	282	-	3,562	1,381	3,179	-	-	-	-
Retail dealers	460	4		24		45	292	10	28	-	-
All others	3,967	44		246		72	2,485	82	733	35	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Wisconsin, total	15,581	23	438	424	837	456	3,565	3,112	6,108	620
All methods of movement:										
Electric utilities	8,358	-		48		-	490	2,587	4,362	220
Coke and gas plants	497	-	438	-	837	191	306	-	-	-
Retail dealers	1,914	14		101		176	1,040	105	131	-
All others	4,812	9		275		89	1,727	422	1,615	400
All-rail, total	4,715	-	-	4	3	67	563	2/ 2,106	2/ 3,297	400
Electric utilities	2,598	-	-	-	-	-	64	2/ 1,689	2/ 2,049	-
Coke and gas plants	47	-	-	-	-	-	47	-	-	-
Retail dealers	165	-	-	4	-	58	58	2/ 65	2/ 42	-
All others	2,105	-	-	-	3	9	194	2/ 354	2/ 1,206	400
River and ex-river, total	1,525	-	-	-	-	-	-	2/	2/	-
Electric utilities	1,404	-	-	-	-	-	-	2/	2/	-
Retail dealers	60	-	-	-	-	-	-	2/	2/	-
All others	61	-	-	-	-	-	-	2/	2/	-
Great Lakes, total	9,341	23	438	420	834	389	3,000	1,006	2,811	220
Electric utilities	4,556	-		48		-	426	898	2,313	220
Coke and gas plants	450	-	438	-	834	191	259	-	-	-
Retail dealers	1,669	14		97		118	982	40	89	-
All others	2,646	9		275		80	1,333	68	409	-
West North Central										
Minnesota, total	7,142	12	43	570	211	468	1,311	407	2,695	491
All methods of movement:										
Electric utilities	4,157	-	-	458	49	-	64	196	2,551	53
Coke and gas plants	989	-	-	-	-	397	552	-	-	-
Retail dealers	685	-	15	43	100	43	559	86	39	-
All others	1,391	12	28	69	62	28	356	125	105	438
All-rail, total	1,483	-	-	20	-	-	2/ 91	2/ 295	2/ 2,619	53
Electric utilities	1,188	-	-	20	-	-	-	2/ 196	2/ 2,551	53
Retail dealers	22	-	-	-	-	-	2/ 47	2/ 70	2/ 13	-
All others	213	-	-	-	-	-	2/ 44	2/ 29	2/ 55	-
River and ex-river, total	2,589	-	-	-	-	-	2/	2/	2/	-
Electric utilities	2,398	-	-	-	-	-	-	2/	2/	-
Retail dealers	108	-	-	-	-	-	2/	2/	2/	-
All others	83	-	-	-	-	-	2/	2/	2/	-
Great Lakes, total	3,130	12	43	550	211	468	1,220	112	76	438
Electric utilities	221	-	-	438	49	-	64	-	-	-
Coke and gas plants	989	-	-	-	-	397	552	-	-	-
Retail dealers	685	-	15	43	100	43	512	16	26	-
All others	1,235	12	28	69	62	28	512	96	50	438

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	Wash
Wisconsin, total (continued)	-	-	-	-	-	-	-	-	-	-	-
All methods of movement:											
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
River and ex-river, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
West North Central											
Minnesota, total	-	-	-	65	-	-	-	-	-	869	-
All methods of movement:											
Electric utilities	-	-	-	65	-	-	-	-	-	701	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	168	-
All-rail, total	-	-	-	65	-	-	-	-	-	869	-
Electric utilities	-	-	-	65	-	-	-	-	-	701	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	168	-
River and ex-river, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Iowa, total	5,549	-	-	-	-	65	157	419	3,569	77
All methods of movement:										
Electric utilities	3,227	-	-	-	-	-	-	225	1,950	-
Retail dealers	355	-	-	-	-	-	135	136	75	-
All others	1,967	-	-	-	-	65	4	58	1,544	77
All-rail, total	4,368	-	-	-	-	65	124	144	2,743	77
Electric utilities	2,250	-	-	-	-	-	-	-	-	-
Retail dealers	330	-	-	-	-	-	120	144	2,743	-
All others	1,788	-	-	-	-	65	4			77
River and ex-river, total	1,095	-	-	-	-	-	-	269	826	-
Electric utilities	952	-	-	-	-	-	-	-	-	-
Retail dealers	6	-	-	-	-	-	-	269	826	-
All others	137	-	-	-	-	-	-	-	-	-
Great Lakes, total	19	-	-	-	-	-	13	6	-	-
Retail dealers	19	-	-	-	-	-	13	6	-	-
Truck, total	67	-	-	-	-	-	-	-	-	-
Electric utilities	45	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	22	-	-	-	-	-	-	-	-	-
Missouri, total	9,389	-	18	-	-	130	122	28	5,651	-
All methods of movement:										
Electric utilities	6,944	-	-	-	-	-	-	9	3,758	-
Coke and gas plants	219	-	16	-	-	130	73	-	-	-
Retail dealers	189	-	-	-	-	-	4	11	119	-
All others	2,037	-	2	-	-	-	45	8	1,774	-
All-rail, total	4,547	-	2	-	-	85	5	28	3,085	-
Electric utilities	3,246	-	-	-	-	-	-	9	-	-
Coke and gas plants	85	-	-	-	-	85	-	-	2,024	-
Retail dealers	95	-	-	-	-	-	4	11	-	-
All others	1,121	-	2	-	-	-	1	8	1,061	-
River and ex-river, total	1,782	-	16	-	-	45	117	-	1,604	-
Electric utilities	1,601	-	-	-	-	-	-	-	1,601	-
Coke and gas plants	134	-	16	-	-	45	73	-	-	-
All others	47	-	-	-	-	-	44	-	3	-
Truck, total	3,060	-	-	-	-	-	-	-	962	-
Electric utilities	2,097	-	-	-	-	-	-	-	252	-
Retail dealers	94	-	-	-	-	-	-	-	710	-
All others	869	-	-	-	-	-	-	-		-

See footnotes at end of table.

1432

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	24&25
Iowa, total (continued)	874	-	-	404	-	6	-	-	-	-	-
All methods of movement:											
Electric utilities	683	-	-	369	-	-	-	-	-	-	-
Retail dealers	-	-	-	5	-	6	-	-	-	-	-
All others	191	-	-	30	-	-	-	-	-	-	-
All-rail, total	807	-	-	404	-	6	-	-	-	-	-
Electric utilities	638	-	-	369	-	-	-	-	-	-	-
Retail dealers	-	-	-	5	-	6	-	-	-	-	-
All others	169	-	-	30	-	-	-	-	-	-	-
River and ex-river, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
Truck, total	67	-	-	-	-	-	-	-	-	-	-
Electric utilities	45	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	22	-	-	-	-	-	-	-	-	-	-
Missouri, total	-	-	-	3,440	-	-	-	-	-	-	-
All methods of movement:											
Electric utilities	-	-	-	3,177	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	55	-	-	-	-	-	-	-
All others	-	-	-	208	-	-	-	-	-	-	-
All-rail, total	-	-	-	1,542	-	-	-	-	-	-	-
Electric utilities	-	-	-	1,295	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	49	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
River and ex-river, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	2/ 2,098	-	-	-	-	-	-	-
Electric utilities	-	-	-	3/ 1,939	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	159	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Missouri, (continued)										
Tramway, conveyor, and private railroad, total	W	-	-	-	-	-	-	-	-	-
Electric utilities	W	-	-	-	-	-	-	-	-	-
North and South Dakota, total	3,427	-	-	6	-	4	35	-	10	-
All methods of movement:										
Electric utilities	2,622	-	-	-	-	-	-	-	4	-
Retail dealers	367	-	-	6	-	4	35	-	-	-
All others	438	-	-	-	-	-	-	-	6	-
All-rail, total	2,855	-	-	-	-	-	-	-	10	-
Electric utilities	1,531	-	-	-	-	-	-	-	4	-
Retail dealers	265	-	-	-	-	-	-	-	-	-
All others	437	-	-	-	-	-	-	-	6	-
Great Lakes, total	43	-	-	6	-	4	35	-	-	-
Retail dealers	43	-	-	6	-	4	35	-	-	-
Truck, total	W 1,151	-	-	-	-	-	-	-	-	-
Electric utilities	W 1,091	-	-	-	-	-	-	-	-	-
Retail dealers	59	-	-	-	-	-	-	-	-	-
All others	1	-	-	-	-	-	-	-	-	-
Tramway, conveyor, and private railroad, total	W	-	-	-	-	-	-	-	-	-
Electric utilities	W	-	-	-	-	-	-	-	-	-
Nebraska and Kansas, total	1,854	-	-	-	-	-	-	-	2	-
All methods of movement:										
Electric utilities	861	-	-	-	-	-	-	-	-	-
Retail dealers	46	-	-	-	-	-	-	-	2	-
All others	947	-	-	-	-	-	-	-	-	-
All-rail, total	1,132	-	-	-	-	-	-	-	2	-
Electric utilities	861	-	-	-	-	-	-	-	-	-
Retail dealers	43	-	-	-	-	-	-	-	2	-
All others	228	-	-	-	-	-	-	-	-	-
Truck, total	122	-	-	-	-	-	-	-	-	-
Retail dealers	3	-	-	-	-	-	-	-	-	-
All others	119	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
Missouri, (continued)											
Tramway, conveyor, and private railroad, total	-	-	-	2/	-	-	-	-	-	-	-
Electric utilities	-	-	-	2/	-	-	-	-	-	-	-
North and South Dakota, total	-	-	-	-	-	3	-	254	-	3,117	-
All methods of movement:											
Electric utilities	-	-	-	-	-	-	-	200	-	2,418	-
Retail dealers	-	-	-	-	-	3	-	29	-	292	-
All others	-	-	-	-	-	-	-	25	-	407	-
All-rail, total	-	-	-	-	-	3	-	254	-	1,966	-
Electric utilities	-	-	-	-	-	-	-	200	-	1,327	-
Retail dealers	-	-	-	-	-	3	-	29	-	233	-
All others	-	-	-	-	-	-	-	25	-	406	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	-	-	-	-	-	-	2/ 1,151	-
Electric utilities	-	-	-	-	-	-	-	-	-	2/ 1,091	-
Retail dealers	-	-	-	-	-	-	-	-	-	59	-
All others	-	-	-	-	-	-	-	-	-	1	-
Tramway, conveyor, and private railroad, total	-	-	-	-	-	-	-	-	-	2/	-
Electric utilities	-	-	-	-	-	-	-	-	-	2/	-
Nebraska and Kansas, total	-	-	-	1,113	-	31	-	108	-	-	-
All methods of movement:											
Electric utilities	-	-	-	861	-	-	-	-	-	-	-
Retail dealers	-	-	-	10	-	31	-	3	-	-	-
All others	-	-	-	242	-	-	-	105	-	-	-
All-rail, total	-	-	-	991	-	31	-	108	-	-	-
Electric utilities	-	-	-	861	-	-	-	-	-	-	-
Retail dealers	-	-	-	7	-	31	-	3	-	-	-
All others	-	-	-	125	-	-	-	105	-	-	-
Truck, total	-	-	-	122	-	-	-	-	-	-	-
Retail dealers	-	-	-	3	-	-	-	-	-	-	-
All others	-	-	-	119	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 25
South Atlantic											
Delaware and Maryland, total	14,954	6,495	412	5,524	-	728	1,795	-	-	-	-
All methods of movement:											
Electric utilities	8,713	5,273	179	3,217	-	-	44	-	-	-	-
Coke and gas plants	5,395	790	197	2,019	-	660	1,727	-	-	-	-
Retail dealers	93	15	-	6	-	65	9	-	-	-	-
All others	755	417	36	282	-	5	15	-	-	-	-
All-rail, total	7,098	5,266	412	5,524	-	68	1,795	-	-	-	-
Electric utilities	5,876	4,181	179	3,217	-	-	44	-	-	-	-
Coke and gas plants	511	790	197	2,019	-	-	1,727	-	-	-	-
Retail dealers	78	-	-	6	-	65	9	-	-	-	-
All others	633	295	36	282	-	5	15	-	-	-	-
Tidewater, total	6,627				-	660		-	-	-	-
Electric utilities	1,745				-	-		-	-	-	-
Coke and gas plants	4,882				-	660		-	-	-	-
Truck, total	1,229	1,229	-	-	-	-	-	-	-	-	-
Electric utilities	1,092	1,092	-	-	-	-	-	-	-	-	-
Retail dealers	15	15	-	-	-	-	-	-	-	-	-
All others	122	122	-	-	-	-	-	-	-	-	-
District of Columbia, total	886	597	17	4	-	187	81	-	-	-	-
All methods of movement:											
Electric utilities	546	447	-	4	-	95	-	-	-	-	-
Retail dealers	89	-	-	-	-	89	-	-	-	-	-
All others	251	150	17	-	-	3	81	-	-	-	-
All-rail, total	886	597	17	4	-	187	81	-	-	-	-
Electric utilities	546	447	-	4	-	95	-	-	-	-	-
Retail dealers	89	-	-	-	-	89	-	-	-	-	-
All others	251	150	17	-	-	3	81	-	-	-	-
Virginia, total	14,854	56	-	-	-	1,896	12,992	-	-	-	-
All methods of movement:											
Electric utilities	8,896	-	-	-	-	811	8,085	-	-	-	-
Coke and gas plants	72	-	-	-	-	9	63	-	-	-	-
Retail dealers	735	17	-	-	-	288	448	-	-	-	-
All others	5,133	19	-	-	-	788	4,396	-	-	-	-
All-rail, total	14,600	15	-	-	-	1,751	12,834	-	-	-	-
Electric utilities	8,896	-	-	-	-	811	8,085	-	-	-	-
Coke and gas plants	72	-	-	-	-	9	63	-	-	-	-
Retail dealers	599	-	-	-	-	218	381	-	-	-	-
All others	5,033	15	-	-	-	713	4,305	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 25
Virginia, (continued)											
Truck, total	254	21	-	-	-	75	138	-	-	-	-
Retail dealers	154	17	-	-	-	70	67	-	-	-	-
All others	100	4	-	-	-	5	91	-	-	-	-
West Virginia, total	25,284	2,048	3,879	6,599	1,375	1,160	8,585	-	-	-	-
All methods of movement:											
Electric utilities	12,671	2,046	-	5,038	1,011	-	4,576	-	-	-	-
Coke and gas plants	4,885	-	3,468	278	-	752	387	-	-	-	-
Retail dealers	392	2	-	77	3	207	103	-	-	-	-
All others	5,296	-	411	1,006	361	201	3,317	-	-	-	-
All-rail, total	5,915	1,851	147	878	-	374	2,685	-	-	-	-
Electric utilities	2,487	1,829	-	155	-	-	503	-	-	-	-
Coke and gas plants	556	-	-		-	97		-	-	-	-
Retail dealers	259	2	-	723	-	180	2,182	-	-	-	-
All others	2,853	-	147		-	137		-	-	-	-
River and ex-river, total	12,366	-	3,468	1,885	827	699	5,489	-	-	-	-
Electric utilities	6,183	-	-	1,609	565	-	4,009	-	-	-	-
Coke and gas plants	4,497	-	3,468	-	-	695	334	-	-	-	-
Retail dealers	50	-	-	-	-	-	50	-	-	-	-
All others	1,636	-	-	274	262	4	1,116	-	-	-	-
Truck, total	4,963	217	264	3,638	548	87	209	-	-	-	-
Electric utilities	4,001	217	-	3,274	446	-	64	-	-	-	-
Coke and gas plants	32	-	-		-	-		-	-	-	-
Retail dealers	123	-	-	364	3	27	145	-	-	-	-
All others	807	-	264		99	60		-	-	-	-
Tramway, conveyor, and private railroad, total		-	-		-		-	-	-	-	-
Electric utilities		-	-		-		-	-	-	-	-
All others		-	-		-		-	-	-	-	-
North Carolina, total	17,515	10	-	-	-	1,009	16,496	-	-	-	-
All methods of movement:											
Electric utilities	14,349	-	-	-	-	882	13,467	-	-	-	-
Retail dealers	636	-	-	-	-	54	602	-	-	-	-
All others	2,530	10	-	-	-	93	2,427	-	-	-	-
All-rail, total	17,508	10	-	-	-	1,009	16,489	-	-	-	-
Electric utilities	14,349	-	-	-	-	882	13,467	-	-	-	-
Retail dealers	631	-	-	-	-	54	597	-	-	-	-
All others	2,528	10	-	-	-	93	2,425	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/										
		1	2	3 and 6	4	7	8	9	10	11	13	12 and 14 thru 23
North Carolina, (continued)												
Truck, total	7	-	-	-	-	-	7	-	-	-	-	-
Retail dealers	5	-	-	-	-	-	5	-	-	-	-	-
All others	2	-	-	-	-	-	2	-	-	-	-	-
South Carolina, total	5,554	-	-	-	-	30	5,524	-	-	-	-	-
All methods of movement:												
Electric utilities	3,877	-	-	-	-	19	3,858	-	-	-	-	-
Retail dealers	269	-	-	-	-	-	269	-	-	-	-	-
All others	1,408	-	-	-	-	11	1,397	-	-	-	-	-
All-rail, total	5,554	-	-	-	-	30	5,524	-	-	-	-	-
Electric utilities	3,877	-	-	-	-	19	3,858	-	-	-	-	-
Retail dealers	269	-	-	-	-	-	269	-	-	-	-	-
All others	1,408	-	-	-	-	11	1,397	-	-	-	-	-
Georgia and Florida, total	11,492	-	-	-	-	-	6,150	5,099	-	-	283	-
All methods of movement:												
Electric utilities	10,519	-	-	-	-	-	5,531	5,099	-	-	129	-
Retail dealers	177	-	-	-	-	-	170	-	-	-	T	-
All others	796	-	-	-	-	-	649	-	-	-	147	-
All-rail, total	7,229	-	-	-	-	-	6,150	796	-	-	283	-
Electric utilities	6,256	-	-	-	-	-	5,531	796	-	-	129	-
Retail dealers	177	-	-	-	-	-	170	-	-	-	T	-
All others	796	-	-	-	-	-	649	-	-	-	147	-
River and ex-river, total	4,265	-	-	-	-	-	-	4,265	-	-	-	-
Electric utilities	4,265	-	-	-	-	-	-	4,265	-	-	-	-
East South Central												
Kentucky, total	19,046	-	-	-	-	431	3,677	12,492	2,446	-	-	-
All methods of movement:												
Electric utilities	14,087	-	-	-	-	-	1,674	10,136	2,277	-	-	-
Coke and gas plants	1,958	-	-	-	-	383	1,381	194	-	-	-	-
Retail dealers	498	-	-	-	-	6	262	230	-	-	-	-
All others	2,503	-	-	-	-	42	360	1,932	169	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/										
		1	2	3 and 6	4	7	8	9	10	11	13	12 and 14 thru 23
Kentucky, (continued)												
All-rail, total	11,726	-	-	-	-	2/	431	2/ 5,577	2/ 7,306	2/ 2,446	-	-	-
Electric utilities	8,558	-	-	-	-		-	2/ 1,674	2/ 5,428	2/ 2,277	-	-	-
Coke and gas plants	685	-	-	-	-	2/	583	2/ 1,581	-	-	-	-	-
Retail dealers	390	-	-	-	-	2/	6	2/ 227	169	-	-	-	-
All others	2,113	-	-	-	-		42	2/ 295	2/ 1,709	169	-	-	-
River and ex-river, total	2,034	-	-	-	-	2/	-	2/ -	2/ -	2/ -	-	-	-
Electric utilities	841	-	-	-	-		-	2/ -	2/ -	2/ -	-	-	-
Coke and gas plants	1,079	-	-	-	-	2/	-	2/ -	-	-	-	-	-
Retail dealers	12	-	-	-	-	2/	-	2/ -	-	-	-	-	-
All others	102	-	-	-	-		-	2/ -	2/ -	-	-	-	-
Truck, total	5,286	-	-	-	-		-	100	5,186	-	-	-	-
Electric utilities	4,708	-	-	-	-		-	-	4,708	-	-	-	-
Coke and gas plants	194	-	-	-	-		-	-	194	-	-	-	-
Retail dealers	96	-	-	-	-		-	35	61	-	-	-	-
All others	288	-	-	-	-		-	65	223	-	-	-	-
Tennessee, total	18,185	-	-	-	-		102	9,809	7,296	92	-	886	-
All methods of movement:													
Electric utilities	14,777	-	-	-	-		-	7,665	6,375	46	-	691	-
Coke and gas plants	174	-	-	-	-		66	108	-	-	-	-	-
Retail dealers	555	-	-	-	-		-	405	106	-	-	44	-
All others	2,679	-	-	-	-		36	1,651	815	46	-	151	-
All-rail, total	12,029	-	-	-	-		102	8,196	2/ 7,289	46	-	2/ 648	-
Electric utilities	8,862	-	-	-	-		-	6,096	2/ 6,375	-	-	2/ 643	-
Coke and gas plants	174	-	-	-	-		66	108	-	-	-	-	-
Retail dealers	480	-	-	-	-		-	375	100	-	-	5	-
All others	2,513	-	-	-	-		36	1,617	814	46	-	-	-
River and ex-river, total	4,298	-	-	-	-		-	-	2/ -	46	-	2/ -	-
Electric utilities	4,298	-	-	-	-		-	-	2/ -	46	-	2/ -	-
Truck, total	1,858	-	-	-	-		-	1,613	7	-	-	238	-
Electric utilities	1,617	-	-	-	-		-	1,569	-	-	-	48	-
Retail dealers	75	-	-	-	-		-	30	6	-	-	39	-
All others	166	-	-	-	-		-	14	1	-	-	151	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Alabama and Mississippi, total	24,081	-	-	-	-	554	1,759	6,909	21	-
All methods of movement:										
Electric utilities	14,550	-	-	-	-	-	108	6,235	21	-
Coke and gas plants	7,952	-	-	-	-	377	1,503	-	-	-
Retail dealers	97	-	-	-	-	-	7	5	-	-
All others	1,502	-	-	-	-	177	141	669	-	-
All-rail, total	15,387	-	-	-	-	554	1,759	6,909	-	-
Electric utilities	6,987	-	-	-	-	-	108	6,235	-	-
Coke and gas plants	7,842	-	-	-	-	377	1,503	-	-	-
Retail dealers	69	-	-	-	-	-	7	5	-	-
All others	489	-	-	-	-	177	141	669	-	-
River and ex-river, total	7,058	-	-	-	-	-	-	-	21	-
Electric utilities	6,088	-	-	-	-	-	-	-	21	-
All others	970	-	-	-	-	-	-	-	-	-
Truck, total	1,636	-	-	-	-	-	-	-	-	-
Electric utilities	2,475	-	-	-	-	-	-	-	-	-
Coke and gas plants	90	-	-	-	-	-	-	-	-	-
Retail dealers	28	-	-	-	-	-	-	-	-	-
All others	43	-	-	-	-	-	-	-	-	-
Tramway, conveyor, and private railroad, total	4	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
West South Central										
Arkansas, Louisiana, Oklahoma, and Texas, total	955	-	-	-	-	48	227	17	5	-
All methods of movement:										
Coke and gas plants	822	-	-	-	-	48	227	-	-	-
Retail dealers	23	-	-	-	-	-	-	4	5	-
All others	110	-	-	-	-	-	-	13	-	-
All-rail, total	691	-	-	-	-	48	227	17	5	-
Coke and gas plants	567	-	-	-	-	48	227	-	-	-
Retail dealers	14	-	-	-	-	-	-	4	5	-
All others	110	-	-	-	-	-	-	13	-	-
River and ex-river, total	255	-	-	-	-	-	-	-	-	-
Coke and gas plants	255	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
Truck, total	9	-	-	-	-	-	-	-	-	-
Retail dealers	9	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Kan.-Tex.	16	17	18	19	20	21	22&23
Alabama and Mississippi, total (cont.)	-	14,858	-	-	-	-	-	-	-	-	-
All methods of movement:											
Electric utilities	-	8,186	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	6,052	-	-	-	-	-	-	-	-	-
Retail dealers	-	85	-	-	-	-	-	-	-	-	-
All others	-	515	-	-	-	-	-	-	-	-	-
All-rail, total	-	15,000	-	-	-	-	-	-	-	-	-
Electric utilities	-	6,711	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	5,960	-	-	-	-	-	-	-	-	-
Retail dealers	-	37	-	-	-	-	-	-	-	-	-
All others	-	472	-	-	-	-	-	-	-	-	-
River and ex-river, total	-	W	-	-	-	-	-	-	-	-	-
Electric utilities	-	W	-	-	-	-	-	-	-	-	-
All others	-	W	-	-	-	-	-	-	-	-	-
Truck, total	-	1,656	-	-	-	-	-	-	-	-	-
Electric utilities	-	1,475	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	93	-	-	-	-	-	-	-	-	-
Retail dealers	-	28	-	-	-	-	-	-	-	-	-
All others	-	43	-	-	-	-	-	-	-	-	-
Tramway, conveyor, and private railroad, total	-	W	-	-	-	-	-	-	-	-	-
Electric utilities	-	W	-	-	-	-	-	-	-	-	-
West South Central											
Arkansas, Louisiana, Oklahoma, and Texas, total	-	84	435	139	-	-	-	-	-	-	-
All methods of movement:											
Coke and gas plants	-		435		-	-	-	-	-	-	-
Retail dealers	-	84	-	139	-	-	-	-	-	-	-
All others	-		-		-	-	-	-	-	-	-
All-rail, total	-	84	435	130	-	-	-	-	-	-	-
Coke and gas plants	-		435		-	-	-	-	-	-	-
Retail dealers	-	84	-	130	-	-	-	-	-	-	-
All others	-		-		-	-	-	-	-	-	-
River and ex-river, total	-	W	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	W	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	9	-	-	-	-	-	-	-
Retail dealers	-	-	-	9	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Mountain										
Colorado, total	4,720	-	-	-	-	-	-	-	-	-
All methods of movement:										
Electric utilities	2,919	-	-	-	-	-	-	-	-	-
Coke and gas plants	1,057	-	-	-	-	-	-	-	-	-
Retail dealers	289	-	-	-	-	-	-	-	-	-
All others	455	-	-	-	-	-	-	-	-	-
All-rail, total	3,514	-	-	-	-	-	-	-	-	-
Electric utilities	1,945	-	-	-	-	-	-	-	-	-
Coke and gas plants	1,057	-	-	-	-	-	-	-	-	-
Retail dealers	103	-	-	-	-	-	-	-	-	-
All others	409	-	-	-	-	-	-	-	-	-
Truck, total	1,206	-	-	-	-	-	-	-	-	-
Electric utilities	974	-	-	-	-	-	-	-	-	-
Retail dealers	186	-	-	-	-	-	-	-	-	-
All others	46	-	-	-	-	-	-	-	-	-
Tramway, conveyor, and private railroad, total	W	-	-	-	-	-	-	-	-	-
Electric utilities	W	-	-	-	-	-	-	-	-	-
Utah, total	2,853	-	-	-	-	-	-	-	-	-
All methods of movement:										
Electric utilities	479	-	-	-	-	-	-	-	-	-
Coke and gas plants	1,865	-	-	-	-	-	-	-	-	-
Retail dealers	193	-	-	-	-	-	-	-	-	-
All others	316	-	-	-	-	-	-	-	-	-
All-rail, total	2,273	-	-	-	-	-	-	-	-	-
Electric utilities	107	-	-	-	-	-	-	-	-	-
Coke and gas plants	1,865	-	-	-	-	-	-	-	-	-
Retail dealers	85	-	-	-	-	-	-	-	-	-
All others	218	-	-	-	-	-	-	-	-	-
Truck, total	578	-	-	-	-	-	-	-	-	-
Electric utilities	372	-	-	-	-	-	-	-	-	-
Retail dealers	108	-	-	-	-	-	-	-	-	-
All others	98	-	-	-	-	-	-	-	-	-
Tramway, conveyor, and private railroad, total	W	-	-	-	-	-	-	-	-	-
Electric utilities	W	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
Mountain (continued)											
Colorado, total	-	-	-	-	669	3,696	-	595	-	-	-
All methods of movement:											
Electric utilities	-	-	-	-	549	2,040	-	550	-	-	-
Coke and gas plants	-	-	-	-	-	1,057	-	-	-	-	-
Retail dealers	-	-	-	-	45	266	-	-	-	-	-
All others	-	-	-	-	77	313	-	65	-	-	-
All-rail, total	-	-	-	-	437	2,682	-	595	-	-	-
Electric utilities	-	-	-	-	398	1,217	-	530	-	-	-
Coke and gas plants	-	-	-	-	-	1,057	-	-	-	-	-
Retail dealers	-	-	-	-	-	105	-	-	-	-	-
All others	-	-	-	-	39	305	-	65	-	-	-
Truck, total	-	-	-	-	232	974	-	-	-	-	-
Electric utilities	-	-	-	-	151	823	-	-	-	-	-
Retail dealers	-	-	-	-	45	143	-	-	-	-	-
All others	-	-	-	-	36	8	-	-	-	-	-
Tramway, conveyor, and private railroad, total	-	-	-	-	-	W	-	-	-	-	-
Electric utilities	-	-	-	-	-	W	-	-	-	-	-
Utah, total	-	-	-	-	-	1,006	-	115	1,734	-	-
All methods of movement:											
Electric utilities	-	-	-	-	-	1,006	-	-	1,358	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	192	-	-
Retail dealers	-	-	-	-	-	-	-	3	204	-	-
All others	-	-	-	-	-	-	-	112		-	-
All-rail, total	-	-	-	-	-	1,006	-	115	1,156	-	-
Electric utilities	-	-	-	-	-	1,006	-	-	966	-	-
Coke and gas plants	-	-	-	-	-	-	-	-		-	-
Retail dealers	-	-	-	-	-	-	-	1	84	-	-
All others	-	-	-	-	-	-	-	112	106	-	-
Truck, total	-	-	-	-	-	-	-	-	W	-	-
Electric utilities	-	-	-	-	-	-	-	-	W	-	-
Retail dealers	-	-	-	-	-	-	-	-	108	-	-
All others	-	-	-	-	-	-	-	-	98	-	-
Tramway, conveyor, and private railroad, total	-	-	-	-	-	-	-	-	W	-	-
Electric utilities	-	-	-	-	-	-	-	-	W	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/											
		1 thru 11	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
Montana and Idaho, total	968	-	-	-	-	-	-	-	-	172	427	-	369
All methods of movement:													
Electric utilities	328	-	-	-	-	-	-	-	-	-	-	-	328
Retail dealers	427	-	-	-	-	-	-	-	-	30	377	-	20
All others	213	-	-	-	-	-	-	-	-	142	50	-	21
All-rail, total	878	-	-	-	-	-	-	-	-	172	371	-	335
Electric utilities	327	-	-	-	-	-	-	-	-	-	-	-	327
Retail dealers	353	-	-	-	-	-	-	-	-	30	321	-	2
All others	198	-	-	-	-	-	-	-	-	142	50	-	6
Truck, total	90	-	-	-	-	-	-	-	-	-	56	-	34
Electric utilities	1	-	-	-	-	-	-	-	-	-	-	-	1
Retail dealers	74	-	-	-	-	-	-	-	-	-	56	-	18
All others	15	-	-	-	-	-	-	-	-	-	-	-	15
Wyoming, total	2,491	-	-	-	-	-	-	3	-	2,491	-	-	-
All methods of movement:													
Electric utilities	2,891	-	-	-	-	-	-	-	-	2,891	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	88	-	-	-	-	-	-	3	-	85	-	-	-
All others	175	-	-	-	-	-	-	-	-	175	-	-	-
All-rail, total	446	-	-	-	-	-	-	3	-	443	-	-	-
Electric utilities	258	-	-	-	-	-	-	-	-	258	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	28	-	-	-	-	-	-	3	-	25	-	-	-
All others	160	-	-	-	-	-	-	-	-	160	-	-	-
Truck, total	W 2,048	-	-	-	-	-	-	-	-	W 2,048	-	-	-
Electric utilities	W 2,033	-	-	-	-	-	-	-	-	W 2,033	-	-	-
All others	15	-	-	-	-	-	-	-	-	15	-	-	-
Tramway, conveyor, and private railroad, total	W	-	-	-	-	-	-	-	-	W	-	-	-
Electric utilities	W	-	-	-	-	-	-	-	-	W	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/											
		1 thru 11	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
New Mexico, total	2,526	-	-	-	-	-	-	-	2,526	-	-	-	-
All methods of movement:													
Electric utilities	2,504	-	-	-	-	-	-	-	2,504	-	-	-	-
Retail dealers	5	-	-	-	-	-	-	-	5	-	-	-	-
All others	17	-	-	-	-	-	-	-	17	-	-	-	-
All-rail, total	-	-	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-	-	-
Truck, total	2,526	-	-	-	-	-	-	-	2,526	-	-	-	-
Electric utilities	2,504	-	-	-	-	-	-	-	2,504	-	-	-	-
Retail dealers	5	-	-	-	-	-	-	-	5	-	-	-	-
All others	17	-	-	-	-	-	-	-	17	-	-	-	-
Arizona and Nevada, total	700	-	-	-	-	-	-	-	368	-	332	-	-
All methods of movement:													
Electric utilities	661	-	-	-	-	-	-	-	356	-	305	-	-
Retail dealers	25	-	-	-	-	-	-	-	-	-	25	-	-
All others	14	-	-	-	-	-	-	-	12	-	2	-	-
All-rail, total	700	-	-	-	-	-	-	-	368	-	332	-	-
Electric utilities	661	-	-	-	-	-	-	-	356	-	305	-	-
Retail dealers	25	-	-	-	-	-	-	-	-	-	25	-	-
All others	14	-	-	-	-	-	-	-	12	-	2	-	-
Pacific													
Washington and Oregon, total	541	-	-	-	-	-	-	4	-	22	456	-	59
All methods of movement:													
Retail dealers	191	-	-	-	-	-	-	4	-	22	149	-	16
All others	350	-	-	-	-	-	-	-	-	-	307	-	43
All-rail, total	505	-	-	-	-	-	-	4	-	22	456	-	21
Retail dealers	171	-	-	-	-	-	-	4	-	22	149	-	-
All others	334	-	-	-	-	-	-	-	-	-	307	-	21
Truck, total	36	-	-	-	-	-	-	-	-	-	-	-	36
Retail dealers	16	-	-	-	-	-	-	-	-	-	-	-	16
All others	22	-	-	-	-	-	-	-	-	-	-	-	22

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
California, total	2,051	-	-	-	-	175	-	-	-	-
All methods of movement:										
Coke and gas plants	2,017	-	-	-	-		-	-	-	-
Retail dealers	14	-	-	-	-	175	-	-	-	-
All others	20	-	-	-	-		-	-	-	-
All-rail, total	2,051	-	-	-	-	175	-	-	-	-
Coke and gas plants	2,017	-	-	-	-		-	-	-	-
Retail dealers	14	-	-	-	-	175	-	-	-	-
All others	20	-	-	-	-		-	-	-	-
Alaska, total	952	-	-	-	-	-	-	-	-	-
All methods of movement:										
Electric utilities	135	-	-	-	-	-	-	-	-	-
Retail dealers	43	-	-	-	-	-	-	-	-	-
All others	774	-	-	-	-	-	-	-	-	-
All-rail, total	944	-	-	-	-	-	-	-	-	-
Electric utilities	135	-	-	-	-	-	-	-	-	-
Retail dealers	43	-	-	-	-	-	-	-	-	-
All others	766	-	-	-	-	-	-	-	-	-
Truck, total	8	-	-	-	-	-	-	-	-	-
All others	8	-	-	-	-	-	-	-	-	-
Canada, total	14,856	549	1,806	4,140	444	1,137	6,715	57	-	8
All methods of movement:										
Electric utilities	4,932	12	1,659	3,469	3	-	38	-	-	-
Coke and gas plants	5,513	-			-	1,047	4,219	-	-	-
Retail dealers	442	-	-	673	439	24	249	-	-	-
All others	3,969	534	147			66	2,209	57	-	8
All-rail, total	608	60	2	94	20	41	391	-	-	-
Electric utilities	13	12	-	2	-	-	-	-	-	-
Coke and gas plants	278	-	-	4	-	-	274	-	-	-
Retail dealers	101	-	-							
All others	216	45	2	89	20	12	45	-	-	-
						29	72	-	-	-
Great Lakes, total	14,248	489	1,804	4,046	424	1,096	6,584	57	-	8
Electric utilities	4,919	-	1,659	3,460	3	-	38	-	-	-
Coke and gas plants	5,235	-			-	1,047	5,943	-	-	-
Retail dealers	341	-	-	586	419	12	204	-	-	-
All others	3,753	489	145			37	2,137	57	-	8
Tidewater, total	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
California, total (continued)	-	-	-	-	-	815	4	-	1,059	-	-
All methods of movement:											
Coke and gas plants	-	-	-	-	-	815	-	-	1,059	-	-
Retail dealers	-	-	-	-	-		-	-		-	-
All others	-	-	-	-	-		4	-		-	-
All-rail, total	-	-	-	-	-	815	4	-	1,059	-	-
Coke and gas plants	-	-	-	-	-	815	-	-	1,059	-	-
Retail dealers	-	-	-	-	-		-	-		-	-
All others	-	-	-	-	-		4	-		-	-
Alaska, total	-	-	-	-	-	-	-	-	-	-	952
All methods of movement:											
Electric utilities	-	-	-	-	-	-	-	-	-	-	135
Retail dealers	-	-	-	-	-	-	-	-	-	-	43
All others	-	-	-	-	-	-	-	-	-	-	774
All-rail, total	-	-	-	-	-	-	-	-	-	-	944
Electric utilities	-	-	-	-	-	-	-	-	-	-	135
Retail dealers	-	-	-	-	-	-	-	-	-	-	43
All others	-	-	-	-	-	-	-	-	-	-	766
Truck, total	-	-	-	-	-	-	-	-	-	-	8
All others	-	-	-	-	-	-	-	-	-	-	8
Canada, total	-	-	-	-	-	-	-	-	-	-	-
All methods of movement:											
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Tidewater, total	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

1447

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Mexico, total	62	-	-	-	-	-	-	-	-	-
All methods of movement:										
All others	62	-	-	-	-	-	-	-	-	-
All-rail, total	62	-	-	-	-	-	-	-	-	-
All others	62	-	-	-	-	-	-	-	-	-
Destinations Not Revealable	994	107	89	75	18	121	234	21	123	169
All methods of movement:										
Electric utilities	487	66	32	32	1				99	154
Coke and gas plants	160	10	42	35	-	121	234	21	-	-
Retail dealers	49	4	2	1	8				4	7
All others	298	27	13	7	9				20	8
All-rail, total	440	19	30	5	3	111	183	2	4	30
Electric utilities	190	-	16	2	-				-	30
Coke and gas plants	65	10	-	-	-				-	-
Retail dealers	23	3	1	1	2	111	183	2	-	-
All others	202	6	13	2	1				4	-
River and ex-river, total	283	-	-	35	14	10	10	8	99	104
Electric utilities	207	-	-	-	-		-		99	104
Coke and gas plants	38	-	-	35	-	10	-	8	-	-
Retail dealers	6	-	-	-	6		-		-	-
All others	32	-	-	-	8		10		-	-
Great Lakes, total	157	67	-	30	1	-	12	11	1	15
Electric utilities	86	50	-	30	1	-	5	-	-	-
Coke and gas plants	7	-	-	-	-	-	-	-	-	-
Retail dealers	18	-	-	-	-	-	7	-	-	-
All others	26	17	-	-	-	-	-	11	-	7
								-	1	8
Tidewater, total	105	19	53	4	-	-	29	-	-	-
Electric utilities	44	16	16	-	-	-	12	-	-	-
Coke and gas plants	45	-	37	-	-	-	8	-	-	-
Retail dealers	1	1	-	-	-	-	-	-	-	-
All others	15	2	-	4	-	-	9	-	-	-
Truck, total	29	2	6	1	-	-	-	-	19	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	5	-	5	-	-	-	-	-	-	-
Retail dealers	1	-	1	-	-	-	-	-	-	-
All others	23	2	-	1	-	-	-	-	19	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
Mexico, total (continued)	-	-	62	-	-	-	-	-	-	-	-
All methods of movement:											
All others	-	-	62	-	-	-	-	-	-	-	-
All-rail, total	-	-	62	-	-	-	-	-	-	-	-
All others	-	-	62	-	-	-	-	-	-	-	-
Destinations Not Revealable	-	3	-	-	-	1	1	31	-	1	-
All methods of movement:											
Electric utilities	-	-	-	-	-	-	-	27	-	-	-
Coke and gas plants	-	3	-	-	-	1	-	4	-	1	-
Retail dealers	-	-	-	-	-	-	1	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	-	-	1	-	31	-	1	-
Electric utilities	-	-	-	-	-	-	-	27	-	-	-
Coke and gas plants	-	-	-	-	-	1	-	4	-	1	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
River and ex-river, total	-	3	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	3	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Tidewater, total	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	-	-	-	1	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	1	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/								
		1	2	3 and 6	4	7	8	9	10	11
Destination and/or Consumer Uses Not Available										
Great Lakes movement:										
Canadian commercial docks	368	15	77	96	59	3	118	-	-	-
Vessel fuel	878	2	518	35	42	-	472	3	4	-
U.S. dock storage	-62	-2	-15	92	-147	119	-86	16	-41	-
Tidewater movement:										
Overseas exports (except Canada)	34,174	1,339	-	714	-	15,708	16,413	-	-	-
Bunker fuel	5	-	-	1	-	-	4	-	-	-
U.S. dock storage	-	-	-	-5	-	14	-9	-	-	-
Railroad fuel, total	1,179	191	3	40	159	151	233	52	160	115
All methods of movement:										
United States companies	1,146	191	3	40	126	151	233	52	160	115
Canadian companies	33	-	-	-	33	-	-	-	-	-
Coal used at mines and sales to employees	1,678	455	24	20	32	628	396	-	45	9
Net change in mine inventory	663	68	-41	62	140	441	-89	33	-42	16

TABLE I - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/										
	12	13	14	15 Excl.Tex.	16	17	18	19	20	21	22&23
Destination and/or Consumer Uses Not Available (continued)											
Great Lakes movement:											
Canadian commercial docks	-	-	-	-	-	-	-	-	-	-	-
Vessel fuel	-	-	-	-	-	-	-	-	-	-	-
U.S. dock storage	-	-	-	-	-	-	-	-	-	-	-
Tidewater movement:											
Overseas exports (except Canada)	-	-	-	-	-	-	-	-	-	-	-
Bunker fuel	-	-	-	-	-	-	-	-	-	-	-
U.S. dock storage	-	-	-	-	-	-	-	-	-	-	-
Railroad fuel, total	-	-	-	2	-	-	-	31	3	36	3
All methods of movement:											
United States companies	-	-	-	2	-	-	-	31	3	36	3
Canadian companies	-	-	-	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	-	2	-	-	4	2	-	2	31	24	4
Net change in mine inventory	-	-5	-	-26	2	21	-7	-	18	74	-

FOOTNOTES (Where special combinations of consumer uses, methods of movement, States of destinations, etc., are shown in footnotes, it is for purposes of concealment of individual respondent figures)

1/ For definitions of bituminous coal and lignite producing districts, see page 3.
2/ Excludes shipments to Canadian Great Lakes commercial docks and United States dock storage for which consumer uses are not available; however, includes vessel fuel, the destinations of which are not available.
3/ Excludes overseas exports and United States tidewater dock storage for which consumer uses are not available; however, includes bunker fuel, the destinations of which are not available.
4/ Shipments via tramway, conveyor, and private railroad are included with truck shipments.
5/ Shipments via river and ex-river are included with all-rail shipments.
6/ Shipments via tidewater are included with all-rail shipments.
7/ Shipments via Great Lakes are included with all-rail shipments.

TABLE II - COMPARATIVE SUMMARY OF DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEARS OF 1967 AND 1966, BY GEOGRAPHIC DIVISION AND STATE DESTINATION, METHOD OF MOVEMENT, AND CONSUMER USE.

(In Thousand Net Tons of 2,000 Pounds)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL Calendar Year		ELECTRIC UTILITIES Calendar Year		COKE AND GAS PLANTS Calendar Year		RETAIL DEALERS Calendar Year		ALL OTHERS Calendar Year	
	1967	1966	1967	1966	1967	1966	1967	1966	1967	1966
Shipments to all destinations in United States, Canada, and Mexico, by all methods of movement and consumer use, and overseas exports, total	552,647	532,366	296,177	271,616	99,786	100,570	18,789	20,664	1/ 99,895	1/ 101,866
Railroad fuel	1,179	1,308	-	-	-	-	-	-	-	-
Canadian Great Lakes commercial docks (consumer use not available)	368	428	-	-	-	-	-	-	-	-
U.S. Great Lakes dock storage (consumer use not available)	-62	-6	-	-	-	-	-	-	-	-
U.S. tidewater dock storage (consumer use not available)	-	4	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	1,678	2,098	-	-	-	-	-	-	-	-
Net change in mine inventory	663	291	-	-	-	-	-	-	-	-
Overseas exports (excludes Canada - consumer use not available)	34,174	33,527	-	-	-	-	-	-	-	-
Shipments to all destinations in United States, Canada, and Mexico, by specific method of movement and consumer use (excludes railroad fuel, Canadian Great Lakes commercial docks, U.S. Great Lakes and tidewater dock storage, coal used at mines and sales to employees, net change in inventory, and overseas exports)										
All-rail	276,800	262,678	152,940	136,466	50,951	49,685	10,984	12,637	61,925	63,890
River and ex-river	99,396	92,791	63,296	56,785	27,959	28,077	1,245	851	6,896	7,078
Great Lakes 2/	53,078	55,305	23,947	23,584	13,456	15,274	3,173	3,520	12,502	13,127
Tidewater 3/	21,370	23,080	14,527	16,243	6,266	6,122	4	21	573	694
Truck	47,597	45,601	25,119	23,553	1,154	1,412	3,383	3,635	17,941	17,001
Tramway, conveyor, and private railroad	16,406	15,261	16,348	15,185	-	-	-	-	58	76

TABLE II - COMPARATIVE SUMMARY OF DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEARS OF 1967 AND 1966 (continued) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL Calendar Year		ELECTRIC UTILITIES Calendar Year		COKE AND GAS PLANTS Calendar Year		RETAIL DEALERS Calendar Year		ALL OTHERS Calendar Year	
	1967	1966	1967	1966	1967	1966	1967	1966	1967	1966
New England, total	9,741	10,877	8,167	9,458	483	454	164	186	927	779
Massachusetts	4,022	4,415	3,418	4,019	-	-	110	109	494	287
Connecticut	4,795	5,434	4,030	4,675	483	454	12	12	268	293
Maine, New Hampshire, Vermont and Rhode Island	926	1,028	719	764	-	-	42	65	165	199
Middle Atlantic, total	96,362	93,913	44,508	42,037	33,859	33,500	961	1,093	17,234	17,283
New York	27,300	25,514	14,550	12,487	5,980	5,882	165	260	6,825	6,685
New Jersey	7,865	8,692	6,405	7,151	490	511	15	16	957	1,014
Pennsylvania	61,197	59,707	23,595	22,399	27,389	27,107	781	817	9,452	9,584
East North Central, total	196,417	192,251	108,170	100,780	32,468	33,577	10,734	11,702	45,045	46,192
Ohio	58,726	57,682	30,086	28,321	11,610	12,230	2,191	2,330	14,839	14,741
Indiana	40,441	38,424	20,684	18,600	12,321	12,246	1,070	1,165	6,426	6,415
Illinois	46,710	46,582	29,497	27,808	5,449	5,626	4,074	4,265	9,690	10,685
Michigan	34,959	34,770	19,605	18,464	4,591	5,012	1,485	1,831	9,278	9,463
Wisconsin	15,581	15,053	8,358	7,587	497	463	1,914	2,115	4,812	4,888
West North Central, total	26,761	25,977	177,791	16,454	1,158	1,161	1,642	1,889	6,180	6,473
Minnesota	7,142	7,680	4,137	4,624	989	952	685	712	1,391	1,392
Iowa	5,549	5,440	3,227	2,915	-	-	355	442	1,967	2,083
Missouri	9,389	8,494	6,944	5,946	219	209	189	277	2,037	2,062
North Dakota and South Dakota	3,487	2,996	2,622	2,173	-	-	367	398	498	425
Nebraska and Kansas	1,254	1,367	861	796	-	-	46	60	347	511
South Atlantic, total	88,499	80,491	59,571	51,507	10,350	10,420	2,409	2,508	16,169	16,056
Delaware and Maryland	14,954	14,082	8,713	8,108	5,393	4,967	93	111	755	896
District of Columbia	[y] 886	[y] 897	546	497	-	-	89	101	[y] 251	[y] 299
Virginia	14,854	14,279	8,896	8,245	72	260	753	831	5,133	4,943
West Virginia	23,244	20,159	12,671	9,594	4,885	5,193	392	307	5,296	5,065
North Carolina	17,515	15,352	14,349	12,226	-	-	636	639	2,530	2,487
South Carolina	5,554	5,118	3,877	3,240	-	-	269	296	1,408	1,582
Georgia and Florida	11,492	10,604	10,519	9,597	-	-	177	225	796	784
East South Central, total	61,512	54,929	45,414	37,668	10,064	9,342	1,150	1,264	6,684	6,655
Kentucky	19,046	17,644	14,087	12,693	1,958	1,751	498	552	2,503	2,648
Tennessee	18,185	14,811	14,777	11,427	174	180	555	606	2,679	2,596
Alabama and Mississippi	24,081	22,474	14,550	13,548	7,932	7,411	97	104	1,502	1,411
West South Central, total	955	1,084	-	-	822	948	23	28	110	108
Arkansas, Louisiana, Oklahoma & Texas	955	1,084	-	-	822	948	23	28	110	108

TABLE II - COMPARATIVE SUMMARY OF DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEARS OF 1967 AND 1966 (continued) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL Calendar Year		ELECTRIC UTILITIES Calendar Year		COKE AND GAS PLANTS Calendar Year		RETAIL DEALERS Calendar Year		ALL OTHERS Calendar Year	
	1967	1966	1967	1966	1967	1966	1967	1966	1967	1966
Mountain, total	14,861	14,098	9,182	8,694	2,982	3,163	967	1,044	1,190	1,197
Colorado	4,780	4,705	2,919	2,758	1,097	1,252	289	343	455	372
Utah	2,853	2,974	479	486	1,865	1,951	193	186	316	371
Montana and Idaho	968	995	388	395	-	-	427	377	213	293
Wyoming	2,494	2,601	2,291	2,437	-	-	28	39	175	125
New Mexico	2,586	2,084	2,504	2,064	-	-	5	7	17	15
Arizona and Nevada	700	739	661	624	-	-	25	92	14	25
Pacific, total	2,592	2,575	-	-	2,017	1,899	205	268	370	468
Washington and Oregon	541	687	-	-	-	-	191	254	350	433
California	2,051	1,888	-	-	2,017	1,899	14	14	20	35
Alaska	952	858	135	204	-	-	43	44	774	610
Canada 5/	14,856	15,331	4,952	4,506	5,513	5,854	442	558	3,969	4,413
Mexico	62	54	-	-	-	-	-	-	62	54
Destinations Not Revealable	994	1,211	487	308	160	312	49	80	298	511
Destinations and/or Consumer Uses Not Available										
Great Lakes movement:										
Canadian commercial docks	368	408	-	-	-	-	-	-	-	-
Vessel fuel	878	1,054	-	-	-	-	-	-	-	-
U.S. dock storage	-62	-6	-	-	-	-	-	-	-	-
Tidewater movement:										
Overseas exports (except Canada)	54,174	55,587	-	-	-	-	-	-	-	-
Bunker fuel	5	15	-	-	-	-	-	-	-	-
U.S. dock storage	-	4	-	-	-	-	-	-	-	-
Railroad fuel, total	1,179	1,308	-	-	-	-	-	-	-	-
All methods of movement:										
United States companies	1,146	1,260	-	-	-	-	-	-	-	-
Canadian companies	33	48	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	1,678	2,098	-	-	-	-	-	-	-	-
Net change in mine inventory	663	291	-	-	-	-	-	-	-	-

FOOTNOTE: (Where special combinations of consumer uses, methods of movement, States of destination, etc., are shown in footnotes, it is for purposes of concealment of individual respondent figures.)

1/ Includes vessel fuel and bunker fuel, the destinations of which are not available.

2/ Excludes shipments to Canadian Great Lakes commercial docks and United States dock storage for which consumer uses are not available; however, includes vessel fuel, the destinations of which are not available.

3/ Excludes overseas exports and United States tidewater dock storage for which consumer uses are not available; however, includes bunker fuel, the destinations of which are not available.

4/ A considerable block of tonnage is included under "Destinations Not Revealable."

5/ Excludes shipments to Canadian Great Lakes commercial docks and Canadian railroad companies.

1455

89TH CONGRESS
2d Session
SENATE
DOCUMENT
No. 78

Griswold Dep Ex 3
5/19/67

AIR POLLUTION BY FEDERAL FACILITIES

REPORT

OF THE

SECRETARY OF HEALTH, EDUCATION, AND WELFARE

TO THE

CONGRESS OF THE UNITED STATES

IN COMPLIANCE WITH

PUBLIC LAW 90-148

THE CLEAN AIR ACT, AS AMENDED

JANUARY 1968

APRIL 1, 1968.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
92-098 WASHINGTON : 1968

SENATE RESOLUTION 261

Submitted by Mr. Randolph of West Virginia

IN THE SENATE OF THE UNITED STATES.

Agreed to April 1, 1968.

Resolved, That there be printed as a Senate document the report of the Secretary of Health, Education, and Welfare, entitled "Air Pollution by Federal Facilities", in compliance with the provisions of title I, section 111(b) of the Clean Air Act, Public Law 90-148, as amended; and that there be printed 2,500 additional copies of such document for the use of the Committee on Public Works.

Attest:

FRANCIS R. VALEO,
Secretary.

By DARRELL ST. CLAIRE,
Chief Clerk.

LETTER OF TRANSMITTAL

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE,
Washington, D.C., February 7, 1968.

Hon. HUBERT H. HUMPHREY,
President, U.S. Senate,
Washington, D.C.

DEAR MR. PRESIDENT: In accordance with the provisions of title I, section 111(b) of the Clean Air Act, Public Law 90-148, as amended, there is transmitted herewith a report on measures being taken to control the emission of air pollutants from Federal facilities.

Sincerely,

WILBUR J. COHEN,
Acting Secretary.

AIR POLLUTION BY FEDERAL FACILITIES

INTRODUCTION

The Clean Air Act, as amended, emphasizes the need for Federal leadership and assistance to State and local agencies in the control of air pollution. In addition, the act indicates that the Federal agencies shall cooperate with the Department of Health, Education, and Welfare and with any air pollution control agency in preventing and controlling air pollution from the facilities for which they are responsible. It also provides for the establishment of classes of air pollution sources for which limited permits could be issued and further requires the Secretary to submit an annual report to the Congress on the status of such permits and compliance therewith. The language of the act is such that the Secretary is given discretion with respect to the classification and permit procedure to be established.

In addition to the act mentioned above, the program of abatement and control of air pollution from Federal facilities is governed by Executive Order 11282, dated May 26, 1966, entitled "Control of Pollution Originating from Federal Installations," by the "Performance Standards and Techniques of Measurement" prescribed by the Secretary of Department of Health, Education, and Welfare, issued June 2, 1966, in response to "Sec. 5 Standards" of Executive Order 11282 and by Bureau of the Budget Circular No. A-78 issued on August 6, 1966, and sent to the heads of executive departments and establishments.

It is expected that several years effort will be required to fully control air pollutant emissions from Federal establishments in accordance with the best current practices. To provide the necessary technical guidance for this overall effort, the National Center for Air Pollution Control of this Department has established a Federal Facilities Section, the staff of which will devote full time to the surveillance of air pollution problems arising from Federal activities, the extension of technical assistance to other agencies and departments, and to studies of the scheduling of the necessary improvements in control of the emissions at Federal establishments.

ACCOMPLISHMENTS

The Performance Standards accompanying Executive Order 11282, through section 76.5(c)(1), called for the Secretary of the Department of Health, Education, and Welfare to establish by regulation limits on the emission of sulfur oxides to the atmosphere from Federal facilities within 6 months of the effective date of the standards for standard metropolitan statistical areas or standard consolidated areas which have a population exceeding 2 million and a population density exceeding 15,000 persons per square mile. The result of this require-

ment, which pertains only to the New York, Chicago, and Philadelphia metropolitan areas, was the preparation and publication in the November 22, 1966, issue of the Federal Register of a notice of intention to adopt—30 days after the publication of the notice—specific limits on the emission of sulfur oxides in these three areas. The 30-day effective time limit was extended by the Secretary of the Department of Health, Education, and Welfare for an additional 90 days at the request of an industrial trade association which was concerned about the impact of the proposed regulations on certain segments of the fossil fuel industry. The proposed limits were published in final form in the March 23, 1967, issue of the Federal Register to be effective October 1, 1968.

The limitations on sulfur oxide emissions for Federal facilities in these three heavily polluted areas are sufficiently stringent to cause serious concern and attention. Information received indicates that all agencies intend to comply with the regulations as rapidly as possible. This compliance is related closely to the efforts of the air pollution control agencies in these cities to relieve their population of excessively high exposure to sulfur oxides and is an excellent example of cooperation by Federal agencies with local authorities.

During 1967, a number of studies of special Federal problems of air pollution and its control have been undertaken. Both the General Services Administration and the Department of Defense began studies of problems associated with fuel supply nationally and with specific emphasis on New York, Philadelphia, and Chicago. The Department of Defense initiated a program of testing fuel oil for its sulfur content since the current military and Federal specifications on fuel oil permit sulfur contents which are considerably in excess of that associated with current and anticipated limits. Several directives were issued to military commands to put this new program into effect immediately. Laboratory resources of the Department of Defense will be utilized for this program.

Toxic rocket propellants continued to be a problem during 1967. Potential beryllium emissions have been controlled, largely because of the Public Health Service policy statement on beryllium issued in 1966, and through the excellent cooperation by the two principal agencies concerned (DOD and National Aeronautics and Space Administration).

Interagency leadership resulted in preventing potential widespread atmospheric pollution with toxic chemicals under development for use in Federal missile and aerospace activities. Both the Department of Defense and the National Aeronautics and Space Administration took appropriate actions to insure compliance with recommended guidelines issued with the Public Health Service policy statement on beryllium.

The policy, based on recommendations of the National Academy of Science's Committee on Toxicology, maintains that, with present scientific information, prudence requires the assumption that all compounds of beryllium possess long-range toxicity for some humans. Therefore, no amount of beryllium should be deliberately emitted to the atmosphere, except under circumstances directly relevant to defense of the Nation.

New justification for the longstanding Federal concern about contamination of the ambient atmosphere, by even minute amounts of

beryllium arising from any activity of government, was provided by a recent court decision. In October 1967 a Pennsylvania jury awarded $109,120 to a 45-year-old mother on the ground that her serious lung disease was caused by beryllium fumes emitted to the atmosphere by an industrial plant located several miles from her residence. (*Heck v. Beryllium Corp.*, Berks County, Pennsylvania Court of Common Pleas.)

Although that court decision produced no change in the conservative Public Health Service policy toward control of beryllium, it did stimulate intensified activity within the Department of Defense to assure enforcement of the stringent guidelines issued earlier to control any rocket motor tests required by the national defense. It also stimulated serious reappraisal of the need for toxic rocket propellants, and this reappraisal was going on at year's end, when virtually all research and development involving beryllium as a propellant had stopped.

Activity also was continued in Chattanooga and Hamilton County, Tenn., because of continued interest of citizens of the area in general air pollution abatement, because of complaints concerning the emissions from the Volunteer Army Ammunition Plant in Hamilton County and because of technical problems involving efforts to control sulfur oxides, nitric oxides, sulfuric and nitric acid mists, red water incinerator wastes and other contaminants. The Abatement Program is studying the air pollution situation of the entire area and air pollution from the ammunition plant. The most significant recommendation made to the Office of the Surgeon General, Department of the Army, by the Public Health Service was to install catalytic reduction units at the plant to reduce markedly the emissions of nitric oxides to the atmosphere from the nitric acid plants at the Volunteer Army Ammunition Plant.

Special cooperation continues with the Tennessee Valley Authority through its Division of Health and Safety. In addition to participating in an advance review of TVA's phased and orderly plan prior to its submission to the Bureau of the Budget, the Federal Facilities Section and meteorological personnel of the abatement program also reviewed TVA's current plans to control air pollution from its new plant in Cumberland City, Tenn. This plant will burn a high-sulfur coal which is the most readily available fuel in the quantities needed and will have one or two 1,000 foot stacks equipped with highly efficient (99 percent) electrostatic precipitators to control particulate emissions, depending on final engineering design decisions. Although there is not considered to be a currently acceptable economic method of removing sulfur oxides from these stack gases. TVA recognizes that these oxides may be a problem and has provided for installation of control mechanisms in the future when they are developed. It should be noted here that considerable research is underway by the Public Health Service and TVA, by the Bureau of Mines of the Department of the Interior and by private utilities and chemical companies to develop technology to remove sulfur oxides from stack gases of powerplants.

Most of the activity by the Federal Facilities Section of the abatement program involved assistance to the departments and agencies in preparing their 5-year phased and orderly plan for the Bureau of

the Budget and, during the second half of 1967, in analysing these phased and orderly plans for the Bureau of the Budget. Fourteen departments and agencies prepared and submitted their plans for air pollution control improvements to the Bureau of the Budget by July 1, 1967; the Post Office Department plan was received December 26, 1967.

The agencies estimated a cost of approximately $18 million for air pollution abatement work scheduled for fiscal year 1968. In fiscal year 1969, the projects included in the approved plan are estimated to cost approximately $21 million.

The air pollution phased and orderly plan for the initial 14 departments and agencies submitting data to the Bureau of the Budget as called for by Executive Order 11282 covers proposed corrective actions for fiscal years 1969 through 1973 affecting approximately 435 projects.

The plan by agency breaks down as follows:

	Projects
Department of Defense	349
Veterans' Administration	26
Atomic Energy Commission	13
Tennessee Valley Authority	5
All other agencies	42
Total (all agencies)	435

The projects represent Federal facilities in 49 of the States, the District of Columbia and the Commonwealth of Puerto Rico. No projects were submitted from Delaware, the Virgin Islands, American Samoa or Guam. All of the projects are specifically concerned with abatement of air pollution. Some place in this plan are examples of all of the usual types of air pollution problems found among non-Federal activities across the country as well as unique problems associated with the production of munitions and hardware associated with our national defense. The details of these projects form the basis for a national inventory of Federal air pollution sources and needed corrective measures.

Projects were reported to the Bureau of the Budget on forms designed by that Bureau and these were reviewed by the Federal Facilities Section for the Bureau. In some cases, as necessary, further consultation was held with the departments or agencies concerned and minor amendments and corrections were made. In many cases, the cost estimates are based upon preliminary engineering and economic judgments and, before final decisions are made, may be modified to reflect new choices for corrective measures. For example, where lower sulfur fuels are necessary, final decisions concerning the use of coal, oil or natural gas will depend upon the economic picture at the time of purchase and upon the ready availability of an appropriate low-sulfur fuel at the site. Generally speaking, from an engineering and cost point of view, the plans presented acceptable proposals for abatement of air pollution and the Bureau of the Budget was so notified.

As might be expected, the agencies' proposals were directed principally at the reduction of sulfur oxide emissions, reduction of particulates by installation of high-efficiency separators and provision of improved methods of solid waste disposal through incineration or sanitary land-fill operations. Compliance with the strict sulfur oxide regulations governing facilities in New York, Philadelphia, and Chicago is receiving careful attention. Areas in the country where there

exists the actuality or probability of interstate air pollution also had high priority in these plans. Provision of flue gas scrubbers, smoke detectors, and alarms, submerged inlets for certain fuel storage units, installation of special incinerators for disposal of biological wastes, high-efficiency cyclones, absorption towers, mist eliminators, catalytic reduction units, waste shredders and wood hammer mills, are examples of other abatement devices needed for the projects.

At the request of the Bureau of the Budget, the Federal Facilities Section analyzed the 1969 portion of the 5-year phased and orderly plan and suggested to the Bureau a system of priorities through which the projects could be classified by financial quartiles. In establishing these priorities, consideration was given items such as complaints, violation of local air pollution codes, degree of seriousness of potential health hazard, location of the facility with special emphasis on interstate areas and interstate areas in which the Department of Health, Education, and Welfare had initiated formal abatement actions under the Clean Air Act of 1963, as amended. Attention also was called to projects on which abatement work has been started or scheduled in 1968 out of regularly appropriated funds of each agency.

The Federal Facilities Section, abatement program, was notified that the Bureau of the Budget approved for financing in 1969 all projects for facilities located in the New York City, Chicago, and Philadelphia metropolitan statistical areas, the Washington, D.C. metropolitan area, all projects where violation of local air pollution control regulations exist, where significant potential health hazards exist and all projects located in interstate areas where the Department of Health, Education, and Welfare has started air pollution abatement procedings under the Clean Air Act of 1963, as amended. A list of these projects received from the Bureau of the Budget, by agency and location, is found in appendix A.

The data submitted by the agencies in most cases included abatement projects on which work had been started or scheduled in 1968 fiscal year. Many of these projects are to be completed during that year but others require additional support in subsequent fiscal years. (A list of the projects scheduled to start in 1968 is found in app. B.) These corrective measures scheduled for 1968 cover 166 projects to be financed from regularly appropriated construction, operations, and repair or other moneys and represent a sizable contribution to air pollution control efforts by the Federal agencies. The projects scheduled for completion during 1968 for the most part solve relatively simple problems such as conversion to similar but lower sulfur fuels, installation of smoke detectors or provision of sanitary land-fills as a substitute for open burning of solid wastes. The Veterans' Administration and TVA are outstanding with respect to these planned projects as part of their regular operations, repair and maintenance activities. The Department of Defense also had an appreciable input.

Progress with respect to the abatement projects which are funded for fiscal year 1969 can be followed through the annual reports called for from each participating agency by Executive Order 11282 and Bureau of the Budget Circular No. A–78. The first of these reports is due on July 1, 1968 at the Bureau of the Budget.

Several agencies have problems of open burning of solid wastes which, although not reported in the phased and orderly plan, are

being studied by the agencies in cooperation with the Federal Facilities Section of the National center for Air Pollution Control and the solid wastes program of the National Center for Urban and Industrial Health of the Department of Health, Education, and Welfare. The results may indicate needs for further proposals for air pollution abatement as an extension of the plan in fiscal years 1969 or 1970.

The adoption of regulations for the control of organic solvents such as rule 66 of the Los Angeles County Air Pollution Control District and rule 3 of the San Francisco Bay Area Air Pollution Control District during 1967 also brings a need for several agencies to assess this problem as soon as possible. The Department of Defense already is active in this respect and all other agencies have been notified to review their operations in the Los Angeles and the San Francisco areas. There appears to be a need for uniformity with respect to these rules to prevent the adoption of different requirements in many different sections of the country. The National Center for Air Pollution Control currently is establishing an Advisory Committee on Organic Solvents to consider this matter further.

During December 1967, the Department of Health, Education, and Welfare called a conference under procedures of the Clean Air Act of 1963, as amended, to consider problems associated with interstate air pollution in the Washington, D.C., metropolitan area. As part of that conference each Federal agency presented its plans to abate air pollution from its facilities in the defined area. Federal installations account for about 30 percent of the air pollution of the District of Columbia and about 10 percent of the metropolitan area total. It is estimated that approximately $2 million will be required to abate air pollution from Federal operations in the area considered by the conference, exclusive of the $733,333 grant made by the Department of Health, Education, and Welfare to the government of the District of Columbia to permit the development of a sanitary landfill and the abolishment of open burning at the Kenilworth dump. Technology is available to solve the other major air pollution problems in the area. The General Services Administration is expected to play a key part in Washington, as elsewhere, because of its role in purchasing low-sulfur fuels for both the Federal Government buildings and those of the District of Columbia. The presentation of the Federal agency plans was important to this conference because of the relatively high density of Federal activities in the District of Columbia area.

No requests have been received from any department or agency for exemption from the provisions of the standards accompanying Executive Order 11282, and no requests have been received for operating permits. The cooperation by the Federal agencies with the Department of Health, Education, and Welfare and the Bureau of the Budget in developing the 5-year phased and orderly plan is overwhelming evidence of their desire to fully participate in developing national leadership in air pollution abatement envisioned by the Executive order. Eventual realization of this objective will depend upon the rate at which the program is funded.

APPENDIXES

APPENDIX A

1969 PROJECTS TO BE FUNDED (BASED UPON DATA RECEIVED FROM BOB DEC. 28, 1967)

Agency	Location	Problem
Department of Defense:		
Air Force	Andrews Air Force Base, Camp Springs, Md.	Fuel conversion, incinerator, smoke detectors.
	Davis-Monthan Air Force Base, Tucson, Ariz.	Smelting of scrap metal.
Army	Cameron Station, Alexandria, Va.	Vapor control, incinerator replacement.
	Volunteer Army Ammunition Plant, Chattanooga, Tenn.	NO_2, SO_2, H_2SO_4 particulates, incinerator.
	Arlington Hall Station, Arlington, Va.	Incinerators.
	Fort George Meade, Odenton, Md.	Fuel conversion, vapor control.
	Frankford Arsenal, Philadelphia, Pa.	Fuel conversion.
	Picatinny Arsenal, Dover, N.J.	Electrostatic precipitators, flue gas scrubbers, fuel conversion, incinerators.
	Fort Hamilton, Brooklyn, N.Y.	Vapor control, scrubbers, etc.
	Fort Dix, Fort Dix, N.J.	Mechanical collectors.
	Sunflower Army Ammunition Plant, Johnson Co., Kans.	Incinerators absorption tower, fly ash collectors.
	Joliet Army Ammunition Plant, Joliet, Ill.	Fuel conversion, mist eliminators, catalytic reduction, incinerators, particulate collectors.
	Pentagon, Washington, D.C.	Vapor control.
	Badger Army Ammunition Plant, Baraboo Wis.	Electrostatic precipitators, fuel conversion vapor control.
Navy	Naval Public Works Center, Great Lakes, Ill.	Fuel conversion.
	Naval Supply Depot, Philadelphia, Pa.	Do.
	Naval Damage Control Training Center, Philadelphia, Pa.	Firefighter school.
	Naval Training Center, Great Lakes, Ill.	Fuel conversion, fire training school.
	Naval Shipyard, Philadelphia, Pa.	Fuel conversion, incinerator, foundry fume collector.
	Electronic Training Center, Naval Station, San Diego, Calif.	Fire training school.
	Naval Air Station, Barber's Point, Honolulu, Hawaii.	Sanitary landfill, firefighter school.
	Naval Research Laboratory, Washington, D.C.	Smoke detectors.
	Naval Air Station, Glenview, Ill.	Firefighter school, smoke detectors.
	U.S. Naval Ordnance Lab, White Oak, Md.	Smoke detector.
	San Francisco Bay Naval Shipyard, Vallejo, Calif.	Fuel conversion.
	Naval Training Station, San Diego, Calif.	Firefighting school.
	Naval Air Station, Alameda, Calif.	Vapor recovery; firefighter school; scrubber; afterburner.
	Naval Air Station, Moffett Field, Sunnyvale, Calif.	Vapor control; sanitary landfill.
	Marine Corps Supply Center, San Bernardino, Calif.	Incinerator.
	Marine Corps Base, 29 Palms, San Bernardino, Calif.	Landfill.
	Naval Supply Center, Norfolk, Va.	Vapor control; fume collectors on smelters; rebuild furnaces.
	Naval Air Station, San Diego, Calif.	Fire school; vapor control, plating plant control.
	San Francisco Bay Naval Shipyard, San Francisco, Calif.	Fuel conversion.
	Naval Fuel Depot, San Pedro, Calif.	Vapor control.
	Naval Station, Long Beach, Calif.	Incinerator.
	Fleet Training Center, Newport, R.I.	Fire training center.
	Navy Public Works Center, Norfolk, Va.	Fuel conversion alarms and detectors.
	Navy Public Works Center, Newport, R.I.	Incinerator, fly ash eliminators.
	U.S. Naval Air Station, Minneapolis, Minn.	Vapor control; firefighter school; smoke detector.
	Naval Air Depot, Hawthorne, Nev.	Smoke recorders; fume collectors, fire school; baghouses.
	Marine Corps Station, San Diego, Calif.	Smoke detector.
	Naval Station, Kodiak, Alaska	Sanitary landfill; fire school; smoke detectors.

Agency	Location	Problem
Department of Defense—Con.		
Navy—Con.	Puget Sound Naval Shipyard, Bremerton, Wash.	Paint and metal fumes; smoke collectors; shredder and pulper.
	Naval Torpedo Station, Keyport, Wash.	Plating fumes; landfill; shredder-pulper.
	Naval Station, Adak, Alaska	Sanitary landfill, incinerator, fire school.
Corps of Engineers (Civil Works)	San Francisco Harbor	Drift removal.
	Potomac and Anacostia Rivers, Washington, D.C.	Do.
Department of Commerce	None	None.
Department of Justice	do	Do.
Department of Interior	do	Do.
General Services Administration	do	Do.
Treasury Department	do	Do.
Atomic Energy Commission	Brookhaven National Laboratory, Brookhaven, N.Y.	Fuel conversion.
	Argonne National Laboratories, Argonne, Ill.	Do.
	Bendix Plant, Kansas City, Mo.	Incinerator and waste destructor.
Department of Health, Education, and Welfare.	PHS Hospital, Detroit, Mich.	Incinerators and boilers.
	Gallaudet College, Washington, D.C.	Incinerators.
Department of Agriculture	Agricultural Research Center, Beltsville, Md.	
	Area No. 3, Animal husbandry, meat labs.	Fuel conversion, incinerator.
	Animal Parasite Station	Incinerator.
Smithsonian Institution	National Zoological Park, Washington, D.C.	Do.
Veterans' Administration	VA Hospital, East Orange, N.J.	Replace boilers.
	VA Hospital, San Fernando, Calif.	Incinerator, new and replacement.
National Aeronautics and Space Administration.	NASA Industrial Plant, Downey, Calif.	Incinerator for solvent control.
	Michoud Assembly Facility, New Orleans, La.	Incinerator.
	Mississippi Test Facility, Bay St. Louis, Miss.	Incinerator or sanitary landfill.
Post Office Department	Plan arrived late (Dec. 28, 1967), projects not reviewed by HCAPC.	
Tennessee Valley Authority	Shawnee Steam Plant, McCracken Co., Ky.	Installation of electrostatic precipitators.
	Gallatin Steam Plant, Gallatin, Tenn.	Electrostatic precipitators.
	Colbert Steam Plant	Electrostatic precipitators and mechanical collectors.
	Widows Creek Steam Plant	Do.
	Power Building, Chattanooga, Tenn.	Install dust collector or change fuel.

APPENDIX B

1968 PROJECTS SUBMITTED BY PARTICIPATING DEPARTMENTS AND AGENCIES

Agency	Location	Problem
Department of Defense:		
Air Force	Williams Air Force Base, Chandler, Ariz.	Vapor control.
	Beale Air Force Base, Marysville, Calif.	Scrubber for incinerator.
	Cape Kennedy, Cape Canaveral, Fla.	Incinerator modifications, firefighting school.
	Eglin Air Force Base, Walton Beach, Fla.	Install incinerator; vapor control; catalytic combustion chamber.
	Patrick Air Force Base, Cocoa Beach, Fla.	Provide incinerator.
	Robins Air Force Base, Warner Robins, Ga.	Incinerator and furnace installation.
	Scott Air Force Base, Belleville, Ill.	Sanitary landfill, modify heating plant.
	Chanute Air Force Base, Rantoul, Ill.	Install 2 incinerators.
	Bunker Hill Air Force Base, Peru, Ind.	Install incinerator, electrostatic precipitators.
	Phelps Collins ANG Base, Alpena County, Mich.	Vapor control.
	Offutt Air Force Base, Omaha, Nebr.	Modify incinerator, new incinerator.
	Omaha Air Force Station, Omaha, Nebr.	Fuel conversion.
	Lockport Air Force Station, Lockport, N.Y.	Mechanical filters.
	Hill Air Force Base, Ogden, Utah	Fuel conversion, modify incinerator, wood hammer mill.
	F. E. Warren Air Force Base, Cheyenne, Wyo.	Fuel conversion or electrostatic precipitators.
	Wright-Patterson Air Force Base, Greene County, Ohio.	New incinerator with new control equipment.
	Selfridge Air Force Base, Mount Clemens, Mich.	New incinerator, modify heating plant.

Agency	Location	Problem
Department of Defense—Con.		
Air Force—Con.	Wurtsmith Air Force Base, Oscoda, Mich.	Electrostatic precipitators.
	Vandenberg Air Force Base, Santa Barbara County, Calif.	Installation of vapor recovery system.
	Tyndall Air Force Base, Panama City, Fla.	Landfill.
	Hickam Air Force Base, Honolulu, Hawaii.	Modify incinerators; install pressure and vacuum relief valves.
	Barksdale Air Force Base, Bossier City, La.	New incinerator and waste disintegrators.
	L. G. Hanscom Field, Bedford, Mass.	Install smoke detectors.
	McGuire Air Force Base, Burlington County, N.J.	Fuel conversion.
	Montauk Air Force Station, Montauk, N.Y.	Do.
	National Guard Air Base, Floyd Bennett Field, Kings County, N.Y.	Do.
	Minot Air Force Station, Minot, N. Dak.	Do.
	Greater Pittsburgh Airport, ARPT, Allegheny County, Pa.	Install fill extension pipes.
	Lackland Air Force Base, San Antonio, Tex.	Install shredder.
	Perrin Air Force Base, Sherman, Tex.	Install incinerator.
	St. Albans Air Force Station, St. Albans, Vt.	Electrostatic precipitators.
	Minneapolis-St. Paul International Airport, Minneapolis, Minn.	Fuel conversion.
	Blaine Air Force Station, Blaine, Wash.	Install dust collectors.
	Lockbourne Air Force Base, Columbus, Ohio.	Fuel conversion.
	Kingsley Field, Klamath Falls, Oreg.	Modify tank filling equipment.
Army	Fort Lewis, Tacoma, Wash.	Fuel conversion, vapor control, smoke detector.
	Fort Knox, Fort Knox, Ky.	Fuel conversion, high efficiency separators.
	Camp Pickett, Blackstone, Va.	Fuel conversion, vapor control.
	USAQM Center and Fort Lee, Fort Lee, Va.	Do.
	Volunteer Army Ammunition Plant, Chattanooga, Tenn.	Multiple emissions.
	Tobyhanna Army Depot, Tobyhanna, Pa.	Smoke detector, vapor control.
	Watervliet Arsenal, Watervliet, N.Y.	Modify incinerator, smoke detector, contract waste disposal.
	Fort Dix, Fort Dix, N.J.	Fuel conversion, mechanical collectors.
	Fort Leonard Wood, Waynesville, Mo.	Fuel conversion, vapor control.
	Cornhusker Army Ammunition Plant, Grand Island, Nebr.	New incinerator, fuel conversion.
	Fort Benjamin Harrison, Indianapolis, Ind.	Fuel conversion, smoke alarm.
	Sierra Army Depot, Herlong, Calif.	Fuel conversion.
	D. A. Rocky Mountain Arsenal, Denver, Colo.	Vapor control, incinerator control.
Navy	Navy Public Works Center, Great Lakes, Ill.	Fuel conversion.
	Naval Training Center, Great Lakes, Ill.	Fuel conversion, firefighter school.
	Naval Shipyard, Philadelphia, Pa.	Incinerator, fuel conversion, fume collector.
	Naval Supply Depot, Philadelphia, Pa.	Fuel conversion.
	Fleet Training Center, San Diego, Calif.	Firefighter school.
	Fleet Training Center, Newport, R.I.	Firefighter training school.
	Public Works Center, Newport, R.I.	Incinerator, flyash controls.
	Naval Shipyard, Boston, Mass.	Incinerator, dust collectors.
	Naval Air Station, Honolulu, Hawaii.	Sanitary landfill, firefighting school.
	Naval Shipyard, Charleston, S.C.	Dust collector, fume collector.
	Naval Training Center, Bainbridge, Md.	Precipitators and incinerators, scrubbers.
	Electrical Training Center, Norfolk, Va.	Firefighting school.
	Naval Air Station, Brooklyn, N.Y.	Fuel conversion.
	Naval Hospital, Queens County, N.Y.	Fuel conversion, scrubbers on incinerators.
	Marine Corps Supply Activity, Philadelphia, Pa.	Fuel conversion.
	Naval Hospital, Philadelphia, Pa.	Do.
	Naval Air Engineering Center, Philadelphia, Pa.	Do.
	Naval Air Development Center, Philadelphia, Pa.	Do.
	Naval Ammunition Depot, Monmouth County, N.J.	Do.
	Mitchell (Shaw Federal Housing (part of shipyard), Garden City, N.Y.	Do.
	Hq 1st Marine Corps District, New York, N.Y.	Do.
	Naval Reserve Training Center, Clifton, N.J.	Do.

Agency	Location	Problem
Department of Defense—Cont.		
Navy—Cont.	Naval Reserve Training Center, Elizabeth, N.J.	Fuel conversion.
	Naval Reserve Training Center, Nassau County, N.Y.	Do.
	Naval Reserve Training Center, Suffolk County, N.Y.	Do.
	Naval Reserve Training Center, Jersey City, N.J.	Do.
	U.S.N.R. Reserve Shipyard, Keyport, N.J.	Do.
	Naval Reserve Training Center, Watertown, N.Y.	Do.
	Naval and Marine Corps Training Center, Schuyler, N.Y.	Do.
	Naval Reserve Training Center, Youngstown, N.Y.	Do.
	Marine Corps Reserve Training Center, New York, N.Y.	Do.
	Naval Shipyard, Kings County, N.Y.	Install scrubber on incinerator.
U.S. Department of Agriculture	Hoxie	None.
Department of Interior	do	Do.
Smithsonian	do	Do.
Atomic Energy Commission	Argonne National Laboratory, Argonne, Ill.	Fuel conversion.
	Brookhaven National Laboratory, Brookhaven, N.Y.	Do.
	Mound Laboratory, Miamisburg, Ohio	Fuel conversion incinerator w/scrubber.
	Burlington Plant, Burlington, Iowa	Fuel conversion.
	Knolls Atomic Power Laboratory, West Milton, N.Y.	Install smoke detectors, fuel conversion.
	Knolls Atomic Power Laboratory, Niskayuna, N.Y.	Install submerged filling inlet.
	Oak Ridge National Laboratory, Oak Ridge, Tenn.	Install vapor recovery and control systems.
	Argonne National Laboratory, Bingham County, Idaho.	Install alarm systems.
	Savannah River Plant, Aiken and Barnwell Counties, S.C.	Sanitary landfill.
	Richland Operations Office Adams, Benton, Grant, and Franklin Counties, Wash.	Install monitoring and recording instruments.
	Knolls Atomic Power Laboratory, Bingham County, Idaho.	Install smoke detector, increase stack height, install fuel air controls.
Corps of Engineers (Civil Works)	Puget Sound	Drift removal.
	New York Harbor	Do.
	Derrickboat Tonawanda, Cleveland, Ohio.	Conversion to No. 2 oil.
	U.S. clipper dredge Genesee, various harbors on Lake Michigan.	Install smoke detector.
National Aeronautics and Space Administration.	Michoud Assembly Facility, Marshall Space Flight Center, New Orleans, La.	Fuel conversion, incinerator.
	Goddard Space Flight Center, Greenbelt, Md.	Fuel conversion.
	Ames Research Center, Moffett Field, Calif.	Fume scrubber, incinerator afterburner.
	Langley Research Center, Hampton Va.	To study control requirements of heating plant.
Department of Justice	Federal Reformatory, Petersburg, Va.	Fuel conversion.
Department of Commerce	National Bureau of Standards, Gaithersburg, Md.	Do.
General Services Administration	Federal Office Building, Brooklyn, N.Y.	Do.
	U.S. Courthouse and Federal Building, Chicago, Ill.	Do.
	Heating plant, Philadelphia, Pa.	Do.
	Bronx Central Station, Bronx, N.Y.	Do.
	Federal Office Building, New York, N.Y.	Do.
	Courthouse and Federal Building, Brooklyn, N.Y.	Do.
	Post Office and Courthouse, Newark, N.J.	Do.
	Somerville Depot, Somerville, N.J.	Do.
	Federal Office Building, Brooklyn, N.Y.	Do.
	do	Do.
	Madison Square Post Office, New York, N.Y.	Do.
	Post Office and Courthouse, Camden, N.J.	Do.
	Post Office, Jersey City, N.J.	Do.
	North Philadelphia Postal Station, Philadelphia, Pa.	Do.
	Federal Building, Newark, N.J.	Do.
	Post Office, Paterson, N.J.	Do.
	Federal Building and U.S. Courthouse, Hammond, Ind.	Do.
	Post Office, Flushing, N.Y.	Do.
	Post Office, Jamaica, N.Y.	Do.
	U.S. Post Office, Oak Park, Ill.	Do.

Agency	Location	Problem
General Services Administration—Con.	Post Office, East Orange, N.J.	Fuel conversion.
	U.S. Post Office, Maywood, Ill.	Do.
	U.S. Post Office, Waukegan, Ill.	Do.
	Post Office, Long Island, N.Y.	Do.
	Englewood Postal Station, Chicago, Ill.	Do.
	Post Office Elmhurst, Ill.	Do.
	Federal Center Building 47, Denver, Colo.	Do.
	Post Office, Minneapolis, Minn.	Repair heating plant and fuel conversion.
Tennessee Valley Authority	Shawnee Steam Plant, Tenn.	Particulates.
	Colbert Steam Plant, Tenn.	Do.
	Widow's Creek Steam Plant, Tennessee	Do.
	Gallatin Steam Plant, Tennessee	Do.
	Power Building, Chattanooga, Tenn.	Install dust collector or fuel conversion.
Department of Health, Education, and Welfare.	PHS Hospital, Fort Worth, Tex.	Incinerator, combustion controls.
	PHS Hospital, Lexington, Ky.	Fuel conversion, incinerator.
	PHS Hospital, Boston, Mass.	Incinerator.
	Howard University, Washington, D.C.	Boiler replacement truck for trash removal.
	FDA Research Facility, Beltsville, Md.	Incinerator.
Veterans' Administration	VA Hospital, Ann Arbor, Mich.	Fuel conversion.
	VA Hospital, Battle Creek, Mich.	Do.
	VA Hospital, Castle Point, N.Y.	Precision of landfill
	Veterans Center, Dublin, Ga.	Fuel conversion and incinerator.
	VA Hospital, Durham County, N.C.	Fuel conversion.
	VA Hospital, Erie, Pa.	Do.
	VA Center, Fargo, N. Dak.	Do.
	VA Hospital, Fayetteville, N.C.	Do.
	VA Hospital, Grand Junction, Colo.	Do.
	VA Hospital, Iron Mountain, Mich.	Do.
	VA Hospital—Jefferson Barracks, St. Louis, Mo.	Do.
	VA Hospital, Kansas City, Mo.	Do.
	VA Hospital, Knoxville, Iowa	Do.
	VA Hospital, Lexington, Ky.	Do.
	VA Hospital, Louisville, Ky.	Do.
	VA Hospital, Lyons, N.J.	Do.
	VA Hospital, Madison, Wis.	Do.
	VA Hospital, Montrose, N.Y.	Fuel conversion, new incinerator.
	VA Hospital, Sheridan, Wyo.	Fuel conversion.
	VA Hospital, Spokane, Wash.	Do.
	VA Hospital, Tomah, Wis.	Do.
	VA Hospital, Vancouver, Wash.	Do.
	VA Hospital, West Haven, Conn.	Do.
	VA Hospital, Aspinwall, Pa.	Replace boiler.
	VA Hospital, Salem, Va.	Sanitary landfill, replace boilers.
	VA Hospital, Mountain Home, Tenn.	Replace boilers.
	VA Hospital, Chillicothe, Ohio	Replace boiler plant, develop sanitary fill.

91ST CONGRESS } SENATE { DOCUMENT
1st Session } { No. 91-10

Crisis H Rep. Ex. 4, 57
8/19/69

AIR POLLUTION ABATEMENT BY FEDERAL FACILITIES

SECOND REPORT

OF THE

SECRETARY OF HEALTH, EDUCATION, AND WELFARE

TO THE

UNITED STATES CONGRESS

PURSUANT TO

Public Law 90-148
THE AIR QUALITY ACT OF 1967

JANUARY 1969

MARCH 4, 1969.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
25-140 O WASHINGTON : 1969

SENATE RESOLUTION 88

Submitted by Mr. Randolph of West Virginia

IN THE SENATE OF THE UNITED STATES,
Agreed to March 4, 1969.

Resolved, That there be printed with illustrations as a Senate document the report of the Secretary of Health, Education, and Welfare, entitled "Air Pollution Abatement by Federal Facilities" submitted to the Congress in accordance with section 306, Public Law 90-148, the Air Quality Act of 1967, and that there be printed two thousand five hundred additional copies of such document for the use of the Committee on Public Works.

FRANCIS R. VALEO,
Secretary.

LETTER OF TRANSMITTAL

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE,
Washington, D.C., January 17, 1969.

Hon. HUBERT H. HUMPHREY,
President of the Senate,
Washington, D.C.

DEAR MR. PRESIDENT: In accordance with the provisions of title I, section 111(b) of Public Law 90-148 (the Air Quality Act of 1967), I am pleased to transmit the report on measures being taken by Federal agencies to control the emission of air pollutants from Federal facilities.

It is the intent of this report to describe in detail such progress as as has been made toward controlling air pollution from sources for which Federal departments or agencies have jurisdiction.

Sincerely,

WILBUR J. COHEN,
Secretary.

CONTENTS

		Page
I.	Introduction	1
II.	Abatement plan	2
III.	Exemptions	3
IV.	Remedial actions	5
V.	Washington, D.C., metropolitan area	7
VI.	Miscellaneous activities	9
VII.	Conclusion	11
	Appendix A	12
	Appendix B	16
	Appendix C	17

AIR POLLUTION ABATEMENT BY FEDERAL FACILITIES

I. INTRODUCTION

The Air Quality Act of 1967, as did the earlier Clean Air Act, as amended, emphasizes the need for Federal leadership and assistance to State and local agencies in the control of air pollution. The act also indicates that the Federal agencies shall cooperate with the Department of Health, Education, and Welfare and with any air pollution control agency in preventing and controlling air pollution. It also provides, at the discretion of the Secretary, for the establishment of classes of air pollution sources for which limited permits could be issued, and it further requires the Secretary to submit an annual report to the Congress on the status of such permits and compliance therewith.

In addition to this act, the program of abatement and control of air pollution from Federal facilities is governed by Executive Order 11282, dated May 26, 1966, entitled, "Control of Pollution Originating From Federal Installations"; the "Performance Standards and Techniques of Measurement" prescribed by the Secretary of Health, Education, and Welfare, issued June 2, 1966, and subsequently amended, in response to "Section 5 Standards" of Executive Order 11282; Bureau of the Budget Circular No. A–78 issued on August 6, 1966, to the heads of executive departments and establishments.

The issuance of limited exemptions, as provided under the Executive order, has been used as a control device, rather than development of a permit system, as authorized in the Air Quality Act of 1967.

The staff of the Federal Facilities Section, National Air Pollution Control Administration, devotes full time to the surveillance of air pollution problems arising from Federal activities, the extension of technical assistance to agencies and departments and to studies for scheduling necessary improvements to control emissions from Federal establishments. This staff also assists the Bureau of the Budget in technical and administrative review of the 5-year phased and orderly plans prepared by the various governmental groups concerned in this abatement activity.

II. ABATEMENT PLAN

As called for by Executive Order 11282 and Bureau of the Budget Circular No. A–78, the departments and agencies submitted revisions of their original phased and orderly plans on July 1, 1968, and also, for the first time, furnished reports of progress on projects which could be funded within available appropriations.

The revised plans are concerned principally with proposed abatement actions to be undertaken during fiscal year 1970. Appendix A contains the detailed proposals for abatement activities which have been recommended for funding by the Bureau of the Budget for fiscal year 1970.

On June 20, 1968, the Secretary of Health, Education, and Welfare announced that 32 Air Quality Control Regions would be designated during the next 12 months. These regions, in the order in which designation is expected to occur, are the following:

1. Washington, D.C.
2. New York
3. Chicago
4. Philadelphia
5. Denver
6. Los Angeles
7. St. Louis
8. Boston
9. Cincinnati
10. San Francisco
11. Cleveland
12. Pittsburgh
13. Buffalo
14. Kansas City
15. Detroit
16. Baltimore
17. Hartford
18. Indianapolis
19. Minneapolis-St. Paul
20. Milwaukee
21. Providence
22. Seattle-Tacoma
23. Louisville
24. Dayton
25. Phoenix
26. Houston
27. Dallas-Fort Worth
28. San Antonio
29. Birmingham
30. Toledo
31. Steubenville
32. Chattanooga

Under the Air Quality Act of 1967, designation of regions is a fundamental step leading toward action by State governments to adopt and enforce standards to control air pollution on a regional basis.

Once regions are designated, the Air Quality Act of 1967 requires that States set ambient air quality standards for the regions within 9 months following the publication of criteria for particular pollutants. An additional 6 months are allowed for the development of an implementing plan which would include emission standards for pollution sources. This standard-setting process is expected to begin in the first regions early in calendar year 1969.

Almost all of the Federal facility projects included in the President's budget for fiscal year 1970 are located in the 32 Air Quality Control Regions listed above. The funding of these projects will permit Federal facilities to provide leadership in abating air pollution in these regions.

A few additional projects are included in the President's 1970 budget because they are violations of local codes or are designated to abate toxic emissions which involve imminent danger to health. A project at one installation is included because of excessive complaints from the public.

III. EXEMPTIONS

The Department of Defense requested and was granted a 1-year exemption (to October 1, 1969) from the provisions of section 76.5, title 42, Code of Federal Regulations, part 76, dated March 17, 1967. This section required control of sulfur oxide emissions in the Chicago and New York Standard Consolidated Areas and the Standard Metropolitan Statistical Area of Philadelphia by October 1, 1968. It was impossible for the Department of Defense to meet this deadline with regard to a number of its facilities which require large capital expenditures for conversion of their boilers. The Department's fiscal year 1969 budget had progressed too far to allow the changes necessary to provide for these conversions. The President's fiscal year 1970 budget will allow the Department to undertake substantially all of these conversions.

The Atomic Energy Commission requested an exemption from the provisions of the same section requiring control of sulfur oxides in the New York and Chicago Standard Consolidated Areas for the Brookhaven and the Argonne National Laboratories, respectively. The request was based on the denial of funds by the Joint Committee on Atomic Energy for conversion to lower sulfur fuels at these laboratories. An exemption for 1 year (to October 1, 1969) has been granted to the Atomic Energy Commission for the Argonne and Brookhaven sites on the proviso that the Commission again request funds for fiscal year 1970 to convert the heating plant at Argonne to natural gas and that efforts be made to secure 1 percent sulfur fuel oil for Brookhaven.

The Joint Committee on Atomic Energy in its denial of funds for fiscal year 1969, urged a delay in the Argonne project pending an expected breakthrough on research which would produce an economically acceptable method of removing sulfur oxides from stack gases. Atomic Energy Commission representatives have been informed by the National Air Pollution Control Administration that the current research on developing control techniques for removing sulfur oxides from stack gases is directed to produce methodology suited for control of large fossil fuel-burning power-generating sources and not directed to heating plants as small as that at Argonne National Laboratory. This laboratory is within the boundaries of the Metropolitan Chicago Interstate Air Quality Control Region, which is identical to the Chicago Standard Consolidated Area. Since the region will be expected to have air pollution control standards and regulations within the next 15 months, a conversion of this facility now would be consistent with providing Federal leadership, as called for in Executive Order 11282.

The Department of Transportation requested, and was granted, a 1-year exemption for fuel conversion at the Coast Guard base on Governor's Island, N.Y. This base is partially converted to burn No. 2 distillate fuel oil, and the exemption was granted with the

proviso that conversion be completed as soon as additional funds become available. It is expected that this task will be completed before October 1, 1969.

Similarly, the Department of Agriculture requested an exemption from the sulfur-oxide regulation for the heating plant at the Plum Island, Long Island, Animal Disease Laboratory. A 1-year exemption also was granted in this case, on the proviso that the laboratory use the lowest possible sulfur content fuel oil which can be obtained from the General Services Administration for use at this site.

IV. REMEDIAL ACTIONS

Actions to abate air pollution from Federal facilities were reported this year, for the first time, to the Bureau of the Budget. As required by Bureau of the Budget Circular No. A-78, these reports arrived on July 1, 1968, and reflect conditions as of April 1, 1968.

A summary of these reports reveals that 442 remedial actions were reported for 387 installations located in 45 States, the District of Columbia, Puerto Rico, and Guam. With few exceptions, the remedial actions fall into the following categories:

1. Elimination of open burning of refuse.
2. Installation of new incinerators or upgrading of existing incinerators to meet Federal regulations.
3. Reduction of particulate emissions from heating and power plants by:
    a. Repairs to old plants.
    b. Construction of new plants.
    c. Improvement of particulate collectors.
    d. Installation or improvement of particulate monitors.
    e. Conversion from coal to either gas or fuel oil.
4. Reduction of sulfur oxide emissions from heating plants by:
    a. Using same type of fuel but of lower sulfur content.
    b. Converting to a different fuel of lower sulfur content.
5. Reduction of gasoline and solvent vapor losses from storage tanks.
6. Awarding of contracts during the year to remedy specific situations.
7. Initiation of studies, design and/or engineering actions to prepare cost estimates.

Appendix B presents an overall summary of accomplishmants by agency and by remedial action category.

Appendix C presents a detailed list of installations, arranged by agency, reporting the above listed remedial actions.

These remedial actions reflect, in part, normal air pollution control activities of the agencies funded from their regular budgets as well as actions stimulated and accelerated by the promulgation of Executive Order 11282 and the need to prepare the 5-year phased and orderly plan. Congressional action on fiscal year 1969 budget requests had not been completed by April 1, 1968, and therefore, most of these projects represent relatively small expenditures of funds already available to solve relatively simple and inexpensive problems. Abatement actions at large installations or on very expensive projects generally must await funding. Installation of electrostatic precipitators at the large Tennessee Valley Authority powerplants is an exception to this situation, because of alternate sources of funds.

25-140 O—69——2

These reports also reflect favorably on the efforts of agencies to comply with the strict sulfur-oxide regulations governing the New York and Chicago standard consolidated areas and the standard Metropolitan Statistical Area of Philadelphia.

Fuels for use in these areas by the civilian agencies are obtained principally by the General Services Administration. Inquiry to the General Services Administration elicited the information that all fuels used in the Chicago standard consolidated area are in conformity with the requirements of the Executive order.

Attempts to secure bids on fuels which would meet the Executive order regulations for New York and Philadelphia failed for the most part. The limited response required a 64 percent premium over costs of existing fuel. Readvertising for a maximum of 1 percent sulfur content brought good response resulting in an 11 percent to 16 percent increase in costs over previous higher sulfur fuels. These responses were considered acceptable. This means that, for these areas, a No. 4 fuel oil with 0.7 percent sulfur and a No. 6 fuel oil with 1.0 percent sulfur maximum will be used for the 1968–69 heating season.

This success in securing fuel oil with 1 percent or slightly less than 1 percent sulfur is encouraging and forecasts a considerable improvement in future sulfur-oxide emissions; additional improvements will accrue as a result of conversions to natural gas.

V. WASHINGTON, D.C., METROPOLITAN AREA

Considerable progress in controlling air pollution has been made by Federal facilities in the area following the National Capital Metropolitan Area Interstate Air Pollution Abatement Conference held by the Department of Health, Education, and Welfare in December 1967. Open burning has been discontinued at Kenilworth Dump in the District of Columbia and a sanitary landfill has been started. The Department of Health, Education, and Welfare, the Department of the Interior and the government of Washington, D.C. were instrumental in effecting this long-sought change.

The Department of Commerce has completed conversion of the heating plant at the National Bureau of Standards in Gaithersburg, Md., to burn natural gas, with No. 2 fuel oil as standby; and the Treasury Department has modified the classified-waste incinerator at the Bureau of Engraving and Printing in Washington, D.C. Pending funds for replacement, an incinerator at the Agricultural Research Station in Beltsville, Md., has been repaired by the Department of Agriculture.

Conversion of heating plants to burn natural gas is underway at the Goddard Space Flight Center of the National Aeronautics and Space Administration in Greenbelt, Md., and at the National Zoological Park of the Smithsonian Institution in Washington, D.C.

With respect to the Department of Health, Education, and Welfare, the Food and Drug Administration in Beltsville, Md., has reduced particulate emissions from a faulty incinerator by making operational changes; several incinerators have been eliminated on the Howard University campus in Washington, D.C., by transporting refuse to the District of Columbia incinerators; St. Elizabeth's Hospital in the District has contracted for replacement of a faulty pathological incinerator, has installed smoke meters on coal and oil-burning boilers and has secured funds for equipping the main refuse incinerator with air pollution control equipment; the National Institutes of Health in Bethesda, Md., is now using a No. 6 fuel oil with a maximum sulfur content of 0.5 percent, is redesigning classified waste incinerators for installation of both afterburners and water scrubbers, and is engaged in a joint effort with the Department of the Army and the Department of the Navy to design and construct a large general waste incinerator to serve the National Institutes of Health, the Naval Medical Center, and Walter Reed Hospital and Annex. Construction will be at the annex site in Maryland. The Department of the Army has been issued a permit for land use for this project and design has been started.

The General Services Administration, as anticipated, is playing an important role in the Washington, D.C. metropolitan area, as elsewhere, with respect to procurement of low-sulfur fuel. Since November 1967, all fuel oil procured for the Department of Defense facilities in the Washington area by the General Services Administration has contained 2 percent sulfur. For the 1968–69 heating season, fuels have

been secured at 1.5 percent sulfur, which is in accord with the recommendations of the Washington abatement conference. Furthermore, it is expected that for the 1969–70 heating season 1 percent sulfur fuels will be provided. Department of Defense facilities involved are the following:

Arlington Hall Station, Arlington, Va.;
Pentagon Building, Arlington, Va.;
Cameron Station, Alexandria, Va.;
Fort Belvoir, Springfield, Va.;
Harry Diamond Laboratories, Washington, D.C.;
Fort Leslie J. McNair, Washington, D.C.;
Walter Reed Army Medical Center, Washington, D.C.;
N. G. Camp Sims, Washington, D.C.;
Walter Reed Army Medical Center (Forest Glen Annex), Maryland;
Army Map Service, Montgomery County, Md.;
Andrews Air Force Base, Maryland;
Naval Research Laboratory, Washington, D.C.;
Marine Barracks, Washington, D.C.;
Naval Communications Station, Cheltenham, Md.;
Naval Medical Center, Bethesda, Md.; and
Naval Ordnance Laboratory, White Oaks, Md.

Additional activities of the General Services Administration in this area have resulted in the replacement of three boilers, previously burning number 6 fuel oil, with two gas-fired boilers at the old Bureau of Standards property on Connecticut Avenue in the District of Columbia. The General Services Administration also has reported that all of the major coal-burning steam plants operated by the General Services Administration now are using coal containing 1 percent sulfur or less.

Remaining problems of air pollution abatement in Federal facilities in and around Washington, D.C., generally are minor and work is proceeding on many of these at this time.

VI. MISCELLANEOUS ACTIVITIES

During calendar year 1968, emission inventories of all 77 Federal facilities in the Kansas City area were completed and entered in the record of the second session of the Kansas City, Kans.-Kansas City, Mo. Interstate Air Pollution Abatement Conference. A similar inventory was completed of the 185 Federal facilities in the Philadelphia, Pa., area in conjunction with the Delaware Valley regional air quality program which is being conducted cooperatively by Federal, State, and local agencies.

In view of the mandate for Federal facilities to exhibit leadership in abating air pollution, inventories of emissions from Federal facilities have been completed in Washington, D.C., New York, Chicago, Philadelphia, Chattanooga, and Detroit and started in Denver, St. Louis, Boston, and San Francisco. Eventually, all 32 regions will be completely inventoried. Information will be helpful to the facilities themselves and will be important in any overall area emission studies which must be carried out before control programs are developed by States and communities concerned within each region.

Special studies also are underway concerning air pollution problems and control practices in Federal foundries, ammonia oxidation plants used to manufacture nitric acid, and sulfuric acid manufacturing plants. Information secured from these studies will be helpful in developing improved control techniques for these air pollutants.

The Department of Defense again has included proposals for control of emissions from the Volunteer Army ammunition plant in Hamilton County, Tenn. Proposals for this plant have been included in fiscal year 1969 plans but were not funded by Congress. This plant probably is the worst single Federal source of air pollution, principally oxides of nitrogen, in the United States. It has been the source of complaints, congressional inquiries and general citizen dissatisfaction in its vicinity. Failure to fund the 1969 project was a distinct disappointment and it is hoped that corrective measures will be funded in fiscal year 1970.

Technical assistance on specific problems associated with boiler operations was given to the Department of Defense, Veterans' Administration, and the Department of Health, Education, and Welfare. Similar help concerning incinerators was given to the Smithsonian Institution and to the Departments of Defense, Interior, and Agriculture.

A conference was held with representatives of the Corps of Engineers (civil works) concerning the disposal of debris from New York Harbor. Representatives of the Corps were reminded that the pit incinerator being constructed at Caven Point, N.J., in its proposed form, may be inadequate to meet the standards concerning particulate emissions. If this should prove to be true following testing of this device, further design and engineering will be necessary to secure compliance with the regulations.

A carbon monoxide control study related to automotive traffic was started at selected border stations at the request of the Public Buildings Service of the General Services Administration.

The Washington, D.C., Air Pollution Division and the National Park Service of the Department of the Interior were advised concerning an incinerator designed for the destruction of brush and logs. These agencies are attempting to dispose of this waste in a manner which hopefully will replace the current open burning. Specialized activities have been continued to assure the control of exhaust products from missiles and rockets powered with highly toxic propellants. These activities involved close cooperation and interagency liaison with the Department of Defense, National Aeronautics and Space Administration, Atomic Energy Commission, Armed Services Explosives Safety Board, and the National Academy of Sciences-National Research Council. During the year, not a single rocket motor containing beryllium propellant was fired in the open air of the continental United States.

In the interest of providing further assistance during the year, the Federal Facilities Section distributed several hundred copies of the 892-page publication titled "Air Pollution Engineering Manual" to the Federal agencies. Also distributed for comment and technical criticism was the "Interim Guide to Good Practice for Selecting Incinerators for Federal Facilities."

The Section also participated in a training course at Durham, N.C., for approximately 70 engineers of the Army Materiel Command and in a seminar at the Army Environmental Health Agency, Edgewood Arsenal, Edgewood, Md., with representatives of the Army Surgeon General's Office, the Bureau of the Budget and the Federal Water Pollution Control Administration, to review the operation of the 5-year phased and orderly plan.

VII. CONCLUSION

The Federal departments and agencies again this year evidence excellent cooperation with the Department of Health, Education, and Welfare and the Bureau of the Budget for purposes of preventing and controlling air pollution. The reports of progress highlight both the efforts and the intentions of the agencies. With sufficient funding, there is no reason why air pollution control by Federal agencies should not be successful. Announcement of the establishment of the first 32 air quality control regions by the National Air Pollution Control Administration has given further impetus to this program and has defined more sharply than heretofore areas to which specific attention must be provided both by the Federal Government and by State and local organizations.

Sufficient funding will enable prompt abatement of air pollution from Federal establishments.

APPENDIX A

FISCAL YEAR 1979 PROJECTS TO BE RECOMMENDED BY THE PRESIDENT

Agency	Installation	Proposed action
Department of Agriculture	Agricultural Research Center, Beltsville, Md.	Construct new incinerator for Animal Husbandry Meats Laboratory and a new pathological incinerator for Building 125A, Animal Parasite Station, area 1. Convert Heating Plant 307BA, area 3 to gas with No. 2 fuel oil as standby.
Atomic Energy Commission	Feed Materials Production Center, Fernald, Ohio	Install sanitary landfill and 2 special purpose incinerators.
	Argonne National Laboratory, Argonne, Ill	Convert heating plant to natural gas.
Department of Commerce	U.S. Merchant Marine Academy, Kings Point, N.Y.	Conversion of heating plant to No. 2 fuel oil or to gas with oil standby depending on results of engineering feasibility study now underway.
General Services Administration	Post Office and Courthouse, East St. Louis, Ill.	Convert boiler to oil or gas.
	AEC Building, Germantown, Md.	Install wet scrubber on incinerator.
	Military Personnel Records Center, Overland, Mo.	Convert boiler from coal to No. 2 fuel oil.
	Post office (Back Bay annex), Boston, Mass.	Convert to oil.
Department of Health, Education, and Welfare	Public Health Service hospital, Detroit, Mich.	Replace boilers and install 2 incinerators.
Smithsonian Institution	National Zoological Park, Washington, D.C.	Improve control of incinerator by wet scrubber and convert coal steamplant to gas.
Tennessee Valley Authority	Shawnee steamplant, McCracken County, Ky.	Complete installation of electrostatic precipitators on all 10 units.
	Widows Creek steamplant, Jackson County, Ala.	Upgrading electrostatic precipitators on units 7 and 8 will be continued.
	Gallatin steamplant, Sumner County, Tenn.	Complete installation of electrostatic precipitators.
Veterans' Administration	VA Hospital, Bronx, N.Y.	Replace 3 boilers with 1 boiler and convert 2 boilers to gas and No. 2 fuel oil.
	VA hospital, Butler, Pa.	Replace 3 boilers with 2 boilers burning gas and No. 2 fuel oil.
	VA hospital, Pittsburgh, Pa. (UH)	Convert 4 boilers to gas and No. 2 fuel oil.
	VA hospital, Pittsburgh, Pa. (NP)	Convert 3 boilers to gas and No. 2 fuel oil.
	VA center, Dayton, Ohio	Convert 4 boilers to gas and No. 2 fuel oil.
	VA hospital, Cincinnati, Ohio (Fort Thomas)	Replace 4 boilers with 2 burning gas and No. 2 fuel oil.
	VA hospital, Brecksville, Ohio	Replace 1 boiler and convert 2 boilers to gas and No. 2 fuel oil.
Department of Defense:		
Air Force	Davis-Monthan Air Force Base, Tucson, Ariz.	Install a 75-ton-per-day scrap metal smelter complete with shredding device, automatic loading and weighing equipment, multicombustion chamber design, high-temperature refractory, an automatic metal reclaiming system, dross remover, and air pollution abatement control equipment.
	Bradley Air National Guard, Windsor Locks, Conn.	Install smoke density recorder meter on boiler.
	Eglin Air Force Base, Ft. Walton Beach, Fla.	Install incinerator in marketing and redistribution area; modify 5 POL storage tanks to floating roof configuration; install wet scrubber for asphalt plant; install catalytic combustion chamber and ducts over gas vents of each of 3 install tanks.
	Scott Air Force Base, Belleville, Ill	Install sub merged fill-pipe in 7 underground aviation gas tanks.
	Andrews Air Force Base, Camp Springs, Md.	Enlarge Building 34-D (Navy plant) to contain oil-fired equipment and eliminate Building 3743. Convert from coal to low-sulfur fuel oil (No. 2) all boilers in Buildings 3039, 3212, 3755, and 4231. Install smoke density meters to all existing boilers over 10 million BTU input capacity.
	McGuire Air Force Base, Burlington County, N.J.	Convert boilers in Buildings 21-01, 34-02, to natural gas; Buildings 16-23, 18-07, 24-01, 33-72, 34-10, and 19-05 to No. 2 fuel oil. Same for Building 18-01.

1485

	McGuire Air Force Base ANG areas, Wrightstown, N.J.	Convert 2 oil burners from No. 4 fuel oil to No. 2 fuel oil.
	Lockport Air Force Station, Lockport, N.Y.	Design mechanical filters for boilerhouse stack at main boiler plant.
	Wright-Patterson Air Force Base, Greene County, Ohio.	Design gas scrubber for incinerator in building 202.
	Brooks Air Force Base, San Antonio, Tex.	Design refuse incinerator to eliminate sanitary landfill operation because of limited land.
	Carswell Air Force Base, Fort Worth, Tex.	Repair existing incinerator in building 1730. Base refuse to be disposed of by contract in fiscal year 1970.
	McChord Air Force Base, Tacoma, Wash.	Construct incinerator to eliminate burn and cover garbage refuse.
Army	General Mitchell ANG Base, Milwaukee, Wis.	Install smoke density recording meter.
	Volunteer Army Ammunition Plant, Hamilton County, Tenn.	For TNT production area, complete installation of instrumentation for TNT waste acid fume recovery system; install additional bubble-cap towers to increase absorption capacity of TNT waste acid recoveries; investigate more efficient air jet to decrease volume of fumes from bi-oil at bi-house to permit introduction of fumes into fume recovery line; make absorption study to determine optimum TNT waste acid recovery conditions; install scrubbers to remove nitrogen oxides from recovery bubble-cap absorption column stack gas and from wash house gases; improve performance of fume lines between mono and bi-houses and acid recovery buildings. For sand acid production area, the use of natural gas is awaiting a gas contract; testing to be done to determine feasibility of a mist filter to replace the electrostatic precipitators and the Nelson fog filters; possible installation of a combustion unit for nitric acid concentration and nitrate tanks; for Ammonia Oxidation Plant, improve process control and consider use of catalytic combustion units to eliminate oxides of nitrogen. For the Red Water Incineration Plant, use of natural gas is awaiting contract; install an improved fuel system and a wet scrubbing system. Problem of eliminating open burning area is under study. Recommendations also have been submitted for a completely modern TNT plant with allied acid facilities to reduce pollution costs.
	Joliet Army Ammunition Plant, Joliet, Ill.	Replacement of open burning by a sanitary landfill; install mist eliminator equipment for sulfuric acid concentrators and convert to natural gas; design catalytic combustion units for ammonia oxidation plants; install mist eliminator equipment for steam production units and for pellite producing units; install fume scrubbing system for TNT recovery buildings and for tetryl recovery building; convert to natural gas and install particulate collectors for red water incinerators; use lower sulfur oil for central heating plants and install sanitary landfill for nonexplosive material to eliminate open burning at the load assembly pack unit.
	Fort Benjamin Harrison, Indianapolis, Ind.	Design conversion of central coal-fired heating plant to natural gas; design to connect that plant to heating plant No. 2 with steam line; design conversion to No. 2 fuel oil for 2 consolidated manpacks.
	U.S. Army Reserve Center, Indianapolis, Ind.	Convert coal-fired heating system to natural gas.
	Picatinny Arsenal, Dover, N.J.	Conversion of coal-fired boilers to natural gas with low-sulfur fuel oil standby; use of low-sulfur fuel oil at oil-fired heating plants.
	Granite City Army Depot, Granite City, Ill.	Construct incinerator to eliminate 2 open burning areas.
	Fort Sam Houston, San Antonio, Tex.	Install system to reclaim used oil thereby eliminating open burning from salvage oil pit.
	Aberdeen Proving Ground, Aberdeen, Md.	Install submerged inlets on gasoline storage tanks to reduce loss of gasoline through evaporation.
	Edgewood Arsenal, Edgewood, Md.	Design of new incinerator for waste disposal.
	Fort George Meade, Odenton, Md.	Design conversion of coal-fired heating plants to either oil- or gas-fired units depending upon economics study.
	Valley Forge General Hospital, Phoenixville, Pa.	Replace short stacks on 3 boilers with breeching to existing 100-foot brick stacks and install fly ash collection hoppers; install photoelectric smoke detectors on boilers over 10 M B.t.u. per hour input. Design replacement incinerator for a larger facility with smoke and particulate abatement equipment.

See footnote at end of table, p. 15.

APPENDIX A—Continued

FISCAL YEAR 1970 PROJECTS TO BE RECOMMENDED BY THE PRESIDENT

Agency	Installation	Proposed action
Department of Defense—Continued		
Army—Continued	Frankford Arsenal, Philadelphia, Pa	Design for conversion from No. 6 oil to combination of No. 2 oil and gas.
	Fort Dix, Burlington, N.J	Construct stoomline to an oil-fired plant in reception center and then remove coal-fired boiler in building 2604.
	Fort Hancock, Highlands, N.J	Change fuel from coal to gas with oil standby at central heating plant.
	Arlington Hall Station, Arlington, Va	Renovate and rebuild incinerators.
	Fort Belvoir, Fairfax County, Va	Fuel conversion to natural gas with low-sulfur fuel oil as standby for 2 boilers using coal (10-100 M B.T.U. per hour).
	Fort McNair, Washington, D.C	Replace underground gasoline storage tank and include submerged type fill pipe to prevent gasoline loss.
	Michigan missile plant, Warren, Mich	Conversion of 2 boilers to gas fuel from coal.
Navy	Naval Air Station, Alameda, Calif	Provide pressure breather valves for aviation gas storage tanks 97A to 97E; set control at 2.5 p.s.i. Phase out tanks 342A and 342B, fiscal year 1972 or sooner.
	Marine Corps Supply Center, Barstow, Calif	Install on-station sanitary landfill to replace open-pit burning.
	Naval Weapons Station, Concord, Calif	Provide multichamber incinerator with afterburner or install a wet pulping system.
	San Francisco Bay Naval Shipyard, Hunters Point, San Francisco, Calif.	Provide 2 direct flame afterburners for bake ovens in building 211 and building 271. Design and engineering studies to replace a dry pulp paper disintegrator with a wet pulping system.
	San Francisco Bay Naval Shipyard, Mare Island, Vallejo, Calif.	Improve ventilation of building 53. Increase frequency of cleanout of oil scrubber and replace filter pads in the scrubber more frequently. These changes are directed at odor control from rubber milling operations.
	Fleet Training Center, Naval Station, San Diego, Calif	Construct air pollution control system to eliminate smoke from this activity.
	Naval Fuel Depot, San Pedro, Calif	Installation of a vapor collection and flare system to collect and burn vapors during filling operations for a truck loading facility and four fuel storage tanks.
	Naval Station, Treasure Island, San Francisco, Calif	Engineering study to provide baghouse filter on cyclone exhaust from a classified paper disintegrator at building 649.
	Marine Corps Air Station, Kaneohe Bay, Honolulu, Hawaii.	Install sanitary landfill to replace open burning dump.
	Fleet Training Group, Pearl Harbor, Honolulu, Hawaii	Design smoke abatement facility for firefighting training school.
	Naval Ordnance Station, Forest Park, Ill	Design new incinerator with air pollution control equipment.
	Naval Training Center, Great Lakes, Ill	Install afterburner system to eliminate smoke from the firefighting training school.
	Naval Air Station, Olathe, Kans	Design smoke control system for firefighting training operation.
	Naval Shipyard, Boston, Mass	Design high-efficiency collector to control particulates from powerplant.
	Naval Communications Station, Cheltenham, Md	Install wet scrubber to control emissions from refuse incinerator.
	Naval Ship Research and Development Center, Carderock, Md.	Install smoke detectors on heating plant in building 6.
	Naval Ammunition Depot, Earle, N.J	Convert from No. 4 residual fuel oil to No. 2 distillate oil; eliminate open burning and dispose of lumber by a chipper.
	Naval Air Station, Brooklyn, N.Y	Convert from No. 6 and No. 4 residual fuel oil to No. 2 distillate in building No. 5 and building No. 4, respectively.
	Naval Hospital, St. Albans, N.Y	Convert from No. 6 residual fuel oil to No. 2 distillate oil in building 64.
	Naval Supply Center, Craney Island, Norfolk, Va	Installation of smoke detectors and alarms on boilers; provide waste oil destruction to replace waste oil pit, construct new incinerator or burn in city incinerator.
	Naval Damage Control Training Center, Philadelphia, Pa.	Construct smoke elimination system for this fire center.

Corps of Engineers (civil functions)	Potomac and Anacostia Rivers, Washington, D.C.	Install incinerator to dispose of drift and debris collected from these rivers. May be open-pit type or mounted on a barge. Decision rests upon prototype open-pit device operation at Caven Point, N.J.
	Baltimore Harbor, Baltimore, Md. (drift removal)	Install overfire air pit incinerator at Fort McHenry.
	Puget Sound and tributary waters, Washington, D.C. (harbor debris disposal).	Continue interim landfill operation and conduct engineering study to determine best solution.
	Dipper dredge "Kewaunee," Lake Michigan	Install smoke detector, alarm, or recorder on vessel.

[1] Tentative listing supplied by the Bureau of the Budget, Dec. 27, 1968.

APPENDIX B

SUMMARY OF REMEDIAL ACTIONS BY FEDERAL DEPARTMENTS OR AGENCIES, FISCAL YEAR 1968

Department or agency	Progress reports	Remedial actions	Stopped open burning or poor incineration	New or upgraded incinerators	Replacement of heating plants	Existing heating plants improved	New or improved particulate collectors	Smoke or other monitor systems installed	Using lower sulfur content coal or fuel oil	Converted heating plant from coal or oil to gas	Converted to electricity	Reduced chemical or vapor emissions	Other[1]
Grand total	387	442	126	9	14	7	8	16	103	37	1	31	90
Defense:													
Army	88	115	25	3	1	1	3	4	56	3		7	32
Navy	67	84	7		1		2	1	5	2		15	9
Air Force	30	43	13	2	1	3						6	
Supply Agency	1	1	1										
Corps of Engineers	1	1											
Atomic Energy Commission	15	20	3	1		1	1	3	1			2	8
Commerce	3	4							2	1			1
General Services	13	14							7	1			1
Health, Education, Welfare	11	11	1	2					4	2			1
Interior	11	12							1				1
Justice	20	2											1
National Aeronautics and Space	3	3								1			1
Post Office	69	69	66										1
Smithsonian Institution	1	1	1								1	1	1
Tennessee Valley Authority	6	7					2			2			1
Transportation	4	4	2							17			1
Veterans' Administration	34	36	3	1	10								

[1] "Other action" includes studies, designs, and project cost estimates completed or underway. It also includes contracts awarded or advertised for bid.

APPENDIX C

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968

Agency	Installation	Actions
Department of Defense:		
Defense Supply Agency	Defense Supply Support Center, Philadelphia, Pa.	Conversion of steam boiler to gas-oil firing completed February 1968.
Army	Fort McClellan, Anniston, Ala.	Open burning discontinued during fiscal year 1968.
	Redstone Arsenal, Huntsville, Ala.	Installed vapor emission control devices in nine tanks during fiscal year 1968.
	Fort Rucker, Daleville, Ala.	10 coal-fired boilers replaced or converted to oil or gas during fiscal year 1968.
		28 furnaces converted to oil or gas.
	Fort Richardson, Anchorage, Alaska	Construction contract awarded January 1968. Completion scheduled for October 1968.
	Fort Wainwright, Fairbanks, Alaska	Open burning discontinued and sanitary landfill established in fiscal year 1968.
	Yuma Proving Grounds, Yuma, Ariz.	Open burning discontinued and sanitary landfill established.
		Vapor emission controls installed on all gasoline storage tanks during fiscal year 1968.
	Fort Chaffee, Fort Smith, Ark.	Open burning discontinued and sanitary landfill established during fiscal year 1968.
	Pine Bluff Arsenal, Pine Bluff, Ark.	Open burning and white phosphorous slag eliminated (shipping slag to TVA). Renovating incinerator—contract awarded February 1968. Operation scheduled for fiscal year 1969. Design study for criteria and cost estimate completed December 1967. Preliminary survey chlorine manufacture facility made in July 1967.
	Hunter Liggett Military Reservation, Jolon, Calif.	Sanitary landfill for refuse disposal established during fiscal year 1968.
	Fitzsimmons General Hospital, Aurora, Colo.	Discontinued use of one incinerator during fiscal year 1968.
	Rocky Mountain Arsenal, Denver, Colo.	3 monitoring stations installed March 1968. Submerged inlets on 2 storage tanks, fiscal year 1968.
	Fort Leslie J. McNair, Washington, D.C.	Residual fuel oil with a maximum sulfur content of 2 percent has been used since July 1, 1967.
	Walter Reed Army Medical Center (Main), Washington, D.C.	Do.
	Atlanta Army Depot, Forest Park, Ga.	Submerged inlets installed on oil underground tanks during fiscal year 1968.
	Fort Gordon, Augusta, Ga.	256 coal-fired furnaces removed from construction area. 4 gasoline tanks removed during fiscal year 1968.
	Fort McPherson, Atlanta, Ga.	Open burning discontinued. Waste disposed off post.
	Chicago USAR Center No. 1 (Mankato), Chicago, Ill. (East 71st St.)	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967.
	Chicago USAR Center No. 2 (Gibson), Chicago, Ill. (West Cermak Rd.).	Do.
	Chicago USAR Center No. 3 (Lincolnwood), Chicago, Ill. (North Kedzie Ave.).	Do.
	Chicago USAR Center, Chicago, Ill. (South Cornell St.)	Do.
	Chicago USAR Center, Chicago, Ill. (South Exchange Ave.).	Do.
	Joliet Army Ammunition Plant, Joliet, Ill.	Preliminary engineering studies made on control of emissions from manufacturing processes. Negotiating design contract for upgrading coal-fired heating plants. Soliciting lower sulfur coal and oil.
	Missile site C-80, Arlington Heights, Ill.	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967.
	Rock Island Arsenal, Rock Island, Ill.	Installed ½ of the abatement devices planned for metal plating shop in fiscal year 1968.
	Fort Sheridan, Highland Park, Ill.	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967. Construction contract awarded January 1968 to convert heating plant from coal to gas. Completion date November 1968.

1490

APPENDIX C—Continued

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installation	Actions
Department of Defense—Continued		
Army—Continued		
	Waukegan USAR Center, Waukegan, Ill.	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967.
	Camp Atterbury, Edinburg, Ind.	Open burning discontinued.
	Sunflower Army Ammunition Plant, Lawrence, Kans.	Open burning of uncontaminated waste discontinued and landfill established fiscal year 1968. Awarded design contract Apr. 30, 1968 to convert steam plant from coal to natural gas and No. 2 fuel oil standby.
	Fort Knox, Louisville (Hardin, Meade, Bullitt Counties) Ky.	Open burning discontinued in fiscal year 1968.
	Army Map Service, Brookmont, Md.	Residual fuel oil containing maximum of 2 percent sulfur used since July 1, 1967.
	Fort George G. Meade, Odenton, Md.	Smoke detectors and recorders installed on 10 boilers during fiscal year 1968.
	Walter Reed Army Medical Center Annex, Forest Glen, Md.	Residual fuel oil containing maximum of 2 percent sulfur has been used since July 1, 1967.
	Boston Army Base, Boston, Mass.	Smoke detectors installed on 6 boilers in the Central Boiler Plant September 1967.
	Fort Devens, Ayer, Mass.	Incinerators have been inactivated during fiscal year 1968.
	Fort Leonard Wood, Waynesville, Mo.	Contract awarded to convert 8 coal-fired boilers and 181 coal-fired heating systems to oil-fired before 1969-60 heating season.
	Fort Missoula, Missoula, Mont.	Eight coal-fired boilers changed to gas in fiscal year 1968.
	Bayonne military ocean terminal, Bayonne, N.J.	Fuel oil procured for use after May 1, 1968, will meet New Jersey State limit for sulfur content.
	Burlington Army ammunition plant, Burlington, N.J.	Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Camden USAR Center, Camden, N.J.	Fuel oil containing maximum sulfur content of 1 percent in use since Nov. 1, 1967. Oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Dix, Wrightstown, N.J.	Fuel oil containing 1 percent sulfur in use since Nov. 1, 1967. Procuring anthracite with 0.9 percent sulfur content for use in fiscal year 1969. Bituminous coal for use in fiscal year 1969 to contain 1 percent maximum sulfur. Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Hancock, Highlands, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent maximum sulfur content. Procuring bituminous coal with maximum sulfur content of 1 percent for fiscal year 1969. Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Kearny USAR Center, Kearny, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum. Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Camp Kilmer, Edison, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum. Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Alexander Hamilton USAR Center, Lodi, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum. Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Monmouth, Eatontown, N.J.	All open burning discontinued as of May 22, 1967, and refuse buried in landfill. Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur and oil procured after May 1, 1968, will meet New Jersey State sulfur limits. Coal procured for use in fiscal year 1969 will contain 1 percent sulfur in bituminous and 0.9 percent in anthracite.
	Fort Monmouth Subpost, Charles Wood Area, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur and oil procured after May 1, 1968, will meet New Jersey State sulfur limits. Procuring anthracite containing 0.9 percent sulfur for use in fiscal year 1969.
	Sgt. J. J. Sadowski USAR Center, Newark, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur and oil procured after May 1, 1968, will meet New Jersey State sulfur limits.

Nixon USAR Center, Nixon, N.J.	Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limits.
Picatinny Arsenal, Dover, N.J.	Discontinued open burning and use of incinerator. Landfill established. Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur, and oil procured for use after May 1, 1968, will meet New Jersey State sulfur limits. Bituminous coal for use in fiscal year 1969 being procured with maximum sulfur content of 1 percent. Design contract being negotiated for fuel conversion to gas.
Philadelphia Air Defense Site, Pedricktown, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur, and oil procured after May 1, 1968, will meet New Jersey State sulfur limits.
Trenton USAR Center, Trenton, N.J.	Fuel oil procured for use after May 1, 1968, will meet New Jersey State sulfur limits.
Fort Wingate Army Depot, Gallup, N. Mex.	Open burning replaced by landfill in March 1967. Construction contract awarded Apr. 30, 1968, to convert coal-fired boilers to gas.
Army Pictorial Center, New York City (Long Island City), N.Y.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.
Brooklyn military ocean terminal, New York (Kings County), N.Y.	Fuel oil used after May 31, 1968, will contain 1 percent sulfur maximum.
Fort Hamilton, Brooklyn, N.Y.	Smoke recorders installed on 3 boilers. Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum. Design contract being negotiated for upgrading incinerators.
Brig. Gen. T. Roosevelt, Jr. USAR Center, Hempstead, N.Y.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.
Miller Army Airfield, Staten Island, N.Y.	Do.
Sgt. Joseph E. Muller USAR Center, New York City (East 238th St.), N.Y.	Do.
S. Sgt. V. Q. Kelly USAR Center, New York City (West 42d St.), N.Y.	Do.
2d Lt. Thomas J. McDonald USAR Center, New York City (Gothals Ave., Jamaica), N.Y.	Do.
Seneca Army Depot, Romulus, N.Y.	Changed from coal firing to oil burners on 3 boilers (building 319) during fiscal year 1968.
Fort Tilden USAR Center, New York City, N.Y.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.
Fort Totten, New York City, N.Y.	Inactive status since July 31, 1967.
USA Directorate General Support Maintenance Activity, Bellmore, N.Y.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.
Fort Wadsworth, New York City, N.Y.	Do.
Watervliet Arsenal, Watervliet, N.Y.	Open burning discontinued during fiscal year 1968. Wastes removed by contract.
Fort Bragg, Fayetteville, N.C.	Open burning discontinued during fiscal year 1968.
Umatilla Army Depot, Hermiston, Oreg.	Open burning discontinued and landfill established as of May 1, 1968. Incinerator plans canceled.
Frankford Arsenal, Philadelphia, Pa.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.
Norristown USAR Center, Norristown, Pa.	Anthracite containing 0.9 percent sulfur being procured for use in fiscal year 1969.
Valley Forge General Hospital, Phoenixville, Pa.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.
Horsham USAR Center, Willow Grove, Pa.	Do.
Camp Bullis, San Antonio, Tex.	Open burning discontinued on July 1, 1967, and sanitary landfill established.
Fort Hood, Bell and Coryell Counties, Tex.	Do.
Fort Sam Houston, San Antonio, Tex.	Do.
Red River Army Depot, Texarkana (Bowie County), Tex.	Rubber previously burned is now stockpiled for future sale. Submerged inlets installed on 2 tanks during fiscal year 1968.
Camp Stanley, San Antonio, Tex.	Open burning discontinued on July 1, 1967, and sanitary landfill established.
Fort Wolters, Mineral Wells, Tex.	1 paper pulper installed March 1968.
Arlington Hall Station, Arlington, Va.	Residual fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
Fort Belvoir, Mount Vernon, Va.	Do.
Cameron Station, Alexandria, Va.	Do.
Fort Lee, Fort Lee, Va.	2 fuel conversions (coal to oil) were accomplished. Design completed for proposed conversion to gas with oil standby.

APPENDIX C—Continued

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installation	Actions
Department of Defense—Continued		
Army—Continued		
	Fort Myer, Arlington, Va	Residual fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Vint Hill Farms Station, Warrenton, Va	Replaced the 3 classified waste incinerators with 1 Smokatrol unit and 6 gas afterburners.
	Fort Lewis, Tacoma, Wash	250 worn-out coal-fired furnaces replaced with oil-fired units in fiscal year 1968.
	Yakima Firing Center, Yakima, Wash	Open burning discontinued and sanitary landfill established in fiscal year 1968.
	Holston Army ammunition plant, Sullivan and Hawkins Counties, Tenn.	Engineering study, 90 percent complete, for control of particulates from 13 boilers in coal-fired heating plants.
	Volunteer Army ammunition plant, Chattanooga, Tenn.	Pending modernization of this old plant, a variety of emission reduction devices are being installed, requested, or studied.
Corps of Engineers	New York Harbor drift removal project, New York district office, New York, N.Y.	Design complete contract let and construction complete for developing the area; 3 contracts let for long-lead construction (fans, motors, hoists, transformers); contract for general construction of incinerator proper now out for bids.
	Derrick boat "Tonawanda," Cleveland, Ohio (home port).	New burners installed permitting use of No. 2 distillate fuel in lieu of No. 6 previously used.
Navy	Naval Air Station, Alameda, Alameda, Calif	Submerged inlets for motor gasoline storage tanks. June 30, 1968, expected completion date.
	Naval Weapons Station, Concord, Concord, Calif	Submerged inlets for motor gasoline storage tank. June 30, 1968, expected completion date.
	Naval Air Station, Lemoore, Lemoore, Calif	Open burning discontinued and on-station sanitary landfill established May 1967. Submerged inlets for motor gasoline tanks completed January 1968.
	Naval Station, Long Beach, Long Beach, Calif	Paper pulper installed November 1967.
	Naval Air Station, Moffett Field, Sunnyvale, Calif	Incineration of garbage discontinued. Hauled away by contract. Submerged inlets on motor gasoline storage tanks by June 1968.
	Naval Postgraduate School, Monterey, Monterey, Calif.	Open burning discontinued. Now using off-station landfill. Submerged inlets on motor gasoline storage tanks in June 1968.
	Naval Hospital, Oakland, Oakland, Calif	Submerged inlets on motor gasoline storage tanks to be completed by June 30, 1968.
	Naval Supply Center, Oakland, Oakland, Calif	Firebrick and grate completed March 1968. Submerged inlets on motor gasoline storage tanks to be completed by June 30, 1968.
	Naval Facility, Point Sur, Big Sur, Calif	Submerged inlets on motor gasoline storage tanks to be completed by June 30, 1968.
	Fleet Training Center, Naval Station, San Diego, Calif	Contract for preparation of 30 percent final plans and specifications will be let before June 30, 1968. Architect-engineer selected.
	San Francisco Bay Naval Shipyard, Hunter Point Site, San Francisco, Calif.	Boiler plants in buildings 521 and 203 converted to interruptible natural gas in May and October 1967. Submerged inlets on motor gasoline storage tanks to be completed by June 30, 1968.
	San Francisco Bay Naval Shipyard, Mare Island Site, Vallejo, Calif.	Powerplant, building 121 converted to natural gas, June 25, 1967. Submerged inlets on motor gasoline tanks to be completed by June 30, 1968.
	Naval Communication Station, Stockton, Calif	Submerged inlets on motor gasoline storage tanks to be completed June 30, 1968.
	Naval Station, Treasure Island, San Francisco, Calif	Smoke elimination facility contract awarded Jan. 19, 1968. Boiler contract awarded in April 1968. Submerged inlets on motor gasoline tanks to be completed by June 30, 1968.
	Naval Research Laboratory, Washington, D.C	Smoke detectors ordered for installation in summer of 1968.
	Naval Air Station, Key West, Key West, Fla	In-house study of refuse disposal practice completed.
	Naval Station, Key West, Key West, Fla	In-house study of refuse disposal in Key West area completed. (Central incinerator for all area naval activities recommended.)

Marine Corps Supply Center, Albany, Albany, Ga.....	Engineering study complete. (Recommends sanitary landfill to replace 2 open-burning dumps.)
Naval Air Station, Barber's Point, Barber's Point, Honolulu, Hawaii.	Final plans and specifications being prepared for sanitary landfill.
Naval Ordnance Station, Forest Park, Ill.....	Fuel procured since Nov. 1, 1967, has contained a maximum of 1 percent sulfur.
Naval Air Station, Glenview, Ill.....	Do.
Navy Public Works Center, Great Lakes, Great Lakes, Ill.	Contract awarded for firm gas for the main powerplant effective Nov. 1, 1968, for 55 percent of annual fuel. Contract awarded for design of control devices for main powerplant. Fuel used since Nov. 1, 1967, has had a limit of 1 percent sulfur.
Naval Training Center, Great Lakes, Great Lakes, Ill..	Project cost estimate completed for firefighting school smoke elimination facility.
Public Works Center, Guam, Orote Point, Guam.....	Plans completed for a sanitary landfill.
U.S. Naval Academy, Annapolis, Md.....	New heating plant under construction. Estimated completion date, November 1968.
Naval Research Laboratory, Chesapeake Beach, Md....	Smoke detectors ordered.
Naval Ordnance Laboratory, Silver Spring, Md.....	Design project underway (to control incinerator smoke).
Naval Shipyard, Boston, Boston, Mass.....	Project cost estimate completed Aug. 15, 1967, for boiler smoke control and refuse disposal.
Naval Auxiliary Air Station, Fallon, Nev.....	Open-burning discontinued; contract refuse hauling to on-station landfill operated by Seabees. Submerged inlets on motor gasoline storage tanks to be completed by June 30, 1968.
Naval Ammunition Depot, Hawthorne, Hawthorne, Nev.	Submerged inlets on motor gasoline storage tanks to be completed June 30, 1968.
Goldsborough Housing (part of Supply Center) Bayonne, N.J.	Design completed fiscal year 1968. Disestablishment anticipated June 30, 1968. Installation will be under Army.
Reserve Training Center, Clifton, N.J.....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum.
Ammunition Depot, Earle, N.J.....	Do.
Reserve Training Center, Elizabeth, N.J.....	Do.
Reserve Training Center, Jersey City, N.J.....	Do.
IND Reserve Shipyard, Newark, N.J.....	Do.
Reserve Training Center, Freeport, N.J.....	Do.
Headquarters, 1st Marine Corps District, Garden City, N.Y.	Do.
Mitchel Manor, Federal Housing Annex of Naval Station, Brooklyn, Garden City, N.Y.	Do.
Reserve Training Center, Huntington, N.Y.....	Do.
Naval and Marine Corps Reserve Training Center, Fort Schuyler, N.Y., Bronx, New York.	Do.
Shipyard (Naval Station, Brooklyn) Brooklyn, Kings County, N.Y.	Design authorized for special project A1-68 (incinerator scrubbers).
Marine Corps Reserve Training Center, New York City, N.Y.	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum.
Naval Air Station, New York, Brooklyn, N.Y.....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Plans and specifications completed for boiler replacement building 4-B. Project cost estimate completed for fuel conversion of 3 boilers in fiscal year 1968. MCON project will include branch gas piping to tenant activity.
Hospital, St. Albans, St. Albans, Queens County, N.Y...	Fuel used since Nov. 1, 1967, has contained 1 percent sulfur maximum. Special project with certificate of urgency approved by EASTDIV for scrubber and modifications in fiscal year 1968. Project cost estimate completed for boiler conversion in fiscal year 1968.
Reserve Training Facility, Youngstown, N.Y.....	Special project completed in fiscal year 1968, EASTDIV approval anticipated in May 1968.
Naval Air Development Center, Johnsville, Pa.....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Negotiations underway for selecting A. & E. firm to prepare project cost estimate (smoke control).

APPENDIX C—Continued

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installation	Actions
Department of Defense—Continued		
Navy—Continued		
	Naval Supply Depot, Mechanicsburg, Pa	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Fuel selection survey completed and awaiting preparation of project for funding.
	U.S. Marine Corps Supply Activity, Philadelphia, Pa	Fuel selection survey submitted to Marine Corps Supply Activity which has obtained 1 percent sulfur fuel oil since Nov. 1, 1967.
	Naval Air Engineering Center, Philadelphia, Pa	Fuel selection survey completed and awaiting funding. Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum.
	Naval Damage Control Center, Philadelphia, Pa	Engineering investigation underway to determine most feasible method of eliminating firefighting school.
	U.S. Naval Hospital, Philadelphia, Pa	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Negotiation underway for selection of A. & E. firm to prepare project cost estimate.
	Naval Shipyard, Philadelphia, Pa	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Negotiations underway for selection of A. & E. firm to prepare project cost estimate for control of fly ash and smoke.
	Naval Supply Depot, Philadelphia, Pa	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Authorized to start plans and specifications for heating plant fuel conversion.
	Naval Air Station, Willow Grove, Willow Grove, Pa	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Project for new boilers using low sulfur fuel approved.
	U.S. Naval Station, Roosevelt Roads, Ceiba, Humacao, P.R.	Construction underway to install emission control valves and filters in exhaust fans, June 1968 expected completion date.
	U.S. Marine Corps, Camp Garcia detachment, Isabel II-Vieques, P.R.	Sanitary landfill implemented.
	Fleet Training Center, Newport, Newport, R.I	Project cost estimate completed Aug. 4, 1967 (smoke control at fire fighting school).
	Public Works Center, Newport, Newport, R.I	Project cost estimate for incinerator completed Aug. 15, 1967. Project cost estimate for fly ash collectors completed June 2, 1967.
	Naval Shipyard, Charleston, Charleston, S.C	Open burning discontinued and refuse disposed in sanitary landfill. A. & E. working on program cost estimate for dust collector.
	Naval Supply Center, Craney Island, Norfolk, Va	Installation of smoke recorders and alarms on heating plant to be completed by June 1968. A. & E. study underway regarding waste oil disposal problem. Exploring refuse disposal by contract.
	Naval Public Works Center, Norfolk, Va	Preliminary design complete for particulate control devices for waste heat plant. Smoke detectors being designed for buildings P-1 and SU-1.
	Naval Supply Center, Norfolk, Va	Completed installation of vacuum pressure relief valve on fuel tank September 1967.
	Naval Air Station, Oceana, Virginia Beach, Va	Smoke detectors for housing area heating plant to be installed before June 30, 1968.
	Naval Ammunition Depot, St. Juliens Creek, Portsmouth, Va.	Smoke detectors, recorders, and alarms have been installed.
	Naval Hospital, Portsmouth, Va	Smoke detectors and alarms installed in April 1968.
	Norfolk Naval Shipyard, Portsmouth, Va	Smoke detectors installed at Stanley Courts and building 174 heating plant.
Air Force	Perrin Air Force Base, Sherman, Tex	Open burning eliminated with landfill. When available land is exhausted, then refuse hauling contract will be prepared.
	Lackland Air Force Base, San Antonio, Tex	Have requested shredder-pulper to replace classified paper incinerator.
	Elmendorf Air Force Base, Anchorage, Alaska	Contracted January 1968 to convert from use of coal to natural gas. Expect completion by October 1968.

Williams Air Force Base, Chandler, Ariz.	Improvements in auto maintenance shop scheduled for fiscal year 1969. Submerged inlets on 3 50,000-gallon tanks.
McClellan Air Force Base, Sacramento, Calif.	Waste lumber disposal contract expected to be completed by June 1968.
Vandenberg Air Force Base, Santa Barbara County, Calif.	Vapor recovery valves on 4 underground fuel storage tanks.
Lowry Air Force Base, Denver, Colo.	Dustless ash handling equipment installed at heating plant during 3d quarter fiscal year 1968. Refuse disposal accomplished by sanitary landfill operation.
Robins Air Force Base, Warner Robins, Ga.	Building 230 connected to central heating plant, thereby eliminating 1 furnace problem. Open burning of scrap lumber temporarily terminated by salvage and landfill operation. Available land is limited so incinerator planned for fiscal year 1972.
Belleville Air Force Station, Belleville, Ill.	Remedial action not required. Phaseout scheduled for July 1968.
Chanute Air Force Base, Rantoul, Ill.	Open burning discontinued and sanitary landfill established July 1967.
Henna City Air Force Station, Henna City, Ill.	Remedial action not needed; phaseout scheduled for July 1968.
Sioux City Airbase, Sioux City, Iowa	Remedial action not required. Facilities being turned over to ANG and Sioux City effective September 1968.
Snow Mountain Air Force Station, Fort Knox, Ky.	Cyclone separator no longer needed. Phaseout scheduled for July 1968.
Barksdale Air Force Base, Bossier City, La.	Classified waste disintegrator installed. Construction scheduled to start before Dec. 31, 1968, on nonpollutant waste disposal system for a new composite medical facility. Design underway.
Andrews Air Force Base, Camp Springs, Md.	Contract for off-base refuse disposal eliminates need for incinerator. Design underway to convert boilers in building 1515 to oil.
L. G. Hanscom Field, P.I.N. 1949, Bedford, Mass.	Smoke detection and recorder system accomplished in December 1967.
Westover Air Force Base, Chicopee, Mass.	Open burning eliminated with sanitary landfill. Close monitoring of heat plant operation.
Calumet Air Force Base, Calumet, Mich.	A. & E. design underway for plant expansion and fuel conversion.
Port Austin Air Force Station, 80 miles southeast of Saginaw, Mich.	Fuel conversion to natural gas included in project to enlarge plant. Expected completion date September 1968.
Selfridge Air Force Base, Mount Clemens, Mich.	Design in progress for fuel conversion to natural gas to be effected in early 1969.
Keesler Air Force Base, Biloxi, Miss.	Installation of submerged inlet lines in 500-gal. gasoline storage tanks. Completed November 1967.
Aeronautical Chart and Information Center, St. Louis, Mo.	Design completed and construction contract awarded in April 1968 for combination shredder-incinerator. Facility expected to be in operation by September 1968.
Kirksville Air Force Station, Kirksville, Mo.	Phaseout scheduled September 1968.
Omaha Air Force Station, Omaha, Nebr.	Do.
McGuire Air Force Base, Burlington County, N.J.	Low sulfur No. 4 fuel oil purchased for building 33-42. New boilers fired with No. 2 fuel oil installed for buildings 27-43, 27-35, 28-19, and 28-34.
National Guard Air Base, Floyd Bennett Field, N.Y.	ANG procuring low sulfur fuel oil to comply with emissions standards.
Plattsburgh Air Force Base, Plattsburgh, N.Y.	Open burning discontinued. Refuse now deposited in sanitary landfill.
Fortuna Air Force Station, Fortuna, N. Dak.	Design for new boilers completed; advertised for bid.
Grand Forks Air Force Base, Emerado, N. Dak.	Fuel conversion from coal to oil scheduled for July 1, 1968.
Minot Air Force Station, Minot, N. Dak.	Design completed and project authorized for bid advertisement. (Conversion of heating plant to gas.)
Lockbourne Air Force Base, ANG Facility, Columbus, Ohio.	Purchasing low sulfur oil to comply with emission standards.
Wright-Patterson Air Force Base, Green County, Ohio.	New incinerator installed in building 305, area B. Replaced all cones on mechanical collector for No. 2 boiler CHP 1240 (HTW). Contaminated POL to be sold rather than burned on base.
Altus Air Force Base, Altus, Okla.	Refuse disposed off base in sanitary landfill operation.
Kingsley Field, Klamath Falls, Oreg.	Submerged inlets on fuel tanks installed.
Greater Pittsburgh Airport, Pittsburgh, Pa.	Submerged inlets on fuel tanks.
Willow Grove Air Reserve Facility, Willow Grove, Pa.	No. 6 fuel oil containing 0.8 percent sulfur now being procured. Seeking oil containing 0.6 percent sulfur.

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installation	Actions
Department of Defense—Continued		
Air Force—Continued		
	Carswell Air Force Base, Fort Worth, Tex.	Open burning of refuse eliminated using sanitary landfill. Commissary incinerator being used by base communications.
	Kelly Air Force Base, San Antonio, Tex.	Reclamation smelter has ceased operation.
	Hill Air Force Base, Ogden, Utah	Upgraded control equipment on classified document incinerator.
Atomic Energy Commission	National Reactor Testing Station, Bingham County, Idaho.	1 photoelectric unit with alarm system installed on steam plant at EBR II site.
	Argonne National Laboratory, Du Page County, Ill.	Requested funds to convert plant to natural gas. Funds denied by Joint Committee on Atomic Energy.
	Burlington plant, Des Moines, Iowa	Contract for engineering and design let on May 1, 1968, to convert steam plant from coal to natural gas and standby fuel oil. To be completed by October 1969.
	Paducah Gaseous Diffusion Plant, Paducah, Ky.	Work started on rebuilding electrostatic precipitators on steam plant C-600.
	Bendix plant, Kansas City, Mo.	Equipment ordered to install gas afterburner and flue gas washer with stack damper in classified waste destructor in April 1969. Completion scheduled August 1969.
	Brookhaven National Laboratory, Suffolk County, N.Y.	Requested funds to convert steam plant to natural gas. Request denied by Joint Committee on Atomic Energy.
	Knolls Atomic Power Laboratory, Schenectady County, N.Y.	Changed fuel oil contract to less than 2 percent sulfur oil. Installed submerged filling inlet on 10,000-gal. storage tank. Currently establishing offsite disposal of wastes to replace open burning.
	Oak Ridge Operations Feed Materials Production Center, Fernald, Ohio.	Smoke density recorders installed in 3 of 4 stacks. Studies of electrostatic precipitator operation underway to determine compliance with Executive Order 11282.
	Oak Ridge Operations Office, Portsmouth Area Gaseous Diffusion Plant, Portsmouth, Ohio.	Stack sampling and other studies involving fuels still underway to evaluate economics of various remedial measures including electrostatic precipitation, smoke density recorders, and fly ash equipment.
	Savannah River Operations Office, Savannah River Plant, Aiken and Barnwell Counties, S.C.	Sanitary landfill being developed to eliminate open burning. Study regarding need for electrostatic precipitators in progress.
	Oak Ridge National Laboratory, Oak Ridge, Tenn.	Vapor recovery and control system installed to control gasoline vapor loss.
	Oak Ridge Operations, Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tenn.	Funds budgeted for installation of smoke density recorders. Steam plant being studied regarding need for electrostatic precipitators and smoke density recorders.
	Oak Ridge Operations, Oak Ridge Steam Plant, Building 1916-T-2A, Oak Ridge, Tenn.	Study underway to determine feasibility of installing gas-fired boilers to eliminate smoke problem in residential area.
	Pantex plant, Amarillo, Tex.	Sanitary landfill operation installed to eliminate open burning of 3.6 tons of refuse per day.
	Richland Operations Office, Hanford Reservation, Adams, Benton, Grant, and Franklin Counties, Wash.	17 smoke density monitors have been procured for use of this plant.
General Services Administration	Federal Center Building 47, Denver, Colo.	Fuel conversion construction contract awarded in April 1968. Completion scheduled for Nov. 15, 1968. Converting from coal to gas and No. 2 fuel oil.
	Englewood Postal Station, Chicago, Ill.	Fuel conversion project out on bid. Coal to gas heating plant.
	Post Office and Courthouse, Albany, N.Y.	Funds requested for conversion to gas and No. 2 oil. Design completed.
	Bronx Central Station Post Office, Bronx, N.Y.	Project for conversion to No. 2 oil underway.
	Federal Office Building, 26th St. and 3d Ave., Brooklyn, N.Y.	Conversion of boilers to gas and No. 2 fuel oil underway. Completion date, Oct. 1, 1968.
	Federal Office Building, 35 Ryerson St., Brooklyn, N.Y.	Do.
	Post Office, Flushing, N.Y.	Do.
	Post Office, Jamaica, N.Y.	Do.

	Madison Square Post Office, New York, N.Y.	Do.
	Federal Office Building, 641 Washington St., New York, N.Y.	Do.
	Post office, Rochester, N.Y.	Conversion of boilers to gas and No. 2 fuel oil initiated.
	North Philadelphia Postal Station, Philadelphia, Pa.	Conversion of boiler from No. 4 to No. 2 oil completed.
	5000 Wissahickon Ave., Philadelphia, Pa.	Conversion of boiler to gas and No. 2 fuel oil underway.
Department of Commerce	National Bureau of Standards, Gaithersburg, Md.	Contract has been let for conversion of heating plant to gas and standby fuel oil.
	Hoboken terminal, Hoboken, N.J.	Property is under lease to Port of New York Authority. Authority has budgeted to convert to No. 2 fuel oil in summer of 1968.
	U.S. Merchant Marine Academy, Kings Point, Long Island, N.Y.	Lower sulfur fuel oil now being used. A contract has been let to study the feasibility of using a combination gas-oil fired high-pressure boiler or converting to No. 2 fuel oil.
Department of Health, Education, and Welfare: Public Health Service.	Indian hospital, Phoenix, Ariz.	Multiple chamber incinerator has been installed replacing single chamber unit.
	Outpatient clinic, Chicago, Ill.	Converted to low sulfur No. 6 oil.
	PHS hospital, Lexington, Ky.	Open burning discontinued and sanitary landfill operating.
	Northeastern Radiological Health Laboratory, Winchester, Mass.	Bids on market to obtain lower sulfur fuel oil.
	PHS hospital, Boston, Mass.	Do.
	PHS hospital, Staten Island, N.Y.	Converted to No. 2 fuel oil. Design for eventual conversion to gas is 90 percent complete.
	Quarantine station, Staten Island, N.Y.	Converted to No. 2 fuel oil.
	Outpatient clinic, Philadelphia, Pa.	Converting to lower sulfur fuel oil.
	Northeast Marine Health Sciences Laboratory, Narragansett, R.I.	Invitation to bid is on the market for lower sulfur fuel oil.
	PHS hospital, Norfolk, Va.	Converted to No. 2 fuel oil.
	St. Elizabeth's Hospital, Washington, D.C.	Contracts awarded for smoke meters on boilers, installation of afterburner, barometric damper, overfire ventilation, and burners in main incinerator.
Department of Transportation	Gloucester Coast Guard Base, Gloucester City, N.J.	Heating system converted from No. 5 residual fuel oil to No. 2 distillate oil.
	Coast Guard Training Center, Cape May, N.J.	Open burning of refuse has been discontinued. Refuse now compacted, collected, and disposed of by refuse service.
	New York Coast Guard Base, Governors Island, N.Y.	Partial conversion from residual fuel oil to No. 2 distillate fuel oil. Will be completed when funds are available.
	Elizabeth City Coast Guard Air Base, Elizabeth City, N.C.	Open burning of waste discontinued. Use of compactors and public disposal facilities accomplished.
Department of the Interior: Bureau of Indian Affairs	Mt. Edgecumbe Boarding School, Sitka, Alaska	Incinerator out on bid to eliminate open burning. Feasibility study in progress to determine modifications of heating plant.
	Chinle Agency Headquarters, Chinle, Ariz.	Stack sampling to be done to check emissions from No. 5 fuel oil.
	Hopi Indian Agency Headquarters, Keams Canyon, Ariz.	Preliminary investigation for heating plant modification to include air pollution abatement equipment has been made. An incinerator is being considered.
	Standing Rock Boarding School, Fort Yates, N. Dak.	Heating plant is being converted to No. 2 fuel oil.
	Seneca Indian School, Wyandotte, Okla.	Boilers have been replaced with liquefied petroleum gas fired units for each building. Coal fired boilers are abandoned.
	Oglala Community School, Pine Ridge, S. Dak.	Now converting centralized heating plant to No. 2 fuel oil.
	Kyle Day School, Pine Ridge, S. Dak.	Will be converted to No. 2 fuel oil for the heating plant.
	Pierre School, Pierre, S. Dak.	Now converting to No. 2 fuel oil for the heating plant.
	Intermountain School, Brigham City, Utah.	Scheduled to convert from coal to natural gas in fiscal year 1968.
	National Park Service, Grand Canyon National Park, Grand Canyon, Ariz.	Incinerators programed for 1971 and 1974 fiscal year for Desert View, North Rim, and South Rim.
Bureau of Sport Fisheries and Wildlife	Crab Orchard NWR, Carterville, Ill.	Parties operating 9 of 13 locations under lease with Bureau of Sport Fisheries and Wildlife, have been notified to comply with Executive Order 11282. 4 other installations are to use No. 2 fuel oil or gas. Open burning has been eliminated and a sanitary landfill installed.

APPENDIX C—Continued

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installation	Actions
Smithsonian Institution	National Zoological Park, Washington, D.C.	Planning funds made available to GSA for heating study preliminary to phasing-out coal plant and conversion to gas. Improvements made in stack gas washer on incinerator. Plans for all-weather operation of this scrubber being drawn.
Department of Justice: Bureau of Prisons	Federal Correctional Institution, Lompoc, Calif.	Engineering study planned for waste disposal practices.
	Southwest Regional Office, San Pedro (Terminal Island), Calif.	Converted from high sulfur fuel oil to No. 2 fuel oil.
	Federal Correctional Institution, Terminal Island, Calif.	Engineering study planned.
	Federal Youth Center, Englewood, Colo.	Engineering study planned for waste disposal practices.
	Federal Correctional Institution, Danbury, Conn.	Engineering study to be conducted concerning refuse disposal practices.
	Federal Correctional Institution, Tallahassee, Fla.	Engineering study planned concerning refuse disposal practices.
	U.S. Penitentiary, Marion, Ill.	Do.
	U.S. Penitentiary, Terre Haute, Ind.	Do.
	U.S. Penitentiary, Leavenworth, Kans.	Engineering study underway. Funds for 2 incinerators to be requested in fiscal year 1970 budget.
	Federal Youth Center, Ashland, Ky.	Engineering study planned concerning waste disposal practices.
	Federal Correctional Institution, Sandstone, Minn.	Do.
	Medical Center for Federal Prisoners, Springfield, Mo.	Do.
	U.S. Penitentiary, Lewisburg, Pa.	Do.
	Federal Correctional Institution, La Tuna, Tex.	Engineering survey planned concerning refuse disposal practices.
	Federal Correctional Institution, Seagoville, Tex.	Do.
	Federal Correctional Institution, Texarkana, Tex.	Do.
	Federal Reformatory, Petersburg, Va.	Engineering study to be conducted concerning refuse disposal practices, excessive smoking from boiler plant, need for new boilers which will be gas-fired or coal with suitable control equipment.
	U.S. Penitentiary, McNeil Island, Steilacoom, Wash.	Engineering study of waste disposal to be made.
	Federal Reformatory for Women, Alderson, W. Va.	Engineering study to be made on boiler plant and refuse disposal practices.
	National Training School for Boys, Morgantown, W. Va.	New facility. Engineering study planned for refuse disposal.
National Aeronautics and Space Administration	Michoud Assembly Facility, New Orleans, La.	Funds requested for design in fiscal year 1969. Scrubbers, filters, and incinerators needed for unspecified operations.
	Goddard Space Flight Center, Greenbelt, Md.	Design for gas conversion of boiler plant has been completed.
	Langley Research Center, Hampton, Va.	Study of heating plant completed. No remedial action required on that plant.
Post Office Department	Post office, Fort Wayne, Ind.	Converted heating plant to burn natural gas.
	See list of installations [1]	Trash removal contracts were instituted to eliminate open burning or faulty incinerator practices on premises of Post Office installations. The contracts specify that ultimate disposal of materials removed must comply with local air pollution control regulations.
Tennessee Valley Authority	National Fertilizer Development Center, Muscle Shoals, Ala.	Improvements reported affect the phosphate complex, ammonia complex, nitric acid complex, diammonium phosphate complex, nitrogen fertilizer complex and also reflect the establishment of a digital recording meteorological station as part of an air monitoring network. Specific improvements include reduction in dusts, fluorides, phosphorus oxides, ammonia, acids, and oxides of nitrogen. Further reduction of dusts and fluorides are scheduled for the current year.

	Colbert Steamplant, Colbert, Ala.	Efforts are being made to up-grade the efficiency of electrostatic precipitators at this plant. Ammonia injection for conditioning flue gas was unsuccessful.
	Widows Creek Steamplant, Stevenson, Ala.	Ammonia injection systems to condition flue gas at units 7 and 8 were installed and resulted in improved efficiency of electrostatic precipitators. Work being continued toward further improvement.
	Shawnee Steamplant, Paducah, Ky.	Contract awarded for design and construction of 10 electrostatic precipitators. Tentative installation scheduled during outages occurring between August 1968 and December 1969.
	Gallatin Steamplant, Gallatin, Tenn.	Contract awarded for design and construction of electrostatic precipitators. Installation scheduled during March-November 1969.
	Power Building, Chattanooga, Tenn.	Coal-fired boiler has been replaced with electric heating equipment.
Veterans' Administration	VA Hospital, Grand Junction, Colo.	Construction to convert boilers to gas-fired units underway.
	VA Hospital, West Haven, Conn.	Do.
	VA Center, Dublin, Ga.	Construction for conversion of boilers from coal to gas underway.
	VA Center, Des Moines, Iowa	Boiler modernization project completed. New boilers are gas-fired.
	VA Hospital, Knoxville, Iowa	Construction for conversion of boilers from coal to gas underway.
	VA Hospital, Louisville, Ky.	Do.
	VA Hospital, Castle Point, N.Y.	Discontinued incineration, disposing of waste by contract collection.
	VA Hospital, Montrose, N.Y.	Construction for conversion of boilers to gas-fired units underway.
	VA Hospital, Durham, N.C.	Design for conversion of boiler from coal to gas completed.
	VA Hospital, Fayetteville, N.C.	Construction for conversion of boilers from coal to gas underway.
	VA Hospital, Fargo, N. Dak.	Do.
	VA Hospital, Chillicothe, Ohio	Preliminary plans for replacement of boiler system completed. Discontinuance of open burning and installation of sanitary landfill completed.
	VA Hospital, Roseburg, Oreg.	Project for boiler replacement completed. New boilers are gas fired.
	VA Domiciliary, White City, Oreg.	Boiler replacement completed. New boilers are gas fired.
	VA Hospital, Aspinwall, Pa.	Replacement of coal-fired boilers with gas-fired boilers completed.
	VA Hospital, Erie, Pa.	Construction for conversion of boiler to gas-fired units underway.
	VA Hospital, Columbia, S.C.	Boiler replacement construction underway. New boilers to be gas fired.
	VA Hospital, Staunton Home, Texas	Power plant replacement preliminary plans underway.
	VA Hospital, American Lake, Wash.	Open burning discontinued. Sanitary landfill has been completed.
	VA Hospital, Spokane, Wash.	Construction for conversion of boiler from No. 6 oil to gas underway.
	VA Hospital, Vancouver, Wash.	Project drawings for conversion of boiler from coal to gas have been completed.
	VA Hospital, Huntington, W. Va.	Boiler replacement projects completed. New boilers are gas fired.
	VA Hospital, Madison, Wis.	Design for conversion of boilers from coal to gas completed.
	VA Hospital, Tomah, Wis.	Construction to convert boiler to gas-fired units underway.
	VA Hospital, Perry Point, Md.	Construction has started on a new boiler plant.
	VA Hospital, West Roxbury, Mass.	Boiler replacement completed. New boilers are gas fired.
	VA Hospital, Ann Arbor, Mich.	Construction to convert boilers from coal to gas underway.
	VA Hospital, Battle Creek, Mich.	Construction for conversion of boiler to gas-fired units underway.
	VA Hospital, Dearborn, Mich.	Installation of new gas-fired boiler completed. Construction for replacing refuse incinerator underway.

See footnote at end of table, p. 28.

APPENDIX C—Continued

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installation	Actions
Veterans' Administration—Continued		
	VA Hospital, Iron Mountain, Mich	Construction for conversion of boilers to gas-fired units underway.
	VA Hospital, Jefferson Barracks, St. Louis, Mo	Do.
	VA Hospital, Kansas City, Mo	Do.
	VA Hospital, Lyons, N.J	Do.
	VA Hospital, Lexington, Ky	Do.

[1] List of installations:

Alabama:
- Boaz
- Jackson
- Guin
- Georgiana
- Moulton

Arkansas:
- Des Arc
- Osceola

Arizona:
- Apache Junction
- Sedona

California:
- Antioch
- Apple Valley
- Aptos
- Atascadero
- Benicia
- Broderick
- Capitola
- Castroville
- El Cajon
- Escalon
- Fairfield
- Felton
- Lathrop
- Livingston
- Napa
- New Castle
- Orangevale
- Orland
- Pinedale
- Soledad
- Solvang
- Sunnyvale
- West Sacramento

Hawaii: Honolulu

Iowa:
- Davenport
- Des Moines
  - Carrier annex
  - East 14th St.
  - South Des Moines station
  - Urbandale branch
  - University Pl. station
- Tama
- Waterloo
  - Evansdale branch
  - Washburn branch

Maryland: Beltsville

Minnesota:
- Canby
- Excelsior
- Mound
- Sauk Rapids
- Silver Bay

Missouri:
- Hayti
- Imperia
- O'Fallon
- Portageville
- East Prairie
- Salisbury
- Sarcoxie

North Dakota:
- Mandan
- Minot

Tennessee:
- Centerville
- Jamestown
- Mountain City
- Parsons

Wisconsin:
- Menomonee Falls
- New Berlin
- New Lisbon
- New Richmond
- Oak Creek
- East Troy
- Randolph

GRISWOLD DEPOSITION
EXHIBIT 5

69-139

OPERATING EXPERIENCE WITH WET-DOLOMITE SCRUBBING

by

J. F. McLAUGHLIN, Executive Assistant
Union Electric Company
St. Louis, Missouri

and

J. JONAKIN, Product Manager
Air Pollution Control Systems
Combustion Engineering, Inc.
Windsor, Connecticut

Presented at

AIR POLLUTION CONTROL ASSOCIATION
ANNUAL MEETING
New York, New York
June 22-26, 1969

OPERATING EXPERIENCE WITH WET-DOLOMITE SCRUBBING

In September 1967, Combustion Engineering, Inc. and Union Electric Co. announced plans to install a full-scale sulfur dioxide removal system on one of the units at Union Electric's Meramec plant in St. Louis County. The system was developed by Combustion Engineering and utilizes limestone or dolomite injection into the furnace and a wet scrubber for particulate and sulfur dioxide removal. Results of laboratory tests and field tests of a pilot system at the St. Clair plant of Detroit Edison Co. were reported at the American Power Conference in April, 1967.[1]

The system was designed and installed on the Meramec No. 2 unit during the period October 1967 to June 1968 (Fig. 1). Initial operation was deferred until September 1968 to avoid the summer high-load period. The system was operated initially on natural gas beginning September 9, 1968 and initially with coal on September 19. During the period September 1968 to May 1969, the system operated on coal for 31 days.

Operation of the system has revealed problems that were not evident during initial experience with the pilot plant at Detroit Edison. It is the purpose of this paper to describe this operating experience, the modifications that have been made to the system, and the plans and expectations for the future.

Description of System

A schematic of the sulfur dioxide removal system is shown in Fig. 2. Crushed limestone is delivered to the plant by truck and unloaded into a hopper normally used for rail coal unloading. The coal conveyer system is used to transport the limestone to

the No. 2 unit coal bunker. During this operation, coal cannot be transported to the plant. The No. 2 bunker has been partitioned to separate the limestone above the "A" pulverizer from the coal above the other three pulverizers.

The boiler-turbine unit has a maximum capability of 140 Mw. This capacity can be obtained with three pulverizers when the pulverizers are in top grinding condition. Some loss in unit capacity can be expected as the pulverizers wear, since the fourth pulverizer is used for limestone.

The "A" pulverizer and exhauster system pulverizes the limestone and injects it above the coal flame from the other burners. The "A" burners have been disconnected from the burner tilt mechanism and are fixed in a 15° upward position. The electrostatic precipitators have been blanked off with one half of the blanking plates at inlet and outlet welded in place and the other half being bolted. This is done so that the bolted plates can be removed during a short outage and the generating unit operated with flue gas going through the precipitator while modifications are made to the SO_2 removal system.

A closed loop, liquid heat exchanger system is provided to extract heat from the flue gas ahead of the scrubbers and to reheat the flue gas after the scrubbers. The system is designed to reheat the flue gases 50 F for plume appearance, primarily.

Two National Dust Collector Hydro-Filter scrubbers are installed to operate in parallel (Fig. 3). Power-operated inlet and outlet dampers are provided for control to maintain a minimum gas velocity through the marble bed and for isolation of each scrubber.

Flue gas enters the scrubber beneath the marble bed and flows through the bed and out the top of the scrubber. Water sprays are located beneath the marble bed and are directed upward. The high-pressure drop through the marble bed causes the water spray to be broken up into a turbulent layer of water mist which traps the particulate matter. Water and collected particles overflow into drains which discharge below the bed. A gravity drain line from each scrubber discharges water and collected particles to the clarifier.

Solids are concentrated in the clarifier and pumped to a disposal pond. Most of the water is clarified and recycled to the scrubber.

The flue gases pass from the marble bed through a demister and the reheater and then to the induced-draft fan.

Expected Performance

Based on the pilot plant experience, Combustion Engineering has guaranteed that the air pollution control system (APCS) would perform as follows:

1. The sulfur oxides leaving the APCS are equivalent to burning a fuel containing 0.5% sulfur when sulfur in the fuel is no greater than 3.4%.

2. The particulate matter removal from the flue gas entering the APCS will be 99%.

Operating Experience

I. D. Fan Inlet

The reheater is a finned tube heat exchanger with close spaced tubes and fins. Cleaning of the heat exchanger was intended to be done by a water wash system using the scrubber spray

water. The wash system consisted of sprays located above and below the reheater. Originally it was planned that washing would be done at half load with the scrubber inlet and outlet dampers closed. The final design was worked out with on-line washing planned.

After approximately 12 hours of operation on coal, the wash system was operated to determine whether it would function properly. Some of the wash water carried over to the I.D. fans. It was observed to be leaking out of access doors in the fan inlet boxes. After a few hours, I.D. fan vibration increased. Inspection showed a heavy buildup of deposits on the fan blades with a thickness as great as 1 in. in spots. Sand blasting was required to remove the deposits.

It was apparent from this experience that moisture must be kept out of the fans. Drains were installed initially on the fan inlet boxes. These were later changed to an eductor system. Also, top reheater sprays would not be used when the scrubber was on line and botton sprays would be used carefully.

No further problems were experienced with fan blade deposits. Normally there is no moisture carryover from the reheater. Moisture has been observed coming from the inlet box drains during start-up and during single-fan operation.

Overflow Drains

Another early problem was the deposit of calcium sulfate on the overflow drain screens (Fig. 4a). These deposits formed in a short period of time (less than 24 hours) in sufficient amount to restrict the water flow and cause a high water level

in the scrubber. The screens were redesigned to increase the the size of openings and were painted with a polyurethane coating which has been found to reduce deposits (Fig. 4b). From the data obtained since making the above change, this problem seems to be solved.

Marble Bed Plugging

When operation of the system for periods longer than a few days was undertaken, the problem of plugging of the marble bed was observed. The bed would become inactive at the gas inlet end of the scrubber and this would progress until, on one occasion, more than 50% of bed area became plugged. High velocity in the active portion of the bed would cause carryover of water and solids resulting in deposits on the demister and the reheater.

Model tests of the scrubber were made by Combustion Engineering first using a water table and later using a three-dimensional air-flow model. Poor gas distribution was found as illustrated in the photograph of the water table in Fig. 5a. A series of ladder vanes, demonstrated by model tests, corrected the gas distribution problem (Fig. 5d). These were installed and the scrubber system was operated for six days without bed plugging. It would appear that this problem has been corrected, although a longer period of operation is needed to be certain.

Reheater Plugging

As previously described, the marble bed plugging caused carryover of water and solids to the demister and reheater.

As a result, the reheaters of both scrubbers became severely plugged so that the APCS was inoperable. Efforts to remove deposits by sandblasting and high pressure water-jetting were only partially successful. Due to the very close spacing of the finned tubing, sandblasting and water-jetting could not penetrate deep enough to completely clean the heaters. During a six-day period of operation with the reheater partially cleaned and scrubber bed operating properly, continued buildup of deposits on the reheater was observed despite frequent off-line water washing. Inspection of deposits on the reheaters indicated that when the scrubber bed was operating properly, dry deposits formed on the reheaters. In addition, data showed that the reheater surface could be reduced. Because of these two observations, the reheater surface in one scrubber was reduced 40% and manually-operated air soot blowers were installed and tested for 30 hours. No plugging occurred.

As of this writing, the lower half of the reheaters in both scrubbers has been removed and retractable air soot blowers are being installed. The lower half of the reheater held the heavy deposits. It is thought that the soot blowers will maintain acceptable cleanliness of the reheaters with the marble bed operating properly.

Scrubber Inlet Deposits

Possibly, the most difficult problem of all has been the buildup of deposits at the scrubber inlet. Model tests showed part of the problem as being a boundary-layer separation (Fig. 5b) which could be corrected by installation of turning

vanes in the inlet duct. After the turning vanes were installed (Fig. 5c), the deposit problem continued. This deposit builds up to the point where the inlet dampers become inoperable. Various configurations of inlet duct extension into the scrubber have been tried with some significant improvement being experienced on the most recent test run. All scrubber inlets are now being modified. However, to insure control, a half-retract soot blower is being installed in each inlet to remove deposits which may still occur.

Sulfur Dioxide Removal

Guaranteed sulfur dioxide removal efficiency has been obtained for short periods. This has required a greater use of additive than expected (130% to 140% vs 110% of stoichiometry). Spray water entering and leaving the clarifier has a pH of 9 to 10 instead of the 6 to 7 expected. Tests of slurry leaving the clarifier show a significant amount of reactive additive. It appears that a substantial portion of the limestone additive is removed below the marble bed and drains directly to the clarifier where some of it goes into solution as calcium hydroxide and is used in the scrubber for sulfur dioxide removal and some is removed with the ash and precipitated sulfates and pumped to a slurry pond.

It is now planned to recycle a portion of the clarifier underflow in order to utilize the additive more efficiently.

Particulate Removal

Tests have not been performed to determine particulate removal efficiency. However, stack appearance approximates that of an adjacent unit which has a high-efficiency electrostatic

precipitaters. Dust loading tests are planned during the next operating period.

Clarifier System

The clarifier and slurry pumping system has operated successfully with only minor problems evidenced at this time. Plugging of the pump suction has occurred a number of times due to restrictions caused by power-operated butterfly valves. These have been changed to plug valves to minimize the restriction. Solids concentrations of 20 to 30% by weight have been measured in the clarifier underflow. A short term concentration of 50% by weight was measured on one occasion.

Plume Heating System

Except for the reheater plugging previously described, the heat exchange system has operated satisfactorily. Flue gas temperature entering the reheater has typically been 120 F and has been 190 to 200 F leaving the reheater. As expected, a vapor plume exists when temperature and humidity conditions dictate. During moderate weather, a vapor plume frequently exists during night and early morning hours and disappears as ambient temperatures increase and reappears in the evening.

While plume appearance is still important and of concern, the experience with I.D. fan blade deposits suggests a compelling reason for plume reheating that was not apparent before. It is doubtful that fan blade deposits can be avoided if reheating is not provided.

Boiler Operation

Minor modifications were made to the limestone pulverizer

to minimize rejects which were quite high in early operation. A new feeder drive was installed to give better control in the 1 to 3 rpm range needed for this system.

No problems have been experienced with the furnace and convection pass of the boiler, with one exception. Buildup of deposits were found in the vicinity of steam aspirated O_2 probes which were backwashed with water. These will probably be changed to air cleaning probes. Fall out of solids increased in the air heater hopper requiring more frequent emptying of the hopper. This was particularly troublesome at half load when one scrubber was operated and gas velocities leaving the air heater were low. Some modification to the air heater hopper and to the removal system will probably be required.

Future Plans

As of this writing, plans are to start up the APCS about June 1, 1969. Work on modifications is going ahead, but construction trade labor disputes may delay the completion of this work. If delays are encountered, it may be necessary to postpone the operation of the system until fall to avoid possible forced outages of the unit during peak load periods.

It is expected that a portion of the clarifier underflow will be recycled to determine if additive loss can be reduced. A long operating period is needed to determine reliability of the system and to establish operating and maintenance costs.

Summary

Operation of the APCS has revealed problems that were not evident in the small pilot plant which was operated at one of

Detroit Edison's plants. This in itself is not surprising, since the extrapolation from a small pilot plant to a full-scale unit of the Meramec size must be done with considerable risk. Combustion Engineering and Union Electric recognized that this would be a development project and that inevitable problems would occur which would require design changes. To be candid, we should say that trouble occurred where we did not expect trouble and did not occur, as yet, where we expected it.

In the seven and one-half months since the system was first started, there have been 31 days that the system has operated on coal. A number of modifications have been made. Most of the major problems appear to have been corrected, but more operating time is needed to confirm this. The system is now out of service for further modifications and we expect to start up again in June.

The system has demonstrated that it will remove the amount of sulfur dioxide expected although complete and formal acceptance tests have not been performed. Particulate removal has not been determined. Although the system cannot be considered commercially acceptable at this time, a great deal has been learned from this development project and both Combustion Engineering and Union Electric are optimistic about the ultimate workability of the system.

An extended period of operation is planned in order to establish the reliability of the system and to determine operating and maintenance costs. After having obtained this information, we will be able to determine the applicability of the system for both existing and new large units.

Reference

1. Plumley, A. L., Whidden, O. D., Shutko, F. W., and Jonakin J., "Removal of SO_2 and Dust from Stack Gases" PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, Volume XXIX, 1967

Bibliography

1. McLaughlin, J. F. and Jonakin, J., "SO_2 Trapped In Full Scale System, "ELECTRICAL WORLD, November 13, 1967

2. Jonakin, J. and McLaughlin, J. F., "Operating Experience with the First Full Scale System for Removal of SO_2 and Dust from Stack Gases", American Power Conference, April 1969

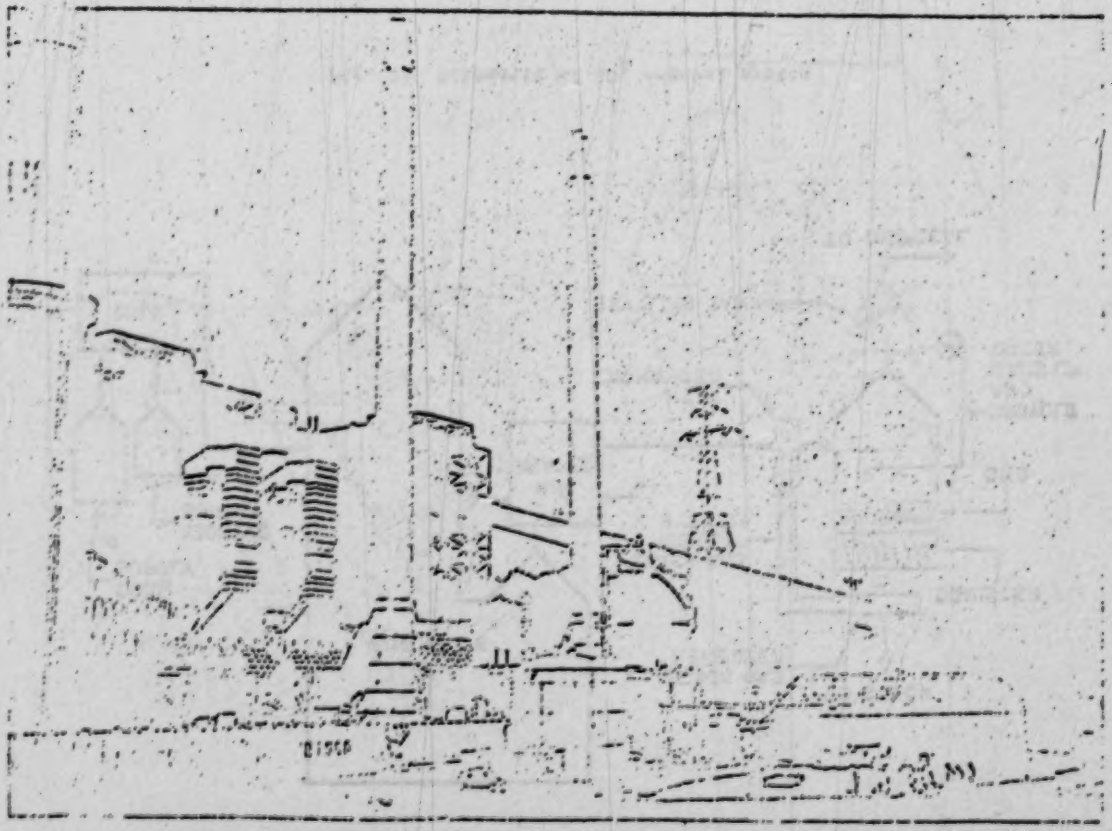


Fig. 1: Air pollution control system installed at Meramec Station of Union Electric Co.

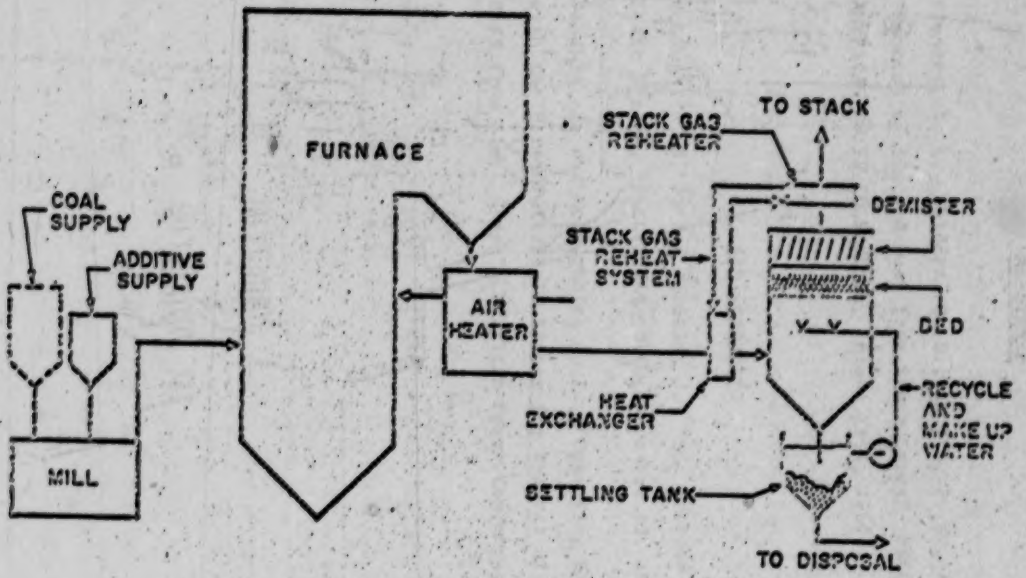


Fig. 2: Schematic of SO_2 removal system

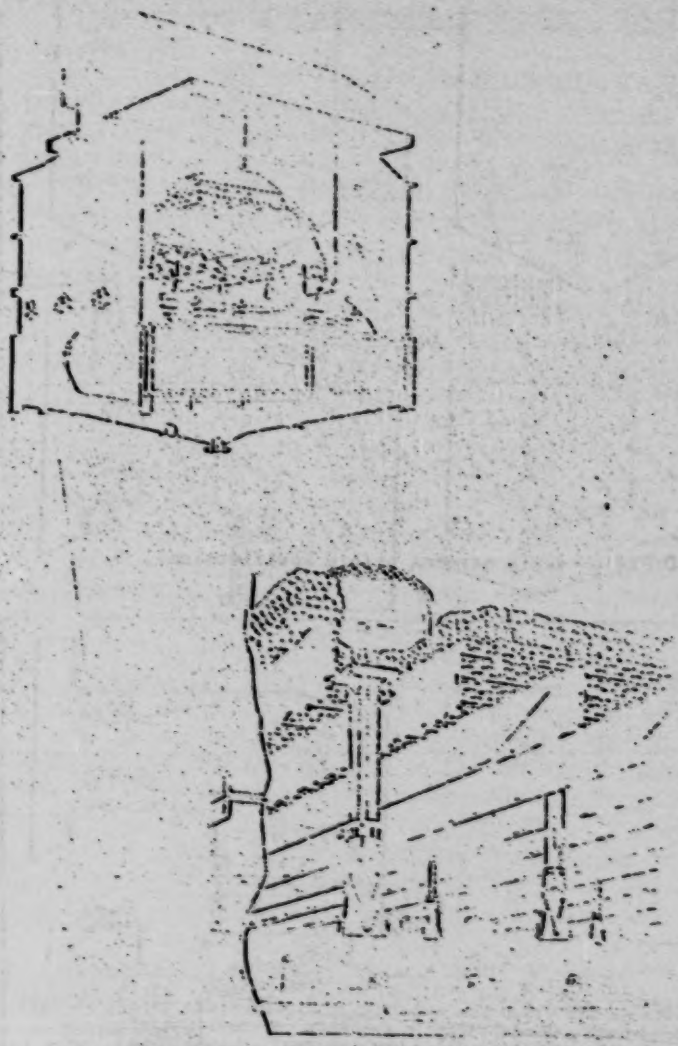


Fig. 3: Wet scrubber

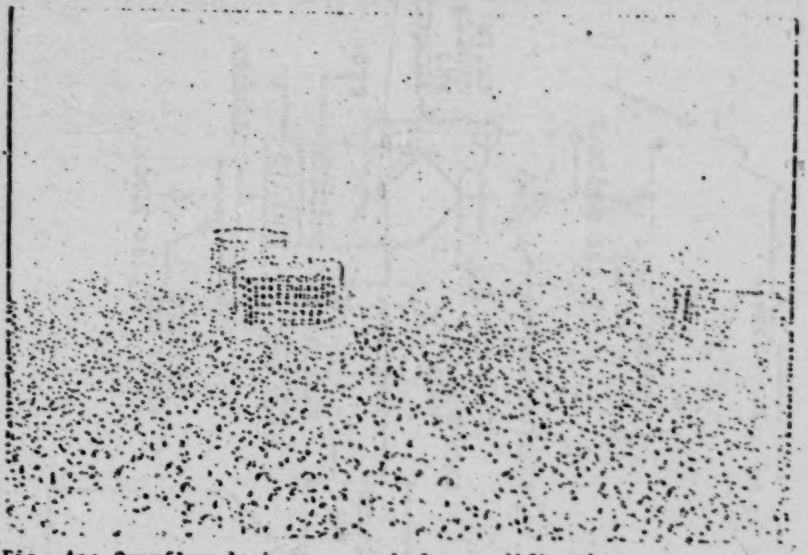


Fig. 4a: Overflow drain screens before modification

Fig. 4b: Overflow drain screens after modification

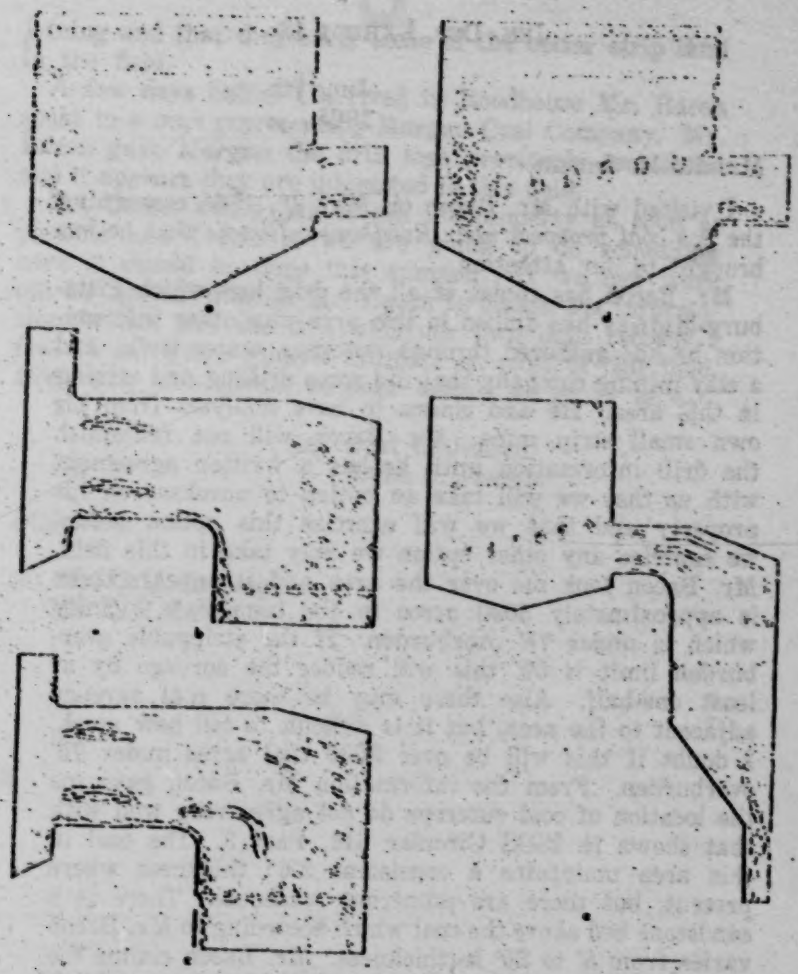


Fig. 5: Water table models of scrubber and duct work — a. showing poor distribution; b. close-up of inlet showing dead boundary layer condition; c. turning vane which eliminates boundary layer condition; d. ladder vanes which eliminate poor distribution under bed; and e. overall view with modifications installed.

JEN. DEP. EXHIBIT 12

June 7th
1965

Mr. R. H. Inman

I visited with Mr. Bacon on May 28, 1965 concerning the *#2 coal prospect near Roodhouse, Illinois* that he has brought to our attention.

Mr. Bacon has copies of all the drill logs which Pittsburg-Midway has drilled in this area plus other information he has gathered through outcrops, water wells, and a clay mining company that did some drilling and mining in this area. He also claims to have analyses from his own small strip mine. Mr. Bacon will not relinquish the drill information until he has a written agreement with us that we will take an option to purchase on his property and that we will exercise this option before we exercise any other option we may take in this field. Mr. Bacon took me over the area and it appears there is approximately 5000 acres in the immediate vicinity which is under 75′ overburden. If the strippable overburden limit is 50′ this will reduce the acreage by at least one-half. Also there may be more coal acreage adjacent to the area, but it is difficult to tell how much. I doubt if this will be over 3000 coal acres under 75′ overburden. From the information Mr. Bacon gave me the location of coal outcrops do not agree very well with that shown in ISGS Circular 311, Part 3. The coal in this area maintains a consistent 2′6″ thickness where present, but there are numerous washouts. There is a sandstone bed above the coal which according to Mr. Bacon varies from 5′ to 20′ in thickness. Mr. Bacon claims the sandstone is hardest near the outcrop, but becomes soft and friable under deeper overburden. Also in this area there is a lens of coal which is locally as much as 8′ thick and called the Roodhouse coal. Its areal extent is not known.

Ayrshire has exercised three options within this area. I don't have these plotted, but I know they are not ad-

joining and that they cover some of the better strip land in the field.

A few days before I arrived in Roodhouse Mr. Bacon spoke to a man representing Morgan Coal Company. Mr. Bacon gave Morgan the drill logs previously mentioned and it appears they are interested in this field.

Mr. Bacon would like to sell his property as soon as possible and I feel if we are going to do something here it should be done this summer. If we can work out an agreement with Mr. Bacon to obtain the information he has and use this with our own drill records I feel we can get a reliable estimate on most of this field. Preferably this should be done before we go in here.

/s/ Burl C. Jensen
BURL C. JENSEN

BCJ/ah

cc: Mr. D. H. Emling
Mr. T. H. Latimer

JEN. DEP. EXHIBIT 13

June 7th
1966

Mr. R. H. Inman

ROODHOUSE FIELD

In the main body of this field there is an estimated potential of about 10,000,000 tons with an average overburden of 50′, using a 70′ maximum overburden as cut-off for the estimate. As the coal averages 2′6″ thick, this would give a maximum ratio of 32 and an average ratio of 23. Most of the property we have optioned in this area is not within this 10,000,000 ton area, therefore, we have only a limited amount of drilling to estimate from. We do not know the extent of the faults in the area and those could affect the tonnage estimates either way with the possibility of decreasing the estimate. As you know, Ayrshire has retained land in this field. Within the estimated 10,000,000 ton area they have a total of 635 acres with about 350 coal acres containing approximately 1,220,000 tons of strip coal.

There is another potential area less than 1 mile to the west across Wolf Run Creek which may contain 5,000,000 tons of strip coal with less than 70′ overburden. The drilling here is scattered and the area still needs to be proven. We do have a few options in this area which indicate the presence of a possible 5,000,000 tons.

We also have an isolated option on the Stechol property about 6 miles east and 2 miles north of the main Roodhouse Field. This area is in the bottom land of Apple Creek, but does offer the possibility of picking up additional strip coal if the bottom land is minable. The Stechol 260 acre option contained 189 acres of coal or 659,000 tons with an average ratio of 28.

The general terrain of the Roodhouse area is filled with gullies and could contain several million tons under 70′ of overburden, but would be narrow strips of contour

mining. No estimate was made of these areas, although much of the options that we had taken lie in this type of terrain.

In 1948 we drilled in an area about 5 miles to the south. The area is near the town of Wrights and offers the possibility of adding additional tonnage to the field. There is approximately 480 acres of drilled coal reserves with less than 70′ of overburden in this area. The average coal thickness is 2′6″ with a ratio of 23, giving a total drilled coal reserve of 1,670,000 tons with the possibility of gaining additional reserves on adjacent properties. This reserve is bisected by the C. B. & Q. Railroad which would require mining two separate areas.

The C. M. & O. Railroad lies about 3 miles west of the western edge of the 10,000,000 ton Roodhouse area. The C. M. & O. intersects with the C. B. & Q. about 3 miles south at Whitehall, Illinois. The Illinois River is approximately 15 miles in a straight line west of this field.

If the potential of this field is satisfactory and we intend to prospect the area further it is recommended that we keep all or a part of only 8 of the 17 options, and pick up more options in the areas offering the greatest strip potential which we are now better suited to choose.

Below is a summary of each of the tracts we have options on in the Roodhouse Field. The drilling in this field was done by John Hoskins Company.

1—Wagner, 160 acres. The minimum overburden is 60′ and the ratio is 40 cu. yds. The cost per ton would be 10¢ on 561,000 tons estimated. Earned royalty is 15¢ per ton. Recommend that this be dropped because of the high overburden.

2—L. Gilmore, 65 acres. This would be cropline mining in hollows only. Recommend we drop this.

3—K. Henneberg, 120 acres. This tract is in the estimated 5,000,000 ton area as mentioned above and should be kept. There is 100 acres of coal and 337,000 tons. The overburden is from crop to a maximum of 71′ with an average ratio of 26 and a cost per ton of 12.5¢ or an earned royalty of 15¢ per ton.

4—W. VanSicson, 195 acres. There is 170 acres of coal. The overburden is outcrop to 90′ with an average ratio of 32. The cost per ton would be 11.5¢. The lower overburden in this estimate is crop-line mining, therefore I recommend it be dropped.

5—M. Tillery, 160 acres. This is in the 10,000,000 ton area and I recommend that we keep only 40 acres. This is an isolated 40 acres from the other 120 acres in the option and contains all the coal. Cost per ton on 160 acres is 39¢, but the cost per ton on the 40 acres would be approximately 10¢ or 15¢ earned royalty. Average ratio is 20 and the overburden is 35′ to 52′. Estimated 144,000 tons.

6—P. Bell, 260 acres. Recommend that it be dropped. There are 225 acres of coal or 758,000 tons. Overburden is 40′ to 80′ with an average ratio of 31. Mostly cropline mining, but some of it is in the 5,000,000 ton area. Cost per ton is 12¢. Earned royalty is 15¢.

7—W. Gilmore, 618 acres. Recommend that this be dropped. 160 acres of coal or 557,600 tons under 70′ of overburden, but would be cropline mining. Cost per ton would be 39¢.

8—E. Spencer, 417 acres. This is divided up into several separate tracts. Recommend that it be dropped. Practically all would be cropline mining and hollows or mining of deep overburden over 70′.

9—H. Strammat, 120 acres. Recommend that it be dropped. Only 30 acres of coal or 105,000 tons. Would be cropline mining and cost per ton would be 40¢ and the average ratio is 23.

10—A. Ontousn, 80 acres. This tract is in the 5,000,000 ton area. Recommend that we keep it. There is 75 acres of coal or 253,000 tons. Cost per ton would be 11.1¢ or 15¢ earned royalty. Average ratio is 26. Overburden ranges from 30′ to 70′.

11—J. Sheppard, 172 acres. Recommend that we keep 80 acres which is in the 10,000,000 ton area. This 80 is separate from the other 92 acres in the option. There are 26 acres of coal or 91,000 tons. The cost

per ton would be 66¢ on the 172 acres, but 30.8¢ on the 80 acres. Average ratio is 15 and the overburden is from outcrop to 45′.

12—M. Townsend, 42 acres. Recommend we drop this as it will be all cropline mining.

13—L. H. Hubbard, 160 acres. This option is divided into two separate tracts. I recommend that we drop the 90 acre tract which contains only 10 acres of coal or 34,850 tons. Cost would be 90¢ per ton, however, if we plan further prospecting in this area we recommend we keep the 70 acre tract since it is lying in the 5,000,000 ton area. There is not enough drilling on this to provide an estimate at this time.

14—W. L. Allen, 40 acres. Recommend that we keep this. Contains 30 acres of coal and is located in the 10,000,000 ton area. It is estimated to be 105,000 tons with an overburden range from cropline to 44′ and the average ratio is 16. The cost per ton would be 13.3¢ or 15¢ earned royalty.

15—R. A. Smith, 202 acres. Recommend that this be dropped. 179 acres of coal would be cropline mining and the plus 70′ of overburden, however, there is 582,000 tons with an average ratio of 23. Cost per ton would be 12.2¢ or 15¢ earned royalty.

16—S. Steckel, 260 acres. Recommend that we keep this tract. It is the isolated tract in the Apple Creek bottom and contains 189 acres in less than 70′ of overburden. The estimated tons is 659,000 with an average ratio of 25. Cost per ton would be 13.8¢ or 15¢ earned royalty.

17—R. Pollack, 240 acres. Recommend that this be kept. There are 147 acres of coal or 512,000 tons. It is located in the 10,000,000 ton area. The average ratio would be 20. Overburden ranges from outcrop to 56′. The cost per ton would be 16.4¢ or 15¢ earned royalty.

It should be kept in mind however that if we do keep any of these tracts, we, under previous agreement are obligated to take the Bacon option. On the Bacon tract we had estimated 181,000 tons. The cost per ton here

would be 19¢, but if you include the Model 702 Kochring dragline, the cost per ton would be 23¢.

It should also be noted that on the list of options that should come up before the Board meeting, those listed beginning with Albert Bateman in Green County expire in September rather than August as stated on the list. If there was another Board meeting in August we still would have approximately 90 days to decide on these 8 tracts. These represent 6 of the 8 tracts that we would consider keeping if we intend to prospect this field further. The other 2 that we recommend to keep—Hanneberg is in the 5,000,000 ton area and the Kenneth Tillery which we suggest we keep only 40 acres possibly could be dropped and if anything developed we could pick these up at a future date. In the meantime this would give us approximately 90 days before the others were expired to pick up additional tracts where we feel the greatest potential lies and give us a better chance to rule on the Roodhouse Field. I had only noticed that these dates were wrong since we last talked about the Roodhouse Field.

Attached are 2 copies each of the analyses of 4 cores taken at the Roodhouse Field. Also attached is an average of these 4 analyses along with the comparison study of the No. 2 coal in other areas of Illinois.

We now have on file, Corps of Engineer maps and 15′ quadrangles of the area.

DHE & BCJ/ah

D. H. EMLING

B. C. JENSEN

Kolbe Deposition Exhibit 2

* * *

P-2003303

For thirty-eight years your Company has been engaged in a single business—mining bituminous coal by the strip or open pit method and marketing that coal in the Midwest.

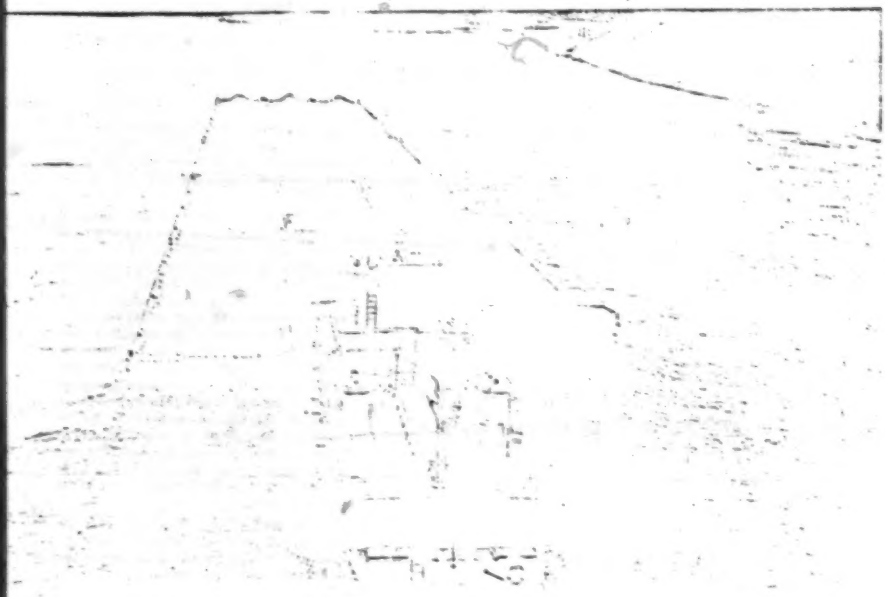
The coal seam in a strip mine must lie closer to the surface than in an underground mine. In our method of mining, the coal is uncovered by removing the dirt, rock, and shale with large earth moving machines. These machines represent a larger investment in equipment than would be necessary for a comparable operation in underground mining. Strip mining, however, has resulted in a higher output per man-day which, in the face of constantly increasing labor costs, has placed these mines in an excellent position competitively in the industry. The increase by your Company in tons produced per man-day has been two and one-half times the gain by all bituminous mines in the United States in the last ten years.

The progress of your Company over the past several years may be more clearly understood by noting some of its specific developments and improvements.

The use of this excavator in a pit with a shovel makes possible the recovery of coal with overburdens up to 100 feet. Three or four times as much material is moved in a month with "wheels" as was moved with the draglines they replaced. The use of a "wheel" with a shovel permits the shovel to operate at its greatest efficiency. Drilling and blasting from the ledge created by a "wheel" on the digging side of the pit reduces those costs because the material moved to form the ledge does not have to be drilled or blasted. The much wider pits made possible with the use of wheel excavators has improved the operating performance of the entire pit including the coal loading shovels and truck haulage units. The "wheel" and a shovel working together can economically strip coal which could not have been mined before at a profit.

HAULING COAL In order to reduce the cost of transporting coal from the pit to the preparation plant, we are using larger truck haulage units than formerly. We have recently acquired our first fifty-ton trucks which will haul about 50% more than the units they replaced.

PREPARATION OF COAL FOR MARKET Modern industrialization makes great demands on the washing, sizing, and quality preparation of coals. All of our mines are equipped with preparation plants designed to meet these demands. Our two most recently constructed plants are of the new "heavy media" design. These "heavy media" plants provide a finer,



DRILLING At some mines rock present in the ground overlying the coal adds a problem to the removal of the overburden—the material above the coal. The rock must be drilled and blasted before it can be moved.

We have met this problem by designing and developing a new rotary type drill. This drill, using compressed air rather than water to bring up the drill cuttings, is completely self-propelled and has a single drill stem long enough to permit the drilling of a complete hole. The footage drilled per man-hour has doubled in the last three years with the use of this drill.

BLASTING ROCK When the drilling is completed, the holes are filled with explosives which, when detonated, break the rock material to a size that can be moved. During the period of a year we use several million pounds of explosive for this purpose.

The cost of this operation was substantially reduced when we inaugurated the use of a new explosive a year ago. After years of research we discovered this compound, called Unimite, which had the qualities of strength, compactness, and safety so valuable for our needs. We are making this explosive from its basic ingredients on our mine property. Unimite not only gives us a cost savings per pound but permits drilling fewer holes—over 50% greater recovery per hole drilled.

STRIPPING Stripping is essentially a tremendous earth moving process and is performed by developing a long ditch or pit down to the coal, moving the material off the coal along one side of the pit and depositing it on the other side. By continuing this operation, always working in the same general direction, the open pit is gradually moved along exposing the coal which can then be removed. In stripping overburden, which is usually the most costly operation at a strip mine, your Company has made particularly important progress.

The conventional machinery used for this work has been a shovel or a dragline in pits of about 50 feet or less. In pits higher than 50 or 60 feet a dragline may be able to operate alone but usually a shovel and a dragline are necessary. These shovels are highly efficient machines but experience has shown that draglines usually result in high cost operations. As low overburden stripping reserves become increasingly difficult to find, this cost problem has become more important.

Your Company's answer to higher overburdens and a faster and cheaper method of moving dirt is the Kolbe wheel excavator and our three principal mines are equipped with these machines. The wheel excavator was conceived by your Company's president, Mr. Frank F. Kolbe, and developed by him and our engineers.

Although the machine itself is very complicated, the principle of the wheel excavator is easily understood. Material is taken off one side of the pit by a revolving wheel and moved across the pit continuously by a belt conveyor system.

more uniform control over preparation than other types and thus produce a better product. This is accomplished with less waste refuse and consequently at cost savings.

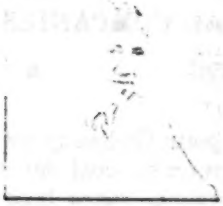
WATER TRANSPORTATION Transportation to the consumer is a major part of the delivered price of coal. Water movement of commodities, when practical, is considerably less expensive than other means of transportation. United Electric recognized the importance of low cost transportation of our coal and consequently were pioneers in the development of water facilities for coal in our area.

All of our principal mines are located along the Illinois or Mississippi rivers. About 50% of the coal from these mines is moved by water. We have recently invested in a barge line to further expand the markets for our coal through water transportation. We are also developing the first all-water movement of coal from Illinois mines to ports on both banks of Lake Michigan which will provide an additional outlet for our coal during the summer months. This is being accomplished by means of a barge to boat transfer operation.

These developments and improvements have been pursued to strengthen our position in the coal industry and in the overall industry of energy and fuel.

* * *

Kolbe Deposition Exhibit 4
The United Electric Coal Companies - 1958 Annual Report



To the Stockholders of The United Electric Coal Companies

THE PRESIDENT'S LETTER

During the past year American business and industry felt the impact of a general slackening in economic activity. United Electric's production in this period was off 7 per cent.

National production of coal during our fiscal year was about 420 million tons – 80 million tons less than during the previous year. The steel industry and export markets took 50 million tons less than in 1957 and this represents 63 per cent of the total decrease for the year. We serve neither of these two markets, however, and consequently that reduced demand resulted in no loss of business to your Company. Our decrease in output was limited to the effects of lower industrial production and resulting reduced power requirements by industry. Power requirements for residential use increased.

The expanding electric utility industry makes the outlook for coal very encouraging. Utilities are now the leading consumer of bituminous coal and prospects are bright for a continued strong growth in coal requirements for the generation of electric power. Utilities have about doubled their consumption of coal from 1949 to 1957. The Federal Power Commission has recently predicted that energy requirements for all utilities in the United States will double from the present time to 1970 and almost triple by 1980. The gain forecast for our area is slightly more than this.

KOLBE DEPOSITION EXHIBIT 7

THE UNITED ELECTRIC COAL COMPANIES

1961 Annual Report

* * * *

COAL DEPOSITS/At the year end your Company owned or controlled 122 million tons of recoverable coal deposits. This tonnage is greater than in previous years because, for the first time, we are including underground coal. The total amount that can be mined by the strip method is 86 million tons and 36 million tons are suitable for underground mining. We have confidence in the future of coal and we continue to add to our holdings when worth-while deposits are offered to us.

* * * *

This growth is important to the coal industry and is particularly significant for our Company. Last year one half of our total output was sold to utilities. Numerous large utility plants are under construction, or are being planned, in our area and we will benefit from that expansion.

It has been our objective to develop electric utility business to take advantage of the inherent stability and growth in that industry. This type of business enables us to invest in capital expansion with a minimum risk of excess productive capacity. In supplying this expanding demand for our product we avoid the serious price fluctuations which occur in widely varying and cyclical markets.

While oil for utility and industrial consumers is not a cause for concern in our market area, as our prices are below those for oil, "dump" gas does pose a serious problem for our Company. It is difficult to compete with the by-product price of this gas dumped on the market during the summer months. The Company subscribes to the view that it is a waste of a valuable natural resource by the gas industry to sell below cost to industrial consumers during the summer period and has favored legislation to prohibit such sales. We also feel it is inconsistent to have existing gas reserves dissipated in this manner when our Federal Government is encouraging with favorable tax laws the exploration for new reserves.

I take this occasion to express my sincere thanks to all the employes of United Electric for their continuing and loyal efforts which are always so important in determining the success of the Company.

Respectfully submitted,

Frank F. Kolbe

President

September 12, 1958

* * *

KOLBE DEPOSITION EXHIBIT 12

February 27, 1957

Mr. W. B. Hillery
Greenwood Cut Stone Co.
Box 54
Greenwood, Arkansas

Dear Mr. Hillery:

We have gone over the maps and drill records of the Central Coal and Coke property in Sebastian County, Arkansas. I think that since it is a completely different type of market from that in which we are now engaged, it is too far out of our line for us to become interested at the present time.

Thank you, though, for bringing it to our attention, as it apparently has considerable merit.

It was nice to hear from you and to see that you are keeping yourself busy. We have been doing well, but at the moment the coal demand has been softening somewhat.

Very sincerely yours,
President

Copy to: Mr. R. J. Hepburn
Mr. T. H. Latimer

KOLBE DEPOSITION EXHIBIT 13

February 18th
1957

Mr. F. F. Kolbe:

I have gone over the maps and drill records of the Central Coal & Coke property in Sebastian County, Arkansas. This was submitted through W. B. Hillery.

This is but a few miles northeast of our Pine Mountain, Oklahoma field, and lies partly under Potoau Mountain, which you may remember seeing just east of Potoau, and partly under Sugarloaf Mountain. It is on the Rock Island Railroad, adjoining the town of Hartford, Arkansas.

This coal outcrops near the base of the mountain, apparently at an altitude of about 750 feet. There is apparently a small amount of stripping around the crop, but the coal dips under the mountain, and then flattens out. The drill records have no elevations on them, so I cannot determine the pitch, said to be 10%.

Analysis of the coal (Hartshorne seam) is given below.

Moisture	.81%
Volatile Matter	18.50
Fixed Carbon	74.48
Ash	6.31
Sulphur	.79
BTU	14,691

According to Central Coal and Coke, the thickness is about four foot, and the roof is good.

The drill records do not quite bear out the four foot thickness, and quite a number of check holes should be put down. These would run from 25 feet to perhaps 1300 feet in depth.

They own over 12,000 acres of mineral rights, and almost as much surface, and show over 85,000,000 tons in place.

This is an excellent grade of coal, and apparently is suitable for the type of coke the Western steel mills need badly, it is strictly an underground mining proposition, and I do not know how well it will lend itself to mechani-

KOLBE DEPOSITION EXHIBIT 14

THE UNITED ELECTRIC COAL COMPANIES
307 North Michigan Avenue
Chicago 1, Illinois

FRANK F. KOLBE
President

August 18, 1958

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Frank:

Herewith copies of the various letters that I received back in 1943 and 1944 relative to our dividend policy. I am also enclosing a transcript of our 1943 stockholders' meeting. Although this report is an extra copy, I would appreciate receiving it back.

Very sincerely yours,

/s/ Frank
President

Enclosures

zation. If we are interested, I feel we should have it examined by a competent consultant. There is an old mine on the property, and I understand the coal can still be examined at the face. The present operation is strictly scavanging.

/s/ T. H. L.
T. H. LATIMER

THL/ah

cc: Mr. R. J. Hepburn

KOLBE DEPOSITION EXHIBIT 15

August 20, 1958

Mr. Frank F. Kolbe, President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Dear Frank:

I am returning the letters which you received from your stockholders in 1943 and 1944, as well as a transcript of your 1943 stockholders meeting.

I gather that you have not had any letters of this nature since that time and I presume it's for the reason that you have been able to keep your stockholders happy in the intervening period.

I am grateful for the opportunity of reading this material.

Yours very truly,
FREEMAN COAL MINING CORPORATION

FRANK NUGENT
President

FN:mc

Enclosures

KOLBE DEPOSITION EXHIBIT 16

THE UNITED ELECTRIC COAL COMPANIES

307 North Michigan Avenue
Chicago 1, Illinois

FRANK F. KOLBE
President

January 22, 1959

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Frank:

Herewith a schedule of the amount earned by various coal companies in this section. It shows that we are not getting rich at present prices.

Very sincerely yours,

/s/ Frank
President

Enclosure

Percentage Earned on Assets—Various Coal Companies

Calendar Year 1957

	Net Profit After Taxes					Excluding Interest Expenses		
	Tons Produced	Per Ton Produced	Amount	Total Assets	Percentage Earned On Assets	Interest On Long Term Debt 1957	Estimated Net Profit	% Earned On Assets
Ayrshire Collieries Corporation	5,758,919	50.7¢	$ 2,919,505	$ 45,000,000 (1)	6.5%	$ 224,000	$ 3,064,583	6.8%
Old Ben Coal Corporation	3,519,264	40.4	1,420,581	30,102,000	4.7	—	1,420,581	4.7
Peabody Coal Company	25,073,453	57.6	8,672,816 (2)	124,517,000	6.5	2,153,897	10,158,655 (2)	7.6
United Electric Coal Companies	3,867,752	48.5	1,876,715	20,900,000	9.0	—	1,876,713	9.0
Total—above	36,219,388	41.1¢	$14,889,615	$220,519,000	6.5%		$16,520,580	7.3%
Truax-Traer Coal Company	7,768,854	57.6¢	$ 2,918,484 (3)	$ 45,000,000 (1)	6.5%	166,000	$ 3,041,224 (3)	7.1%
West Kentucky Coal Company	7,724,999	15.3	1,029,577	50,275,000	2.0	896,344	1,566,096	5.1
Ziegler Coal & Coke Co.			572,608	12,494,000	3.9	111,449	475,156	5.8
			$ 4,520,464	$105,767,000	4.1%		$ 5,082,546	4.8%
Total all above coal companies			$19,210,077	$326,026,000	5.7%		$21,603,076	6.4%
						Net Profit (Excl. Interest) Per Ton Produced		
First four companies listed as above	36,219,388	41.1¢	$14,889,615	$220,519,000	6.5%	45.6¢	$16,520,580	7.3%
First four companies earnings after taxes. 10¢ a ton more	36,219,598	51.1	18,611,552	220,519,000	8.0	55.6	20,142,469	8.7
First four companies earning after taxes. 20¢ a ton more	36,219,388	61.1	22,163,491	220,519,000	9.6			
First four companies earning after taxes. 10% on assets	36,219,388	68.6	23,031,900	220,519,000	10.0	68.6	23,031,900	10.0

(1) Assets estimated as of 12-31-57

(2) Income does not include special credit of $920,068—principally gain on sale of land

(3) Income for year ended 1-31-58

The 500 largest industrial corporations in the United States earned 9.2% on their assets in 1955, 6.2% in 1956 and 7.8% in 1957. About one-fourth of these 500 corporations earned 10% or more on their assets.

As indicated on the attached schedule Ayrshire Collieries, Old Ben, Peabody, and United Electric earned as a group 6.5% on assets in 1957. If sales realization had been about 15¢ a ton higher, which would have increased profit after taxes 10¢ a ton, those companies would have earned 9% on assets—about the average of the 500 largest corporations. If it is assumed that the four coal companies should earn 10% on assets, the before tax income would have to be increased by 35¢ to 40¢ a ton by either higher realization or lower costs.

Some of the coal companies have substantial interest charges on long term debt. In order to make all companies comparable this is eliminated in the last column and an appropriate adjustment is made in taxes. If it is assumed that the above four coal companies should earn before interest charges but after taxes an amount equal to 10% of assets, the 1957 income before taxes would have to be increased by about 25¢ a ton.

KOLBE DEPOSITION EXHIBIT 17

November 21st
1957

Mr. F. F. Kolbe

RE: Number 5 Coal in North Canton Field
(Specifically, an area 1½ miles north of Canton, west to Fiatt, north to Fairview, thence northeast to Farmington, south to 1½ miles north of Canton.)

Figures are based on information received from the Illinois State Geological Survey.

This area has been very sparsely drilled and there is a possibility of some faults in this area which are unknown in extent. However, with what information is available, it appears the coal dips 60 feet from Fairview to Brereton, a distance of 8 miles. There is a similar dip from the Truax-Traer property, which is approximately 6 miles.

Using this information, I feel there is possibly 10,000 acres of coal with less than 100 feet of overburden, or 50,000,000 tons of coal in this area northwest of Canton. In this same field, there should be another 50,000,000 tons of coal with 100 to 170 feet of cover. *The above acreage consists of the best farm land in Fulton County.*

It should be noted here, that in the area between Canton and Glasford, there is possibly 6,000 acres of coal with less than 100 feet of cover. This area has not been drilled either.

Attached is a small map showing the relative position of properties and overburden contours.

/s/ R. H. I.
R. H. INMAN

RHI/ah

cc: Mr. R. J. Hepburn
Mr. T. H. Latimer

KOLBE DEPOSITION EXHIBIT 33

May 10th
1961

Mr. R. J. Hepburn

INDUSTRY FIELD

We have examined our drill records at Industry and have compiled the average overburden.

The study was confined mainly to what is our present area and 80′ was the maximum overburden. I then went back over the field and made an estimate of the reserves under 65′ excluding all over 65′ except that which I feel is necessary to mine for accessibility.

The entire field has a reserve of 16,810,000 tons with an average ratio of 27.4.

Excluding that area with over 65′ of overburden not necessary to mine, the field reserves are 14,300,000 tons with a ratio of 26.2. This is an average overburden of 52.4′. Using averages only, the following is a typical drill hole.

	Percent	Feet
Surface	41.1	21.5
Gray Shale	25.5	13.4
Sandy Shale	25.6	13.4
Sand Rock	6.1	3.2
Sand	1.2	0.6
Mud	0.5	0.3

In looking over the drilling we have numerous holes which do not have any sandrock, but there are some with 3.0′ to 35′ of sandrock; where this does not appear we have sandy shale. I feel any future study should include core samples of this sandy shale.

I tentatively pick a spot of no coal area south and east of the center of the field for possible tipple location. This location would have an average haul of 1¾ miles.

Enclosed is a breakdown by sections of the coal reserves and the haul distance from above mentioned tipple location. Also enclosed are the drill logs per quarter section.

/s/ R. H. I.
R. H. INMAN

RHI/ah

INDUSTRY FIELD
Estimate Of Tons By Section

Section	Acres	Total Coal Acres	Acres Under 65′	Total Tons Under 80′	Controlled Tons	Total Tons Under 65′	Ratio Under 65′	Haulage Miles
22	640	271	271	852,176	556,168	852,176	21.3	2.5
23	640	50	50	168,440	168,440	168,440	21.4	2.0
24	640	119	119	378,557	231,400	378,557	21.2	2.0
19	640	282	282	870,384	30,000	870,384	26.3	2.9
20	640	80	80	255,000	0	255,000	27.9	3.2
29	640	270	0	862,400	0	0	0	—
30	640	421	322	1,418,264	850,320	1,084,733	23.5	2.2
25	640	630	630	2,104,920	2,074,920	2,104,920	27.1	1.6
26	640	474	474	1,560,038	1,560,038	1,560,038	26.3	1.6
27	640	101	101	316,736	316,736	316,736	20.5	2.3
28	640	60	60	192,000	192,000	192,000	22.9	2.5
32	640	90	90	288,000	0	288,000	26.3	3.3
33	640	482	442	1,520,610	760,305	1,394,410	26.3	2.6
34	640	425	267	1,370,600	628,875	861,050	23.7	1.5
35	640	445	445	1,466,046	1,196,546	1,466,046	29.1	0.7
36	640	340	340	1,086,419	811,530	1,086,419	25.0	0.7
2	640	278	183	854,640	854,640	562,610	24.3	0.7
3	640	530	73	470,400	0	228,928	31.3	1.3
4	640	240	203	773,280	282,240	654,066	25.8	2.7
				16,808,910	10,514,158	14,324,000	Ave. 26.2	Ave. 1.75

Kolbe Dep 42-1d

GOVERNMENT EXHIBIT
Kol. Dep.
42

1939

ANNUAL REPORT

The United Electric Coal Companies

CHICAGO

YEAR ENDED JULY 31st 1939

PRESIDENT'S REPORT

To the Stockholders of
THE UNITED ELECTRIC COAL COMPANIES:

The annual report of The United Electric Coal Companies is submitted herewith.

Notwithstanding the depressed business conditions during the year ended July 31, 1939, your Company produced 2,078,606 tons of coal, an increase of 13 per cent above the production of 1,838,656 tons for the preceding twelve months. Total production of bituminous coal in the United States during the same period was 358,798,000 tons, compared with 361,559,000 tons for the twelve months ended July 31, 1938, a decrease of 3/4 of 1 per cent. The production of 2,078,606 tons of coal during the last fiscal year was the largest production in the history of The United Electric Coal Companies, the best previous year being 1930 when production was 1,897,319 tons.

The net income for the year ended July 31, 1939 was $167,196.98, (before deducting write off on contracts acquired in 1929, now expired or abandoned, $146,240.57) as compared with $226,795.10 for the previous year. This decrease in net income is due to a reduction of 10 cents a ton in the selling price of our coal, partially offset by a reduction of 6 cents a ton in operating cost.

The average wage rate per hour paid to its mine labor by The United Electric Coal Companies in the year ended July 31, 1939, was 93.0 cents as against an average of 92.5 cents for the bituminous coal industry in the State of Illinois. This compares with 68.5 cents, the average wage of all industry in the State of Illinois, also with 92.6 cents for the average wage in the automobile industry and 64.6 cents for all manufacturing industries in the United States.

During the year, the Company operated four mines with the following production in tons:

Fidelity	992,026
Freeburg	244,614
Cuba	271,250
Buckheart	570,806

All mines are in excellent physical shape and are well equipped to take advantage of any increase in sales. The Buckheart Mine continues as one of the lowest cost producers in the United States, and it has the further advantage that its production is now moving to new markets through the completion last November of the 8-mile railroad to our loading terminal on the Illinois River.

The total reserves of coal owned or controlled by the Company are estimated at 65 million tons, divided among the different mines as follows:

Fidelity	24,288,983 tons
Freeburg	2,225,655 tons
Cuba	2,959,718 tons
Buckheart	11,079,896 tons
Other properties	24,766,017 tons

These reserves may be further increased through purchase or lease of additional areas adjacent to each of the above mines.

In October of last year, in accordance with plans previously submitted to stockholders, $2,100,000 was borrowed from banks. With the proceeds the old Creditors' Agreement notes were paid in full, all outstanding equipment notes were redeemed, and the balance was used in building the railroad to Liverpool, and to increase the Company's working capital. As of September 15, 1939, this debt had been reduced to $1,703,823.51.

The officers of the Company, together with the officers of other coal companies throughout the United States, have devoted considerable time and effort to the work of establishing minimum prices under the provisions of the Guffey Act. There is, however, nothing definite to be reported to the stockholders at this time.

Since the close of the last fiscal year, your Company has cooperated in the formation of two marketing agencies, one in the Fulton-Peoria District, where the Buckheart and Cuba mines are located, and the other in the Belleville District which includes the Fidelity and Freeburg mines. It is expected that these agencies, to which most of the strip mine operators in these areas belong, will do away with some of the unfavorable conditions that have existed in the past. These organizations are sanctioned by the Guffey Act.

Respectfully submitted,
FRANK F. KOLBE,
President.

September 16, 1939.

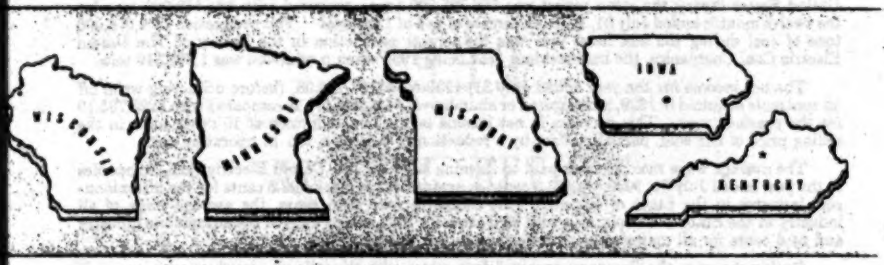
Kolbe Deposition Exhibit 51

The United Electric Coal Companies - 1948 Annual Report

* * *

* OFFICES: CHICAGO ST. LOUIS PEORIA DES MOINES

* MINES: FIDELITY MINE, DuQuoin, Illinois BUCKHEART MINE, Canton, Illinois CUBA MINE, Cuba, Illinois
RED RAY MINE, Freeburg, Illinois SOLAR MINE, Nashville, Illinois BUFFALO CREEK MINE, St. Charles, Ky.



A TEN YEAR RECORD OF GROWTH IN SERVICE

Even though you have an unusual interest in coal, it may never have occurred to you that, with the exception of food and water, coal is perhaps the most important and vital product known to man and is our greatest and most dependable source of useful energy.

Our economy is designed to function on power. In a handful of coal weighing less than a pound there is enough power to raise a weight of 33,000 pounds sixty feet. All the potential power of our reserves of oil and natural gas and of the water in our dams combined is only a

* * *

Kolbe Deposition Exhibit 57

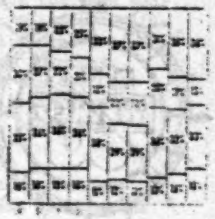
The United Electric Coal Companies - 1954 Annual Report

* * *

During the last two years we expended $3,094,165 for plant and equipment and $808,388 for lands. We have paid for these improvements with earnings and $735,278 of the proceeds of bank loans made in November, 1952. The remaining portion of these bank loans of $1,540,000 has been added to our working capital resulting in a net increase in working capital for the two years of $804,722.

PRODUCTION AND CONSUMPTION Last year was a period of considerable readjustment in the coal industry. Production for the country as a whole during our fiscal year was 404,000,000 tons, a decrease of 12% from the year before. The national production has been on the down trend for several years from its peak of 630,000,000 tons in 1947. In that year the railroad demand was 113,000,000 tons, and during our last fiscal year it was 21,000,000 tons. Residential consumption has also decreased from 99,000,000 to 59,000,000 tons in the same period. The decrease in railroad and residential business probably constitutes a permanent loss.

The bright feature in the coal industry has been the great increase in the coal used by the utilities. In 1940 this was 49,000,000 tons, and in our 1954 fiscal year it was 113,000,000. Thirty-six percent of our business is now with utilities and this percentage will increase.



Consumption of coal by various classes of customers during the past ten years

* * *

GOVERNMENT EXHIBIT Kol 59 Dep.

VALUATION
OF
PHYSICAL ASSETS
UNITED ELECTRIC COAL COMPANIES
AS OF
DECEMBER 31, 1959

PAUL WEIR COMPANY
MINING ENGINEERS
20 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

PAUL WEIR COMPANY
INCORPORATED
MINING ENGINEERS AND GEOLOGISTS
DESIGN AND CONSTRUCTION

PAUL WEIR, CHAIRMAN OF THE BOARD
CLAYTON S. BALL, PRESIDENT
JOHN E. GOOD, VICE PRESIDENT
JOHN P. WEIR, VICE PRESIDENT
DEWITT SAMMETER, VICE PRESIDENT
GEORGE D. GILLSON, VICE PRESIDENT
JOHN S. SEVERS, CHAIRMAN

FINANCIAL 6-0275
CHICAGO 4, ILLINOIS

July 25, 1960

United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Attention: Mr. J. H. Morris, President

Dear Sir:

You have requested us to give you an opinion of the value as of December 31, 1959 of the physical assets owned by your corporation. Accordingly, we have made the studies deemed by us to be necessary to give you such an opinion.

Insofar as possible, our findings are presented in Exhibits A to G, inclusive. The text of the report is at a minimum. Our findings are related to the book values of the physical assets as shown on your December 31, 1959 balance sheet. There are several considerations to which we direct your attention.

The principal factor we use in arriving at an opinion of the value of an individual active mine as an operating entity is the anticipated amount of cash generation that may be reasonably expected to accrue during the remaining life of the recoverable coal reserves available to the mine. Obviously, no value except that of salvage attaches to a mine operating at an out-of-pocket loss.

The estimation of the amount of cash generation for each year of remaining life of the mine involves the estimation of sales realizations, of total costs, and of the amount of federal income tax on profits, if any, calculated without any deductions for interest. Obviously, value is a factor independent of the means employed in financing. It also involves the estimation of additional investment necessary for replacement equipment and sometimes for additional equipment and/or additional coal reserves.

The estimation of future profits after federal income tax involves an analysis of past profits and the conditions under which profits accrued. Future profits must reflect anticipated changes in overburden ratios and other conditions that affect sales volume, total costs and sales realization.

The value of an operating mine when based on cash generation includes its proportional share of the value of all company-owned facilities at head and branch offices such as automobiles, furniture and fixtures that do not in themselves produce an operating profit. Excluded only are those items such as the recently acquired steel barges, farm buildings and equipment, Kingston River Terminal and inactive coal reserves. The profit-producing potential of the steel barges is unknown. Farm buildings and equipment are not profit-producing. Income from Kingston River Terminal is nominal.

The value that we assign to property, plant and equipment at an active mine represents that amount in dollars as of December 31, 1959 on which, out of the estimated net cash generation at the end of each year, there will be available an amount which is sufficient to provide a return of 10 percent on the amortized value at the end of each year and leave a remainder which, if applied to reduce the value, will extinguish it during the life of the mine.

We point out that when and if 10 to 12 percent of the sales realization from an individual mine is recovered as a profit after federal income tax without considering any deductions for interest, the operating results are invariably satisfactory. Above this zone of 10 to 12 percent, the operating results are very satisfactory. Below this zone of 10 to 12 percent, the mine is probably marginal.

We also point out that approximately 59 percent of the total values are represented by active mines. The value of inactive coal reserves alone represents approximately 8 percent of the total value.

Appended to this report are Exhibits A to G, inclusive. These present details of the compilation of our values. We make these specific comments:

Exhibit A - Buckheart

This includes the railroad and dock installation. The cash generation pattern is well established. The operation is exceedingly profitable.

Exhibit B- Cuba

The cash generation pattern has been changed to a minor extent by the installation of a Kolbe Wheel in mid 1959. For our purpose we have assumed that $1,000,000 remains in the capital account six years hence, also that the salvage value of equipment other than the wheel will be $300,000. This mine is a profitable operation.

Exhibit C - Fidelity

This operation has been and continues to be a marginal one. Our value of $3,463,939 is less than the book value of $3,698,821. While the earnings record does not support the book value, we believe that the property could be sold for the book value.

Exhibit D - Mary Moore

The coal reserves at this mine will be completely depleted during September 1960. Our value reflects cash generation for nine months plus a salvage value, the chief part of which is concentrated in the 7400 dragline.

Exhibit E - Banner

There is no earnings record on which to project values. We recognize that the inherent quality of the coal moves it into a higher price bracket than that of Fulton County coal. However, the coal seam is thin and stripping ratio is high. There are certain to be some unanticipated problems. We believe that our value, which represents a write-up of approximately $1,700,000, is a reasonable expectation.

Exhibit F

This is a summary of values assigned to the physical assets.

Exhibit G

This represents the Inactive Coal Reserves. Our opinion is that the present value of these coal reserves is that shown as the book value. Our procedure on active mines has been based on an after-tax return of 10 percent. It is unlikely that there will be any substantial amount of depletion of these reserves during the next decade. On a 10 percent compound basis, the investment in the reserves may be said to be $4,961,450 ten years hence. We do not believe the present book value is excessive. At the same time, we see no logical basis for any write-up in value.

The North Cantus and Industry Fields will have substantially higher stripping ratios. In time, competitive conditions will permit their profitable development.

Advance Royalties

The December 31, 1959 balance sheet shows the amount of advance royalties to be $687,554. Almost 90 percent of this is charged to Buckheart and Banner Mines. While this item is not a "physical asset" we do comment that we believe the asset is sound.

General

We have made exhaustive checks on estimates of recoverable coal reserves. We believe the estimates prepared by the Company are accurate. We have checked the anticipated future stripping ratios. Some increases are indicated but we do not believe that the increases will have more than a nominal effect on our projections and then only during the late years when the present worth factor is low.

We have made careful checks on plant and equipment. In our opinion, operating results represent a reasonable expectancy from the equipment in use.

Our value of $23,446,225 as of December 31, 1959 exceeds the book value of $16,902,703 of that same date by $6,543,522. The amount of $16,902,703 is the sum of $16,321,169 and $581,534, the amount actually paid on option contracts. If this excess were added to the shareholders' equity as of that date, the total would have been $26,669,388.

Respectfully submitted,

FWH

EXHIBIT A
VALUATION DATA
SUNSHEART MINE, EXCLUDING RAILROAD AND RIVER TERMINAL

	Fiscal Years ending July 31st					Average for 5 Years	Fiscal Year ending 7/31/59	Five Months ending December 31st		Projection for 17 Years	
	1954	1955	1956	1957	1958			1958	1959		
A. Production in Tons	900,360	1,077,608	1,142,775	1,206,885	1,097,508	1,085,027	1,250,479	562,680	583,072	22,067,152	1,298,067
B. Total Cost of Production, Sales & Administration:	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Amount	Per Ton
1. All costs other than	$2.7433	$2.8920	$3.0235	$2.8889	$3.1769	$2.9520	$3.0509	$2.8775	$3.0285	$67,304,814	$3.0500
2. Royalty	0.0070	-	-	-	0.0076	0.0027	0.0058	0.0037	0.0933	1,313,924(a)	0.0595
3. Depreciation	0.2684	0.2838	0.2921	0.2721	0.2880	0.2812	0.2857	0.2752	0.3232	5,031,516(c)	0.2280
4. Sustained Depletion	0.0609	0.0591	0.0633	0.1493	0.1520	0.0991	0.1567	0.1606	0.0581	2,220,410(b)	0.1106
Total	3.0796	3.2349	3.3789	3.3103	3.6245	3.3350	3.4991	3.3170	3.5032	75,870,764	3.4381
C. Net Sales Realization	3.9939	3.9539	4.0966	4.3413	4.4177	4.1706	4.4509	4.4238	4.5460	99,964,199	4.5300
B. Total Cost	3.0796	3.2349	3.3789	3.3103	3.6245	3.3350	3.4991	3.3170	3.5032	75,870,764	3.4381
D. Pre Tax Profit	0.9143	0.7190	0.7177	1.0310	0.7932	0.8356	0.9518	1.1068	1.0428	24,093,435	1.0919
E. Federal Income Tax	0.2917	0.1972	0.1983	0.3834	0.2572	0.2670	0.3408	0.4249	0.3370	8,459,937	0.3834
F. Net Profit after FIT	0.6206	0.5218	0.5194	0.6476	0.5360	0.5686	0.6111	0.6819	0.7058	15,633,498	0.7085
ADD:											
B-3 Depreciation	0.2684	0.2838	0.2921	0.2721	0.2880	0.2812	0.2857	0.2752	0.3232	5,031,516	0.2280
B-4 Sustained Depletion	0.0609	0.0591	0.0633	0.1493	0.1520	0.0991	0.1567	0.1606	0.0581	2,220,410	0.1006
G. Gross Cash Generation	$0.9499	$0.8647	$0.8748	$1.0690	$0.9760	$0.9489	$1.0532	$1.1177	$1.0871	$22,885,424	$1.0371
	($855,247)	($931,821)	($999,789)	($1,290,142)	($1,071,228)	($1,029,645)	($1,317,128)	($628,791)	($633,864)		
H. Book Values, in $:											
1. Coal Lands	$1,376,002	$3,041,285	$3,026,199	$2,935,897	$2,772,527	$2,630,382	$2,696,395		$2,220,410		
2. Plant & Equipment	2,579,660	2,459,460	2,360,432	2,617,702	2,917,514	2,586,954	2,921,011		2,758,233		
3. Work in Progress	-	-	-	-	#0	-	-		-		
Total	$3,955,662	$5,500,745	$5,386,631	$5,553,599	$5,690,041	$5,217,336	$5,617,406		$4,978,643		
I. Net Profit after FIT as Percent of:											
1. Net Sales Realization	15.54	13.20	12.68	14.94	12.13	13.63	13.73	15.41	14.48	15.64	
2. Total Book Value	14.13	10.22	11.02	14.07	10.34	11.82	13.60				
J. Gross Cash Generation as Percent of:											
1. Net Sales Realization	23.78	21.87	21.36	24.62	22.09	22.75	23.67	25.27	23.91	22.89	
2. Total Book Value	21.62	16.94	18.56	23.23	18.83	19.73	23.45				

FOOT NOTES:

Basis for Projection for 17 Years:

(a) Royalty: 6,569,618 tons @ $0.20 per ton $1,313,924
(c) Fee: 15,497,534 tons, Book Value- $2,220,410
(b) Necessary Reinvestment estimated at $0.12 per ton for 14 years $2,180,753
$2,180,753 plus $2,850,763 is total to be depreciated.
Assumed cost of Working Capital is 1.25 percent of Sales Realization.

Estimated Salvage Value 17 years hence $ 500,000

COMPUTATION OF VALUES PERIOD

	First 14 Years		Last 3 Years		Total, 17 Years	
Production in Tons	18,172,940		3,894,212		22,067,152	
Estimated Gross Cash Generation	$18,846,819	$1.0371	$4,038,605	$1.0371	$22,885,424	$1.0371
Less cost of working capital	1,029,042	0.0566	220.510	0.0566	1,249,552	0.0566
	17,817,777	0.9805	3,818,095	0.9805	21,635,872	0.9805
Less Reinvestment	2,180.753	0.1200	-	-	2,180.753	0.0988
Net Cash Generation	$15,637,024	$0.8605	$3,818,095	$0.9805	$19,455,119	$0.8817
Present Worth Factors P	0.52619		0.82895 0.26333			
Present Worth as of 12/31/1959 at 10 percent discount	$ 8,228,046		$ 833,442		$ 9,061,488	
Add present worth of Salvage Value					98,925	
Total Value as of December 31, 1959					$ 9,160,413	
Value per ton of Annual Production					$7.06	

EXHIBIT B
VALUATION DATA
CUBA MINE

	Fiscal Years ending July 31st					Average for 5 Years	Fiscal Year ending 7/31/59	Five Months ending December 31st		Projection for 6 Years	
	1954	1955	1956	1957	1958			1958	1959		
A. Production in Tons	838,086	761,613	800,558	766,466	794,367	792,218	847,492	324,439	380,595	4,502,153	(750,359)
B. Total Cost of Production, Sales & Administration:	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Amount	Per Ton
1. All costs other than	$2.7847	$3.0237	$2.6492	$3.0821	$3.0619	$2.9164	$3.0975	$3.0292	$3.0144	$13,551,481	$3.0100
2. Royalty	-	0.0029	0.0401	0.0454	0.0159	0.0206	0.0218	0.0216	0.0297	391(a)	-
3. Depreciation	0.1696	0.1864	0.1866	0.2224	0.2467	0.2020	0.2954	0.2292	0.3629	1,857,084(c)	0.4125
4. Sustained Depletion	0.0746	0.0747	0.0585	0.0564	0.0694	0.0660	0.0456	0.0481	0.0452	300,830(b)	0.0668
Total	3.0289	3.2877	2.9344	3.4063	3.3899	3.2050	3.4632	3.3281	3.4522	15,709,786	3.4893
C. Net Sales Realization	3.8573	3.7742	3.9645	4.2236	4.3190	4.0264	4.2974	4.2601	4.2451	19,314,236	4.2900
B. Total Cost	3.0289	3.2877	2.9344	3.4063	3.3899	3.2050	3.4632	3.3281	3.4522	15,709,786	3.4893
D. Pre Tax Profit	0.8284	0.4865	1.0301	0.8173	0.9291	0.8214	0.8342	0.9320	0.7929	3,604,450	0.8007
E. Federal Income Tax	0.2624	0.1387	0.3551	0.2299	0.2965	0.2560	0.2288	0.2826	0.2123	993,405	0.2207
F. Net Profit after FIT	0.5660	0.3478	0.6750	0.5874	0.6426	0.5654	0.6054	0.6494	0.5806	2,611,045	0.5800
ADD:											
B-3 Depreciation	0.1696	0.1864	0.1866	0.2224	0.2467	0.2020	0.2954	0.2292	0.3629	1,857,084	0.4125
B-4 Sustained Depletion	0.0746	0.0747	0.0585	0.0564	0.0694	0.0660	0.0456	0.0481	0.0452	300,830	0.0668
G. Gross Cash Generation	$0.8102	$0.6089	$0.9201	$0.8662	$0.9547	$0.8334	$0.9464	$0.9267	$0.9887	$4,768,959	$1.0593
	($678,980)	($463,821)	($736,579)	($663,938)	($758,428)	($660,349)	($802,017)				
H. Book Values, in $:											
1. Coal Lands	$534,543	$483,163	$444,326	$407,712	$357,705	$445,492	$319,044		$300,830		
2. Plant & Equipment	1,085,609	968,137	1,060,046	1,001,361	993,024	1,021,635	2,716,289		2,548,415		
3. Work in Progress	26,957(d)	19,345(d)	11,321(d)	402,824(e)	1,255,382	343,166	-		-		
Total	$1,647,109	$1,470,645	$1,515,693	$1,811,897	$2,606,111	$1,810,293	$3,034,333		$2,849,245		
I. Net Profit after FIT as percent of:											
1. Net Sales Realization	14.67	9.22	17.02	15.72	14.88	14.04	14.09	15.24	13.68	13.52	
2. Total Book Value	28.80	18.01	35.65	28.55	16.75	24.74	16.91		18.62		
J. Gross Cash Generation as percent of:											
1. Net Sales Realization	21.00	16.14	23.21	17.86	22.10	20.70	22.02	21.75	23.29	24.69	
2. Total Book Value	41.22	31.54	48.60	38.92	24.88	36.47	26.43		31.70		

FOOT NOTES:

Basis for Projection for 6 Years:

(a) Royalty: 391 tons @ $0.15 per ton $ 59

(c) Fee: 4,501,762 tons, Book Value $300,830

(b) Necessary Reinvestment estimated at $0.12 per ton for 3 years $270,129

$270,129 plus $1,586,955(f) is total amount to be depreciated. Assumed cost of Working Capital is 1.25 percent of Sales Realization. Estimated Salvage Value 6 years hence $1,300,000

(d) General Development.

(e) Includes $3,685 of General Development.

(f) Assumes that $1,000,000 remains in Capital Account at end of 6 years and is added to Salvage Value.

COMPUTATION OF VALUES
PERIOD

	First 3 Years		Last 3 Years		Total 6 Years	
Production in Tons	2,251,077		2,251,076		4,502,153	
Estimated Gross Cash Generation	($2,384,480	$1.0593	$2,384,479	$1.0593	$4,768,959	$1.0593
Less cost of Working Capital	120,714	0.0536	120,714	0.0536	241,428	0.0536
	2,263,766	1.0057	2,263,765	1.0057	4,527,531	1.0057
Less Reinvestment	270,129	0.1200	-	-	270,129	0.0601
Net Cash Generation	($1,993,637	$0.8857	$2,263,765	$1.0057	$4,257,402	$0.9456
Present Worth Factors	0.82895		0.82895			
			0.75131			
Present Worth as of 12/31/1959	($1,652,625		$1,409,869		$3,062,494	
Add present worth of Salvage Value					733,811	
Total Value as of December 31, 1959					$3,796,305	
Value per ton of Annual Production						$5.06

EXHIBIT G
VALUATION DATA
FIDELITY MINE

	Fiscal Years ending July 31st					Average for 5 Years	Fiscal Year ending 7/31/59	Five Months ending December 31st		Projection for 25 Years	
	1954	1955	1956	1957	1958			1958	1959		
A. Production in Tons	929,740	1,067,413	1,308,779	1,327,046	1,148,951	1,156,386	1,164,176	531,241	512,612	29,609,062	(1,184,362)
B. Total Cost of Production, Sales & Administration	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Amount	Per Ton
1. All costs other than	$2.8798	$2.6346	$2.6363	$2.9331	$2.9214	$2.7999	$3.1877	$2.9510	$3.3433	$94,748,998	$3.2000
2. Royalty	0.0228	0.0035	0.0162	0.0063	0.0297	0.0153	0.0268	0.0331	0.0079	426,826(a)	0.0144
3. Depreciation	0.3323	0.3824	0.3731	0.3751	0.3161	0.3574	0.2473	0.2318	0.2456	5,138,025(c)	0.1735
4. Sustained Depletion	0.0530	0.0538	0.0326	0.0524	0.0358	0.0450	0.0448	0.0401	0.0542	1,804,037(b)	0.0609
Total	3.2879	3.0742	3.0582	3.3669	3.3030	3.2176	3.5066	3.2560	3.6510	102,117,886	3.4488
C. Net Sales Realization	3.4509	3.1107	3.3643	3.7115	3.7605	3.4898	3.7654	3.7462	3.8301	112,514,436	3.8000
B. TotalCost	3.2879	3.0742	3.0582	3.3669	3.3030	3.2176	3.5066	3.2560	3.6510	102,117,886	3.4488
D. Pre Tax Profit	0.1630	0.0365	0.3061	0.3446	0.4575	0.2722	0.2588	0.4902	0.1791	10,396,550	0.3512
E. Federal Income Tax	0.0502	0.0183	0.0838	0.0991	0.1235	0.0772	0.0742	0.1336	0.0564	3,034,653	0.1025
F. Net Profit after FIT	0.1128	0.0182	0.2223	0.2455	0.3340	0.1945	0.1846	0.3566	0.1227	7,361,897	0.2487
AND:											
B-3 Depreciation	0.3323	0.3824	0.3731	0.3751	0.3161	0.3574	0.2473	0.2318	0.2456	5,138,025	0.1735
B-4 Sustained Depletion	0.0530	0.0538	0.0326	0.0524	0.0358	0.0450	0.0448	0.0401	0.0542	1,804,037	0.0609
G. Gross Cash Generation	$0.4981	$0.4544	$0.6280	$0.6730	$0.6859	$0.5969	$0.4737	$0.6285	$0.4225	$14,303,959	$0.4831
	($463,064)	($485,008)	($821,870)	($893,205)	($788,142)	($690,258)	($554,930)	($333,902)	($216,554)		
H. Book Values, in $:											
1. Coal Lands	$1,384,821	$1,417,544	$1,407,440	$1,433,522	$1,969,535		$1,948,711		$1,804,037		
2. Plant & Equipment	2,855,524	3,209,589	2,807,848	2,499,592	2,233,138		2,109,033		1,894,784		
3. Work in Progress	738,633(d)	2,505(e)	-	-	-		-		-		
Total	$4,978,978	$4,629,638	$4,215,288	$3,933,114	$4,202,673	$4,391,938	$4,057,744		$3,698,821		
I. Net Profit after FIT as Percent of:											
1. Net Sales Realization	3.27	0.58	6.61	4.79	8.88	5.57	4.90	9.52	3.20	6.54	
2. Total Book Value	2.10	0.42	6.90	8.28	9.13	5.12	5.30		4.09		
J. Gross Cash Generation as Percent of:											
1. Net Sales Realization	14.43	14.61	18.67	18.13	18.24	17.10	12.66	19.38	11.03	12.71	
2. Total Book Value	9.30	10.48	19.50	22.71	18.75	15.72	13.68		14.05		

FOOT NOTES:

Basis for Projection for 25 Years:

(a) Royalty: 6,097,513 tons @ $0.07 per ton $ 426,826
(c) Fee: 23,511,549 tons, Book Value $1,804,037
(b) Necessary Reinvestment estimated at $0.12 per ton for 22 years 3,126,717
$3,126,717 plus $2,011,308 is total amount to be depreciated. $5,138,025
Assumed cost of Working Capital is 1.25 percent of Sales Realization. $1,406,430
Estimated Salvage Value 25 years hence $ 300,000

(d) Includes leases at $2,739 and General Development at $7,376.
(e) This $2,505 is Coal Leases.

COMPUTATION OF VALUES

	First 22 Years		Last 3 Years		Total, 25 Years	
Production in Tons	26,055,975		3,553,087		29,609,062	
Estimated Gross Cash Generation	$12,587,484	$0.4831	$1,716,475	$0.4831	$14,303,959	$0.4831
Less cost of Working Capital	1,237,658	0.0475	168,772	0.0475	1,406,430	0.0475
	11,349,826	0.4356	1,547,703	0.4356	12,897,529	0.4356
Less Reinvestment	3,126,717	0.1200	-	-	3,126,717	0.1056
Net Cash Generation	$8,223,109	$0.3156	$1,547,703	$0.4356	$9,770,812	$0.3300
Present Worth Factors at 10 percent discount	0.39871		0.12285			
			0.82895			
Present Worth as of 12/31/1959	$3,278,636		$ 157,613		$3,436,249	
Add present worth of Salvage Value					27,690	
Total Value as of December 31,1959					$3,463,939	
Value per ton of annual production						$2.92

EXHIBIT D
VALUATION DATA
MARY MOORE MINE

	Fiscal Years ending July 31st 1957	1958	1959	5 Months Ending 12/31/1959	Projection for Nine Months - 1960 Calendar Year	
A. Production in Tons	335,532	303,304	307,301	149,569	209,199	
B. Total Cost of Production, Sales & Administration:	Per Ton	Per Ton	Per Ton	Per Ton	Amount	Per Ton
1. All costs other than B-2,B-3,B-4	$2.7390	$2.8316	$2.6019	$2.6156	543,505	$2.5980
2. Royalty	0.1088	0.0888	0.0002	-	-	-
3. Depreciation	0.4707	0.4432	0.5246	0.3779	82,365	0.3937
4. Sustained Depletion	0.0146	0.0256	0.0762	0.0605	12,187(b)	0.0583
Total	3.3331	3.3893	3.2029	3.0540	638,057	3.0500
C. Net Sales Realization	3.9635	4.0349	4.0748	3.8835	794,956	3.8000
B. Total Cost	3.3331	3.3893	3.2029	3.0540	638,057	3.0500
D. Pre Tax Profit	0.6304	0.6456	0.8719	0.8295	156,899	0.7500
E. Federal Income Tax	0.1513	0.1564	0.2286	0.2161	36,669	0.1753
F. Net Profit after FIT	0.4791	0.4892	0.6433	0.6134	120,230	0.5747
ADD:						
B-3 Depreciation	0.4707	0.4432	0.5246	0.3779	82,365	0.3937
B-4 Sustained Depletion	0.0146	0.0256	0.0762	0.0605	12,187	0.0583
G. Gross Cash Generation	$0.9644	$0.9580	$1.2441	$1.0518	$214,782	$1.0267
	($323,579)	($290,572)	($382,331)	($157,325)		
H. Book Values, in $:						
1. Coal Lands				$ 12,187		
2. Plant & Equipment				162,365		
3. Work in Progress				-		
Total				$174,552		
I. Net Profit after FIT as percent of Net Sales Realization					15.12	
J. Gross Cash Generation as percent of Net Sales Realization					27.02	

FOOT NOTES:

Basis for Projection:

(b) Fee: 209,199 tons, Book Value $ 12,187
Total amount to be depreciated $ 82,365
Assumed cost of Working Capital at 1.25 percent of Sales Realization $ 7,453
Estimated Salvage Value 9 months hence $220,000
Depreciated Value Plant and Equipment September 30, 1959 - $162,365
minus 82,365 or $ 80,000

COMPUTATION OF VALUES

Production in Tons	209,199	
Estimated Gross Cash Generation	$214,782	$1.0267
Assumed cost of working capital	7,453	0.0356
	$207,329	0.9911
Present Worth Factor 9 months at 10 percent annually	0.93023	
Present Worth as of 12/31/1959	$192,864	
Present Worth of Depreciated Value plus Salvage Value, (Total $300,000)	$279,069	
Total Value as of 12/31/1949	$471,933	

EXHIBIT E
VALUATION DATA

RAINIER MINE

		Projection for 12 Years	
A.	Production in Tons	9,471,469	(789,289)
		Amount	Per Ton
B.	Total Cost of Production, Sales & Administration:		
1.	Costs other than B-2, B-3, B-4	$32,314,048	$3.4117
2.	Royalty	433,041	0.0457(a)
3.	Depreciation	3,068,288	0.3240
4.	Sustained Depletion	1,123,352	0.1186(b)
	Total	$36,938,729	$3.9000
C.	Net Sales Realization	$49,725,212	$5.2500
B.	Total Cost	36,938,729	3.9000
D.	Pre Tax Profit	12,786,483	1.3500
E.	Federal Income Tax	4,603,921	0.4861
F.	Net Profit after FIT	8,182,562	0.8639
	ADD:		
B-4	Sustained Depletion	1,123,352	0.1186
B-3	Depreciation	3,068,288	0.3240
G.	Gross Cash Generation	$12,374,202	$1.3065
I.	Net Profit after FIT as percent of Net Sales Realization	16.46	
J.	Gross Cash Generation as percentof Net Sales Realization	24.89	

COMPUTATION OF VALUES

Production in Tons	9,471,469	
Estimated Gross Cash Generation	$12,374,202	$1.3065
Assumed cost of Working Capital, (1.25 percent of Sales Realization)	621,565	0.0656
	11,752,637	1.2409
Deduct Reinvestment	568,288	0.0600
	$11,184,349	$1.1809
Present Worth Factor, 12 years at 10 percent	0.56781	
Present Worth as ofDecember 31, 1959	$6,350,585	
LESS:		
Amount of original investment remaining to be made as of December 31, 1959	2,953,080	
	3,397,505	
PLUS:		
Present Worth of $1,500,000 12 years hence	477,945	
	$3,875,450	

FOOT NOTES:

(a)	Royalty: 1,732,163 tons @ $0.25	$ 433,041
(b)	Cost: 7,739,306 tons, Book Value	$1,123,352
	Necessary Reinvestment estimated at 9,471,469 tons @ $0.06 per ton	$ 568,288
	Estimated Original Investment in Plant and Equipment	$4,000,000
		$4,568,288
	Estimated Value, 12 years hence	$1,500,000
	Amount to be depreciated	$3,068,288
	Estimated total Original Investment in Plant& Equipment	$4,000,000
	Investment as of December 31, 1959	$1,046,920
	Remainder of Investment in Plant and Equipment to be made as of December 31, 1959	$2,953,080

SUMMARY OF VALUES

	Buckheart, Including KR & RT	Cuba	Fidelity	Mary Moore	Banner	Additional Assets Directly Connected with Mine Operation
Book Values as of December 31, 1959:						
Coal Lands, Fee	$2,220,410	$ 300,830	$1,775,037	$12,187	$1,123,352	-
Coal Lands, Purchase Options	-	-	29,000(b)	-	-	-
Plant and Equipment	2,806,267	2,586,955	2,002,917	162,365	135,584	$105,392(a)
Work in Progress	44,496	-	8,391	-	911,066	-
Total	$5,071,173	$2,887,785	$3,815,345	$174,552	$2,170,272	$105,392
Recoverable Coal Reserves:						
Owned in Fee	15,497,534	4,501,762	23,511,549	209,199	7,739,306	
Leased	6,569,618	391	6,097,513	-	1,732,163	
Purchase Options	-	-	-	-	-	
Total	$22,066,152	$4,502,153	$29,609,062	$209,199	$9,471,469	
Projections:						
Annual Production	1,298,067	750,359	1,184,362	209,199	789,239	
Estimated Life, Years	17	6	25	0.75	12	
Following are on per-ton basis:						
Estimated Sales Realization	$4.5300	$4.2900	$3.8000	$3.8000	$5.2500	
Estimated Total Costs	3.4381	3.4893	3.4488	3.0500	3.9000	
Estimated Profit before) Federal	1.0919	0.8007	0.3512	0.7500	1.3500	
Estimated Profit after) Income Tax	0.7085	0.5800	0.2387	0.5747	0.8639	
Estimated Gross Cash Generation	$1.0371	$1.0593	$0.4831	$1.0267	$1.3065	
Percentage of Sales Realization:						
Recovered as Profit after FIT	15.64	13.52	6.62	15.12	16.46	
Recovered as Gross Cash Generation	22.89	24.69	12.69	27.02	24.89	
Paul Weir Company's opinion of Value as of December 31, 1959	$9,160,413	$3,796,305	$3,463,939	$471,933	$3,875,490	

FOOT NOTES:

(a) The total amount, $870,693, of classification "General" is allocated by us. U.E.C. has not furnished break-down.

(b) Of this, $29,000, there is a balance due of $19,500. This balance due is not shown under Liabilities on the balance sheet.

Total Active Mines	Steel Barges	Farm Buildings & Equipment	Kingston River Terminal	Inactive Coal Reserves			Grand Total
					Strip	Underground	
$5,460,816				$1,912,885			$7,373,700
-							
7,799,750	$415,300(a)	$200,000(a)	$150,000(a)				8,565,050
963,953	-	-	-				963,953
$14,224,519	$415,300	$200,000	$150,000	$1,912,885			$16,902,703
51,459,350					22,280,018	3,352,628	77,091,996
14,399,685					1,840,310	27,075,682	43,315,677
-					-	2,218,621	2,218,621
$65,859,035					24,120,328	32,646,931	122,626,294
$20,768,040	$415,300	$200,000	$150,000	$1,912,885			$23,446,225

EXHIBIT G
INACTIVE COAL RESERVES

	Book Value of Fee	Payments Made on Purchase Options	TONS RECOVERABLE			
			Fee and Purchase Options	Leases	Purchase Contract	Total
STRIP:						
Fo Canton Field	$ 476,308	$492,073(a)	9,077,630		-	9,077,630
Industry Field	537,570	78,825(b)	9,626,717		-	9,626,717
Gayle	145,886	-	785,773	928,937	-	1,714,710
LeFlore County, Oklahoma	45,125	-	2,301,872	-	-	2,301,872
Buffalo Creek	100,000	-	488,026	911,373	-	1,399,399
Cuba	43,766(c)	-				
Buckheart	11,696(c)	-				
Perry County	1,135(d)	-				
Total Strip	$1,361,487	$570,898				
	570,898					
	1,932,385					
Less	19,500(e)					
Net Book Value	$1,912,885		22,280,018	1,840,310		24,120,328

(a) Unpaid balance of $365,987 on these purchase options. This is not shown as a liability on balance sheet.
(b) Unpaid balance of $ 52,500 on these purchase options. This is not shown as a liability on balance sheet.
(c) Represents coal under haulage roads.
(d) Should have been included with Fidelity or Gayle.
(e) Represents an overstatement by us on Book Value of Fidelity Coal Reserves. The $29,000 shown on Exhibit F should be $9,500.

	Fee	Leases	Purchase Contract	Total
UNDERGROUND:				
Buffalo Creek	314,316	3,769,581	-	4,083,897
Round Prairie	-	18,743,721	2,218,621	20,962,342
Vermillion County, Salt Fork	691,152	-	-	691,152
Vermillion County	1,795,360	-	-	1,795,360
Fidelity	551,800	4,562,380	-	5,114,180
Total Underground	3,352,628	27,075,682	2,218,621	32,646,931

Total Strip	24,120,328
Total Underground	32,646,931
Total Inactive Reserves, Strip and Underground	56,767,259

KOLBE DEPOSITION EXHIBIT 60

REGARDING NEED FOR ADDITIONAL STRIPPING EQUIPMENT AT FIDELITY MINE

In the so-called Green Pit where we are currently working, the overburden is such that the 1650-B can mine nearly all of it without any additional stripping equipment. Toward the end of the field, a helper would be desirable to maintain production and costs.

This Green Pit will be mined out within two to two-and-a-half years. Beyond that, the estimated reserves at Fidelity that can be stripped is 23,000,000 tons. Investigation of the three different areas comprising this 23,000,000 tons shows overburden depths and hard rock requiring a helper for the 1650-B to mine it out economically and to mine all of the 23,000,000 tons. Without a helper, our production would be reduced from the current rate of 180,000 tons per month to about 125,000 tons, with a resultant increase in cost. Also, of this 23,000,000 tons, there is approximately 10,000,000 tons that could not be mined at all with the one machine (1650-B). Therefore the need for additional equipment has been established.

We feel a wheel, properly designed to work with the 1650-B, is the answer. The following information and estimates have been developed.

1. Bucyrus-Erie has a standard design and has built a wheel for Peabody and one for Truax. It is high enough for us, but for our purpose certain modifications of design seem necessary. They put a price on their standard design of $2,500,000, and an estimate on transportation and erection of $400,000. While we don't know exactly what the change in design we would need would cost, they have indicated that the engineering and other factors involved would cost somewhere in the neighborhood of another $400,000. So it appears we are thinking about something over $3,000,000 for a Bucyrus machine in place and ready to operate.

2. We have built four wheels, three of which are now in operation. The W-2 is at Buckheart, the W-3 at Banner, and the W-4 at Cuba. The W-3 was originally at Fidelity Mine but because of the design of this particular machine, never proved successful there.
It was redesigned and moved to Banner and our cost and profit record there will indicate its satisfactory performance.
The wheels at both Buckheart and Cuba are doing a very satisfactory job.
3. We have all of the engineering information, blueprints and so forth necessary to build the type of wheel we need at Fidelity. This, of course, is quite a cost saving.
The machine would be built higher, the digging end longer, and the stacker end some longer and higher to place the dirt back far enough in deep overburden to avoid slides. We would use the base, motors and quite a lot of other material from the 5561 Marion shovel which is now used as a stand-by at Fidelity. You will recall the details of trading this machine in and then buying it back at a cost of $250,000, including all parts.
4. Utilizing our engineering knowledge, blue prints, and experience, and building the machine on the site, would effect considerable savings. The repair parts in inventory for the 5561 and also repair parts in inventory for Wheels 2, 3 and 4 would be available for the W-5 machine.
5. Our estimate of the total cost, using our own people for the engineering and supervision, and contracting for the welding, erection and so forth, is $1,500,000. This does not include any capital charge for the material used from the Marion 5561. This is on our books at $_____ today.
We feel our estimates are within reason but for contingencies and unexpected difficulties, we could add considerably and still be way below the cost of buying a wheel from Bucyrus-Erie.

In our five-year budget for capital expenditures, we included $_____ in 1966 and $_____ in 1967.

We can build this machine and have it in operation within fourteen months. The best estimate from Bucyrus is eighteen months and probably longer.

6. John Murray has prepared financial data on return on investment and so forth, which is attached hereto.

J. M. MORRIS

Noide Dep. Ex. 61 Id.
jhj 10-31-68

GOVERNMENT EXHIBIT Kol. Dep. 61

THIS AGREEMENT made and entered into at Pittsburgh, Pennsylvania the 5th day of September, 1956, by and between THE UNITED ELECTRIC COAL COMPANIES, a Delaware corporation having its principal office in Chicago, Illinois, (hereinafter called "United"), and ALUMINUM COMPANY OF AMERICA, a Pennsylvania corporation having its principal office in Pittsburgh, Pennsylvania, (hereinafter called "Alcoa").

WITNESSETH:

WHEREAS, Alcoa desires to obtain options to purchase the coal and coal mining rights in and under certain lands located in Perry County, State of Illinois, together with all other available minerals and mineral and mining rights in said land, and

WHEREAS, Alcoa desires that said options be obtained without disclosing the identity of Alcoa, and

WHEREAS, United has indicated its willingness to obtain said options in the name of United and hold said options in trust for Alcoa and thereafter at the request of Alcoa, assign and convey said options to Alcoa, and

WHEREAS, Alcoa shall, from time to time, desire United to perform or cause to be performed certain prospecting, drilling, exploration and other work on said lands or relating to said lands, and

WHEREAS, United has indicated its willingness to perform or cause to be performed such prospecting, drilling, exploration and other work,

NOW THEREFORE, United and Alcoa, in reliance upon the covenants herein contained, hereby covenant and agree as follows,

intending to be legally bound thereby:

1. United shall undertake to obtain, in its own name and without disclosing that it is acting for Alcoa, recordable and assignable options for the purchase of the coal and coal mining rights, together with all other available minerals and mineral and mining rights, in at least Eighteen Thousand (18,000) acres but not more than Twenty-Five Thousand (25,000) acres of land located east and north of Pinckneyville, Perry County, Illinois as outlined in red on the map marked "Exhibit A" and attached hereto, paying to the owner or owners of said land as consideration for each option so obtained the sum of One Dollar ($1.00) per acre of land. United shall, in so far as is practicable, obtain said options in such a manner that the optioned tracts of land will be contiguous and constitute a solid block.

2. Until United is otherwise directed, in writing, by Alcoa, each option so obtained by United shall be in the form marked "Exhibit B", attached hereto, and shall provide for the payment to the owner or owners of said land, in the event the option is exercised, of a total purchase price not to exceed the sum of Fifty Dollars ($50.00) per acre of land.

3. United shall without undue delay cause each option so obtained to be recorded in the appropriate records of Perry County, Illinois.

4. United does hereby acknowledge and declare that it will hold said option in trust for Alcoa, and that United will not claim to have any right, title or interest in said options to its own use or benefit. United does hereby covenant with Alcoa that it will, immediately after the same has been recorded, convey and assign and deliver each option so obtained by United to Alcoa or to such other person or corporation as Alcoa shall in writing nominate or appoint.

(5) At such time as Alcoa shall designate, United shall cause the optioned lands to be properly drilled on approximately one-half mile centers and shall cause the cores to be examined and logged by a competent consulting engineer. United shall cause the coal samples to be analyzed by Commercial Testing Laboratory in Chicago, Illinois and shall promptly deliver to Alcoa the results of such analysis.

(6) On or before the tenth day of each month, United shall invoice Alcoa for, and Alcoa shall thereafter promptly pay, such charges as shall be due and owing to United by Alcoa on account of performance hereunder by United during the previous month. Such charges shall consist of the following:

A. Payments made to the owners of land optioned in accordance with the terms hereof and the cost of recording the options.

B. Payments made for salaries and wages of persons employed by United solely for the purpose of obtaining options hereunder.

C. An amount which is equal to one and one-half times the portion of the salaries of United's engineering and land acquisition employees which is attributable to United's performance hereunder on the basis of actual time spent by such employees in performance hereunder.

D. The actual cost of causing the drilling, examination and logging of cores, and analysis of samples to be performed pursuant to Article 5 hereof.

E. Expenses incurred for meals, lodging, transportation, telephone and telegraph messages, engineering supplies and office supplies.

7. United shall, at any time upon receipt of written notice from Alcoa to do so, immediately cease, or temporarily suspend, the obtaining of options hereunder.

8. This agreement may be terminated by either United or Alcoa by giving thirty (30) days prior written notice of such termination.

9. In the event Alcoa decides to drop the options acquired under this Agreement, said options shall at the election of United be reassigned by Alcoa to United upon the reimbursement by United to Alcoa of all charges theretofore paid by Alcoa to United pursuant to the provisions of Paragraph 6 hereof, plus any renewal payments theretofore made on said options by Alcoa.

10. Notices to United provided for herein shall be deemed to be properly given when deposited in the United States mail, registered and postage prepaid, addressed to:

T. H. Latimer
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Notices to Alcoa provided for herein shall be deemed to be properly given when deposited in the United States mail, registered and postage prepaid, addressed to:

R. F. Miller, Mining Division
Aluminum Company of America
1501 Alcoa Building
Pittsburgh 19, Pennsylvania

11. This agreement shall inure to the benefit of and shall be

binding upon the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers the day and year first above written.

THE UNITED ELECTRIC COAL COMPANIES

Attest:

Secretary

By Frank P Kolbe
President

ALUMINUM COMPANY OF AMERICA

Attest:

Asst. Secretary

By Clarence Cuttingfield Jr
Vice President

State of Illinois)
) SS.
County of Cook)

I, Earl M Stughes, do hereby certify that on the 7th day of November, 1951, Frank P Kolbe and G H Hetterbach personally appeared before me and being first duly sworn by me severally acknowledged that they signed the foregoing document in the respective capacities therein set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the day and year before written.

(Seal)

Earl M Stughes

State of Pennsylvania)
) SS.
County of Allegheny)

I, Lolan Hughes, do hereby

certify that on the 5th day of September, 1947,
Lawrence Litchfield Jr. and Alfred M. Hunt
personally appeared before me
and being first duly sworn by me severally acknowledged that they
signed the foregoing document in the respective capacities therein
set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the
day and year before written.

(Seal)

Lola Hughes

LOLA HUGHES, NOTARY PUBLIC
MY COMMISSION EXPIRES
FEBRUARY 3, 1947

GOVERNMENT EXHIBIT Kol. Dep. A

Kolbe dep. ex. A

THE UNITED ELECTRIC COAL COMPANIES

Kolbe Dep 8-10
Ex A
10-18-28

COMPARISON BETWEEN TRUAX-TRAER COAL COMPANY

AND

THE UNITED ELECTRIC COAL COMPANIES

October 8, 1968

Herewith a comparison of ourselves and Truax-Traer based primarily on tons produced in each locality per annum showing what we would get in a merger and what we might be giving. The earnings by United and Truax per ton from the coal in each area should be the same over a period of time, as the overburden in each area is about the same on the average. Some years overburden will be much lower at one mine than another, resulting in lower stripping cost and lower blasting cost, but it will average out.

At present in Fulton County we are producing the same tons as Truax, but our potential reserves are 65 per cent greater, and ultimately this will be represented in production and sales. We are now building a new, larger wheel at our Cuba mine which will increase our capacity there 600,000 tons a year, and we are also considering the acquisition of a mine in the Banner area on the Illinois River just below Peoria. This mine is now producing 200,000 tons a year, and we might increase this to 700,000 tons. If we did this, our total capacity in Fulton County would be 3,300,000 tons, as compared with Truax's present 2,100,000. In Southern Illinois Truax has much larger reserves than we do, but I do not think this is a particularly good place to have reserves. Our Danville and Buffalo creek mines are very profitable mines, as profitable as or more profitable than similar mines in Fulton County. The Truax mines in West Virginia and North Dakota are out of our territory, and I do not know anything about them.

More of the benefits would come from the Truax properties than from our own. At present the tonnage from the Little Sister properties goes to the Little Sister washer and then goes by Burlington Railroad to the Truax dock. We would take this to Buckhorn and then down our railroad. At the Shakerag mine of Truax, the combined company might save money by putting in a washer to prepare only two sizes of coal, 2 x 6 and 2 x 0. The various other sizes could be produced at the Fidelity washer. This would mean for a cheap and economical-to-run washer at the Shakerag properties.

For a consolidated company, the West Virginia tonnage does not have as much purpose as in the present Truax company, as in a consolidated company it would be only a fifth of the total output, instead of a third, and if certain expansion that we are contemplating were put through, it would be only a sixth. Under these circumstances, it would be only the tail of the dog, with its own mining and selling problems that would be completely different from the problems of the other 80 per cent. I doubt whether under these circumstances it would get the same progressive, forward-looking attention that the other 80 per cent would, and whatever it did get might detract from the attention that should be given to the properties in the Middle West. With the present move toward consolidations in the East and toward acquisitions of property, it might be that this property could be sold and the funds distributed to the present Truax stockholders, or they might be given preferred stock.

If the Eastern properties were taken out, our relative productions would be as follows:

	United's Production	Trumm's Production	Excess of Trumm's Production Over United's
Fulton County Railroad - Profits in Tons of Coal Equivalent	300,000	-	(300,000)
Danville	300,000	-	(300,000)
Buffalo Creek	300,000	-	(300,000)
Total	3,000,000	2,100,000	(900,000)
Southern Illinois	1,500,000	2,500,000	1,000,000
Total	4,500,000	4,600,000	100,000
North Dakota	-	1,500,000	1,500,000

The earnings from the 6,100,000 would not be far different from the earnings from the 4,600,000.

We are in a position now to go ahead with some expansion, and if we did so, we would be sharing the benefits of this with Trumm. On the other hand, they would be paying their share of it. We have the possibility now of earning $3.50 or $4.00 a share from our present properties and of opening new mines which would increase these earnings. I just want to be sure that in a merger our earnings per share per annum would be increased.

COMPARISON OF NET INCOME IN YEAR ENDED JULY 31, 1956

United Electric earned $1,631,055 or $2.45 a share on 677,920 shares for the year ended July 31, 1956. Truax-Traer during its fiscal year ended three months earlier - April 30, 1956 - earned $3,212,618 which, after preferred dividends, was equivalent to $2.81 a share on the 1,149,530 shares of common stock outstanding at April 30, 1956. Included in the Truax earnings of $3,212,618 is $567,816 after taxes or 49 cents a common share realized from the sale during the year of coal lands in Western Kentucky. Excluding the capital gain and changing the year to July 31, Truax's earnings were $2,991,169. This is $2.20 per share on the 1,358,840 shares outstanding allowing for full conversion of the preferred but does not include shares recently issued for the acquisition of Little Sister. Based on earnings for the year ended July 31, 1956, United should get 1 1/10 shares of Truax but United's earnings last year do not reflect the present and future situations.

ESTIMATED NET INCOME FOR UNITED IN YEAR ENDED JULY 31, 1957

For the present fiscal year ending July 31, 1957, it is estimated that United Electric's earnings will be as follows:

Mine	Tonnage	Operating Income Per Ton	Operating Income Amount
Cuba	800,000	$1.00	$ 800,000
Buckhoart	1,300,000	.85	1,105,000
B.R. & R.T.	(1,200,000)	.25	300,000
Fidelity	1,500,000	.50	750,000
Mary Moore	300,000	1.00	300,000
Buffalo Creek	300,000	1.00	300,000
	4,200,000		$3,585,000
Less - Federal income taxes			1,100,000
Net income			$2,486,000
Net income per share on 677,920 shares			$ 3.62

United Electric is building a new wheel for Cuba which will increase the capacity of that mine by 800,000 tons. It is estimated that Cuba's costs will be reduced 10 cents to 15 cents a ton using the new wheel, and when the added capacity is sold, that will result in an additional cost reduction.

The north field at Buckheart has been opened, and United is about to move to that area. When this move is completed, Buckheart's costs will be reduced, as the average overburden ratio is 14 to 1 in the north field, compared with 15.9 to 1 during the past year.

At Fidelity the deepest overburden ratio is now being stripped. The average depth of overburden was 64 feet this past year, and some was 80 feet with very heavy rock. Across the road is 11 million tons under 80 feet.

CASH THROUGH AND WORKING CAPITAL POSITION

United Electric's working capital was $3,179,296 at July 31, 1956. An estimate of the increase in working capital for the fiscal year 1956 is as follows:

	Amount	Per Share
Additions:		
Net income from operations	$2,435,000	
Add depreciation and depletion	1,480,000	
	$3,905,000	$5.76
Reductions:		
Land payments	$ 460,000	
Plant and equipment purchases	500,000	
Dividends	678,000	
	$1,628,000	2.40
Estimated increase in working capital before other capital expenditures	$2,277,000	$3.36

At the end of the present fiscal year United Electric's working capital could be over $5,000,000, or the anticipated increase would be available to add new mines or for other purposes.

Truax-Traer's working capital April 30, 1956, was $9,886,184. Long-term indebtedness, of which United has none, was $3,816,622. Deducting cash received from this, to make figures comparable, would reduce Truax's working capital to $6,069,638.

United has followed a different policy in the purchase of coal lands in Fulton County. Truax has an investment in lands in Fulton County of $977,927. United has an investment of $4,095,068. United is now negotiating for the sale of this land which, if done, would increase its working capital.

United Electric's present mines are equipped to handle all the overburden at those mines without additional equipment, except for the expenditure of $1,250,000 for a new wheel at Cuba, which will increase the capacity of that mine by a half-million tons a year.

RESERVES

Fulton County and Adjacent Area

Fulton County is often called the most profitable coal-mining district in the United States. A comparison of the Fulton County area reserve tonnages of United Electric at July 31, 1956, and of Truax-Traer as of about a year earlier is as follows:

	Reserve Tons	Overburden Ratio
Cuba	6,505,939	18.6 to 1
North Canton	8,251,630	15.7 to 1
	14,757,569	
Duckheart	21,694,771	14.0 to 1
Banner	3,421,921	17 to 1
McDonough County	8,978,117	22.7 to 1
	12,398,038	
	48,720,608	

In addition to the above tonnage, United can probably acquire 10,000,000 additional tons in the North Canton area, 9,000,000 tons for Duckheart,

6,500,000 tons in the Banner area, and 1,000,000 tons in McDonough County - a total of 28,500,000 additional reserves. United Electric's reserves in this area would then be:

	Reserve Tons	Overburden Ratio
Cuba	6,805,239	
North Canton	18,251,630	
	24,737,569	
Buckheart	30,536,771	
Banner	9,621,021	
McDonough County	9,978,117	
	19,893,068	
	75,230,408	

United is now selling 2,100,000 tons per annum from Fulton County. The above reserves would give United a life in the Fulton County of 35 years. United is now building a wheel at Cuba which will increase this capacity to 2,600,000 tons per annum and is also considering the purchase of a mine in the Banner field with a present production of 200,000 tons a year which will later be increased to 700,000 tons making a total for this area of 3,300,000 tons per annum.

The Truax reserves in Fulton County are:

	Reserve Tons	Overburden Ratio
Platt	20,644,339	13.5 to 1
Little Sister	10,000,000	
	30,644,339	
Probable Future Acquisitions	15,000,000	
	45,644,339	

Truax is now selling 2,100,000 tons per annum from Fulton County. These reserves would permit Truax a life in Fulton County of 22 years.

Southern Illinois

In Southern Illinois United Electric and Truax-Traer have the following reserve tonnage:

	Reserve Tons	Overburden Ratio
United Electric:		
Fidelity	27,661,489	10.2 to 1
Annual Production	1,500,000	
Trunk-Treer:		
Shawnee - Pyramid	31,603,594	12.5 to 1
Burning Star - Strip	6,672,169	15 to 1
Sparta	10,571,000	11.2 to 1
Jamestown	18,302,400	9.3 to 1
Total Strip	67,152,143	
Burning Star - Drift	12,510,027	
Total Trunk	79,662,170	
Annual Production	2,500,000	

The foregoing reserve tonnages are as of July 31, 1956, for United Electric and as of about a year earlier for Trunk-Treer.

Mary Moore

At July 31, 1956, United Electric had reserve tonnage at the Mary Moore mine near Danville, Illinois, amounting to 1,118,583 at an average overburden ratio of 10.2 to 1. We are now obtaining options on an additional several million tons in this field.

Buffalo Creek

United Electric has reserve tonnages at Buffalo Creek at July 31, 1956, as follows:

	Reserve Tons	Overburden Ratio
Strip Coal	1,540,166	17.3 to 1
Deep Coal	5,762,668	

United as an option to acquire on a royalty basis from Jenkins Coal Mining Company additional reserves of #6 coal which are located about five miles from the Buffalo Creek property. The Jenkins property has possibly the largest reserves of #6 coal in Western Kentucky. About 2 million tons of #4 coal are also included in the option.

West Virginia and North Dakota

In addition to its Illinois mines, Truax has West Virginia and North Dakota properties:

West Virginia:	
Reserves	187,280,153
Production Year Ended April 30, 1956	2,489,905
North Dakota:	
Reserves	103,209,828
Production Year Ended April 30, 1956	1,676,836

Miscellaneous

United Electric owns or controls 1,724,998 tons of strip coal in Ohio County, Kentucky; 2,301,872 tons of strip coal in Oklahoma; 1,795,360 tons of deep coal in Vermilion County, Illinois; and 883,084 tons of deep coal in Perry County, Illinois, leased to Union Electric.

RECAP

United Electric with its present mines can produce 4,500,000 tons and could earn $2,700,000 or $4.00 a share on this production. These earnings assume that we can build up our summer business in Fulton County.

United Electric in 1958 will increase its capacity 800,000 tons per year through the operation of its new wheel at the Cuba mine. It is believed this additional coal can be sold to the new power plant to be built by the Central Illinois Light Company in Peoria or to other customers.

United Electric may also open a new mine in the Banner Field on the Illinois River near Peoria. This coal, when washed, would have 12,000 B.T.u's. This would be West Kentucky coal on an Illinois River freight rate. This coal would have a market value at utility plants on Lake Michigan of $4.50 a ton. Our profit might run $1.50 a ton and be greater than at any mine we now have. The total profit in this field might be $1,050,000 a year, or $700,000 after taxes.

If the Jenkins field works out as we think it may, it would be a very substantial earner, as this coal sells for $5.50, and with the sort of equipment that we are thinking of for this field, we should earn $2.00 a ton before taxes. We could probably sell 600,000 tons a year from this mine on which the earnings after taxes would be $500,000.

The additional net income from these two properties might be $2.00 a share on our stock.

TRUAX-TRAER COAL COMPANY
AND
THE UNITED ELECTRIC COAL COMPANIES
ANNUAL SALES IN TONS

Year Ended April 30, 1956

		Truax-Traer	United Electric
Fulton County:			
Pratt	1,521,547		
Little Sister	636,502	2,158,049	
United Electric			1,900,231
Mary Moore			200,023
Buffalo Creek			312,725
		2,158,049	2,412,979
Southern Illinois		2,379,581	1,217,025
		4,537,630	3,630,004
West Virginia		2,469,805	
North Dakota		1,476,966	
Total		8,484,401	3,630,004

Our railroad has a net profit before taxes of $300,000 which is the amount of profit that could be made from 300,000 tons of coal.

Profitwise we now have the equivalent of 3,950,000 tons of coal from present production and with Banner and Jenkins present production added this would be 4,450,000 tons. With Banner and Jenkins operating the way we might develop them, our production would be greater.

Present United Electric and Truax-Traer-Little Sister Properties
(Does not include Banner or Jenkins acquisitions)

If United Electric were to receive 1 1/10 shares for each share of Truax, the consolidated company would have 2,280,000 shares, of which United would have 750,000 shares, or a third:

	United's Present Production	Consolidated Companies' Production	United's Share in Consolidated Production 1/3 of Total Tons
Fulton County	2,100,000	4,200,000	1,400,000
Railroad - Profit in Tons of Coal Equivalent	300,000	400,000	150,000
Danville	300,000	300,000	100,000
Buffalo Creek	300,000	300,000	100,000
	3,000,000	5,200,000	1,750,000
Southern Illinois	1,800,000	4,000,000	1,335,000
	4,800,000	9,200,000	3,085,000
West Virginia	-	2,600,000	833,000
North Dakota	-	1,500,000	500,000
Total Tons	4,800,000	13,200,000	4,418,000

United would give up the earnings from 1,280,000 tons of Fulton County or equivalent production and 167,000 tons of Southern Illinois production; it would receive the earnings of 1,333,000 tons of West Virginia and North Dakota production.

Present United Electric and Truax-Traer-Little Sister Properties
(Does not include Hamer or Jenkins acquisitions)

If United were to receive 1 1/2 shares of Truax-Traer, the consolidated company would have 2,500,000 shares, of which United would have 1,000,000 shares, or 40 per cent:

	United's Present Production	Consolidated Companies' Production	United's Share in Consolidated Production 40 Per Cent
Fulton County	2,100,000	4,200,000	1,680,000
Railroad - Profit in Tons of Coal Equivalent	300,000	450,000	180,000
Danville	300,000	300,000	120,000
Buffalo Creek	300,000	300,000	120,000
	3,000,000	5,250,000	2,100,000
Southern Illinois	1,500,000	4,000,000	1,600,000
	4,500,000	9,250,000	3,700,000
West Virginia	-	2,500,000	1,000,000
North Dakota	-	1,500,000	600,000
Total Tons	4,500,000	13,250,000	5,300,000

United would give up 800,000 tons of Fulton County production or equivalent production and receive 100,000 tons of Southern Illinois production along with 1,600,000 tons of West Virginia and North Dakota production.

United Electric with Banner and Jenkins mines and Truax-Traer with Little Sister

If United Electric were to receive 1 1/10 shares for each share of Truax, the total capitalization of the new Truax would be 2,250,000 shares, of which United would receive 750,000 shares, or a third:

	United's Present Production with Banner and Jenkins Developed	Consolidated Companies' Production	United's Share in Consolidated Production 1/3 of Total Tons
Present Production:			
Fulton County	2,100,000	4,200,000	1,400,000
Railroad - Profit in Tons of Coal Equivalent	300,000	450,000	150,000
Danville	300,000	300,000	100,000
Buffalo Creek	300,000	300,000	100,000
	3,000,000	5,250,000	1,750,000
Likely Production			
Banner	700,000	700,000	233,000
Jenkins	600,000	600,000	200,000
	4,300,000	6,550,000	2,183,000
Southern Illinois	1,500,000	4,000,000	1,333,000
	5,800,000	10,550,000	3,516,000
West Virginia	-	2,600,000	833,000
North Dakota	-	1,600,000	500,000
	5,800,000	14,550,000	4,849,000

United would give up 2,284,000 tons of Midwestern production for 1,333,000 tons of West Virginia and North Dakota production.

United Electric with Banner and Jenkins Mines
Truax-Traer with Little Sister

If United were to receive 1 1/2 shares of Truax-Traer, the total new capitalisation would be 2,600,000 shares, of which United would get 1,000,000 shares, or 40 per cent:

	United's Present Production with Banner and Jenkins Developed	Consolidated Companies' Production	United's Share in Consolidated Production 40 Per Cent
Present Productions:			
Fulton County	2,100,000	4,200,000	1,680,000
Railroad - Profit in Tons of Coal Equivalent	300,000	450,000	180,000
Danville	300,000	300,000	120,000
Buffalo Creek	300,000	300,000	120,000
	3,000,000	5,250,000	2,100,000
Likely Productions:			
Banner	700,000	700,000	280,000
Jenkins	600,000	600,000	240,000
	4,300,000	6,550,000	2,620,000
Southern Illinois	1,500,000	4,000,000	1,600,000
	5,800,000	10,550,000	4,220,000
West Virginia	-	2,600,000	1,000,000
North Dakota	-	1,500,000	600,000
Total Tons	5,800,000	14,665,000	5,820,000

United would exchange 1,580,000 tons of Midwestern tonnage for an equivalent amount of West Virginia and North Dakota tonnage.

KOLBE DEPOSITION EXHIBIT E

REPORT ON PROPOSED MERGER

ILLINOIS OPERATIONS

TRUAX-TRAER COAL COMPANY

JANUARY 1956

THERON G. GEROW

MINING CONSULTANT AND ENGINEER

307 North Michigan Avenue
Chicago 1, Illinois

THERON G. GEROW

MINING CONSULTANT AND ENGINEER

307 North Michigan Avenue
Chicago 1, Illinois

Telephone: FInancial 6-0288

January 30, 1956

Mr. A. H. Truax
President and Chairman of the Board
Truax-Traer Coal Company
111 North Wabash Avenue
Chicago, Illinois

Dear Mr. Truax:

In this cover are my findings and estimates of the strip mining possibilities and economic opportunities in the Fulton and Perry County areas of Illinois.

I believe the report to be realistic, conservative and to present a fair estimate of operational opportunities together with indicated savings possible, based on current information.

In my opinion the operational savings possible contained in this report, together with economies indicated and apparent which should be developed from a separate tax and financial study, make the proposed merger most attractive and sound. Every effort should be made to consummate the combination.

Yours very truly,

/s/ Theron G. Gerow
THERON G. GEROW

TGG:cr

INDEX

PART I SUMMARY AND CONCLUSIONS _____

PART II SCOPE OF REPORT _____

PART III MINING OPERATIONS _____

Fulton County _____

Perry County _____

Re-Cap of Estimated Operating Savings _____

PART IV SELLING AND ADMINISTRATION _____

Estimated Total Savings _____

PART V CAPITAL EXPENDITURES _____

PART VI EXHIBITS _____

PART I

SUMMARY AND CONCLUSIONS

This section is presented first rather than at the end to aid in a quick digest of the report and to serve as a ready reference to the more important points of its contents.

SUMMARY (Operational)

Fulton County

1. The combined Fulton County tonnage of Truax-Traer, United Electric and Little Sister was 4,040,936 tons for the 12 months period December 1, 1954 to November 30, 1955. (See Exhibit I)
2. This tonnage was processed over 4 preparation plants from 4 mining operations.
3. The combined reserves of the three companies total about 59,000,000 tons.
4. The combined potential tonnage is estimated at 76,000,000 tons or a life at the present rate of production of 19 years.
5. Unlike most mergers the reserves and operations of the three companies are extremely closely related and their reserves practically contiguous. Such a close interlocking of interests presents many opportunities for operation improvements and economies.
6. Of the combined Fulton County production 2,466,728 tons moved over the Illinois River facilities.
7. River tonnage other than from Buckheart moved at a freight disadvantage over Buckheart's cost of operating their own rail and river facilities.
8. 1954 production at Buckheart has demonstrated a potential single shift capacity at 225 operating days of 1,125,000 tons. This tonnage can be

increased either by improving daily capacity or by working more days.

9. Without question a double shift operation at Buckheart would be more economical in every way; would more than take care of the present combined river tonnage and would provide a foreseeable life of about 10 years. The mine has a reserve of approximately 25,000,000 tons.
10. Of the remaining Fulton County reserves totalling about 51,000,000 tons in the Canton-Fiatt-Cuba triangle, 11,500,000 tons lie within a 3 mile radius of the Fiatt Tipple and a total of at least 17,500,000 tons within a 4 mile radius.
11. At 1954 rates of production, Fiatt has demonstrated a production capacity of 1,460,000 tons based on 225 working days, and in the 12 month period to November 30, 1955 produced 1,503,850 tons working 235 days, almost exactly the difference between present Fulton County requirements and the Buckheart double shift capacity.
12. The Fiatt and Buckheart Tipples can produce the present Fulton County combined tonnage requirements for the next 11 to 12 years.
13. Two tipples will adequately produce the present combined Fulton County tonnage requirements. The St. David and Cuba Tipples can almost immediately be shut down.
14. The balance of the reserves or about 33,500,000 tons (Exhibit III) center on a point near the old Eagle Mine just west of Canton. In addition there are about 1,000,000 tons in the Skyrocket area which should logically be produced through the Buckheart Tipple.
15. Of the 33,500,000 tons concentrated in a block just west of Canton about 80% lie within a 2 mile radius and almost 100% including most of the Cuba reserves lie within a 3 mile radius of the proposed East Field Tipple site. More coal property is adjacent to the block and is available.

16. There is a logical location for a new tipple to handle the 33,500,000 ton reserve directly west of Canton near the T.P. & W. Railroad where a C.L. & Q. connection is also possible.
17. If a T.P. & W. rail connection is desirable or important, such a route has previously been surveyed into the Fiatt Tipple.
18. Discussion of the Cuba Tipple and other operational problems are carried in Part III—Mining Operations.
19. The opportunities and possibilities of operational advantages and economics are very apparent under merged interests of Truax-Traer, United Electric and Little Sister in the Fulton County area.
20. In addition to general merged interests there are many economies possible such as better application of the several units of stripping equipment available, the use of higher capacity trucks, double shift, etc.

Perry County

1. The combined Perry County tonnage of Truax-Traer and United Electric was 2,245,613 tons for the 12 month period December 1, 1954 to November 30, 1955. (See Exhibit I)
2. This tonnage was processed over two cleaning plants from three mining operations.
3. The combined reserves of the two companies in Perry County are 54,379,389 tons with a combined potential of at least 56,000,000 tons or a life at present rates of production of about 25 years.
4. Again, as in Fulton County, these reserves are very closely integrated, being only separated by the Illinois Central Railroad and are practically all contained within a circle of 3 miles radius centering along the I.C. tracks near William Creek.

5. The Pyramid Mine is within about a year of working out.

6. Burning Star Mine No. 2 is under a 25¢ per ton burden in shipping coal to the Pyramid Tipple for cleaning. This cost will also be added to the Pyramid tonnage unless a new tipple location becomes available promptly.

7. Truax-Traer must definitely make a decision very shortly as to a new tipple site.

8. The Fidelity Tipple has a demonstrated capacity based on 225 working days of about 1,135,000 tons. Double shift, it would more than take care of combined present tonnage requirement. However, it is a relatively high cost tipple.

9. The Fidelity Mine is now hauling on radii of 3 and 4 miles with most reserves at the 4 mile radius. It cannot reach Truax-Traer reserves under a 5 to 6 mile radius.

10. One Tipple on a double shift basis properly located can adequately process Perry County tonnage requirements.

11. It seems logical for maximum economy, operational advantages and long range planning to consider a new modern and throughly efficient tipple near the center of some 56,000,000 tons of coal reserves.

12. Discussion of the Perry County tipples is carried under Part III—Mining Operations.

13. There is a splendid opportunity for operational advantages and economies in merged Perry County operations of Truax-Traer and United Electric.

14. In addition to apparent economies from merged operations there are many other operational savings possible from the use of high capacity haulage units, double shift, more economical use of available stripping units, etc.

CONCLUSIONS

1. From the Summary above and the study carried in the body of the Report there seems every reason from an operational point of view to merge the interests of Truax-Traer, United Electric and Little Sister in Fulton County, Illinois and Truax-Traer and United Electric in Perry County, Illinois.
2. Operational advantages and economies resulting will be substantial.
3. Sales advantages will provide better coverage of the market areas at considerable savings in cost of sales per ton.
4. Administration and management should be able to function more capably and efficiently at a considerable savings in cost per ton.
5. Results of merged interests, without the scope of this report, such as tax advantages, write-off of obsolete or non-profitable equipment and operations, stock values, financial factors, etc., are all very fertile fields of investigation which will produce additional savings.
6. No adverse or detrimental factors which might affect the proposed merger have come to light in this preliminary study.

RECOMMENDATIONS

1. Merge Truax-Traer Coal Company, United Electrict Coal Companies and Little Sister Coal Company.
2. In Fulton County:
   (a) Double shift the Buckheart Mine for full production of river shipments.
   (b) Shut down the Cuba Mine and move its stripping and loading equipment to Buckheart for added mining capacity.
   (c) Process the Skyrocket reserves of Little Sister Coal Company over the Buckheart

Tipple. 60% of Little Sister's tonnage presently moves to the River.

(d) Shut down the St. David operations of Little Sister and make available the 40 yd. 5561 Marion stripping shovel to the Fiatt operation.

(e) Operate the Fiatt Mine full single shift capacity at about 235 working days for the balance of Fulton County tonnage requirements.

(f) Install 50 ton or larger haulage units at both Fiatt and Buckheart mines.

(g) Engineer and plan new tipple at a site directly west of Canton for production of remaining reserves, including Cuba and Little Sister, to be ready in about 10 years or sooner if production demand requires.

(h) Consider T.P. & W. rail connection to Fiatt Tipple.

(i) Consolidate and streamline all Fulton County supervision, engineering, management and administration.

3. In Perry County:

(a) Plan and build a centrally located tipple to handle the combined Perry County tonnage, to be ready as soon as possible.

(b) Shut down the Fidelity and Pyramid Tipples.

(c) Double shift the new tipple.

(d) Replace all haulage equipment with 50 ton or larger units for double shift service.

(e) Provide both Illinois Central and Missouri Pacific rail connections to the new tipple.

(f) Consolidate and streamline all Perry County supervision, engineering, management and administration.

4. Combine and streamline all sales, management, administration and accounting departments and functions of Truax-Traer and United Electric for maximum efficiency and economy.

5. Study, under capable direction, the possibilities under a merger of tax and financial advantages.

ESTIMATED SAVINGS

A summary of estimated savings possible under a merger of Truax-Traer and United Electric also Little Sister in Fulton County follows. Only the effect of advantages in Fulton County and Perry County, Illinois have been considered. Details and basis of estimates are carried in Part III—Mining Operations and Part IV—Selling and Administration.

Estimated Savings

Fulton County Operations	$2,022,515.00
Perry County Operations	1,178,935.00
Selling and Administration	575,240.00
Market Stability	730,000.00
Total	$4,506,690.00

It may be well to call attention to the fact that the above total on factors covered by this report represents $2.00 a share or more on the combined shares of stock of Truax-Traer and United Electric giving credit for the inclusion of Little Sister and perhaps some stock adjustment.

ESTIMATED CAPITAL EXPENDITURES

A preliminary estimate of capital investments required to accomplish the above savings is as follows:

Fulton County	$ 985,000.00
Perry County	2,453,000.00
Total	$3,438,000.00

It should be clearly pointed out, however, that Truax-Traer is faced with an estimated expenditure of about $2,688,000.00 in any event with only relatively minor savings resulting. Hence:

CAPITAL EXPENDITURES
CHARGEABLE TO MERGER—$750,000.00

In my opinion, based on the above study, such a merger would result in a substantial increase in both dividends and market value to stockholders of both companies due to increased efficiency of operations and substantial savings possible in practically all departments of the combined companies.

The present trend and ultimate solution to a sound and economic coal industry is fewer and larger coal companies under competent and far seeing management with a willingness to meet and solve the problems of the industry cooperatively.

Respectfully submitted,

/s/ Theron G. Gerow
THERON G. GEROW
Mining Consultant and
Engineer

PART II

SCOPE OF REPORT

This report attempts to evaluate the operational advantages and economics possible under merger operations and interests of Truax-Traer Coal Company, The United Electric Coal Companies and Little Sister Coal Corporation.

Interests of the three companies are only interlocked in Illinois. The three companies are very closely related in both mining and sales in Fulton County and Truax-Traer and United Electric in Perry County.

The nearly contiguous and interlocked situation of the mining operations and coal reserves in both counties presents unusual opportunities for economics and operational savings in practically all departments of the companies, a condition not generally found in the consideration of coal mergers.

Therefore, for the purposes of this preliminary report, its scope is limited to the following:

1. The report is limited to a study of Fulton and Perry Counties, Illinois.
2. All other operations of the companies involved are separate and must stand on their own as to final value to the proposed merger.
3. For the present such separate operations can be assumed to contribute to the merged company in proportion to their present contribution to the parent company.
4. The report is based on data and information furnished by Truax-Traer, United Electric and Little Sister coal companies, and estimates where exact information was lacking.
5. The reports attempts to form a basis for the most economical consolidated operation of the several Mines involved.
6. The report attempts to point out and evaluate combined long-term possibilities, advantages and economics of operation.
7. The report does not cover any tax or financial advantages that will undoubtedly result from such a merger.
8. The report does not cover the probable effect on stock dividends or market value of stock.
9. The report only covers in a general way the effect of combined management, sales and administrative functions, giving credit chiefly to the accrued benefits resulting from merged Illinois interests.
10. The report does not attempt to make any estimates or evaluate the probable equities of the three companies in the proposed merged company.

PART III

MINING OPERATIONS

Consideration of mining operations of Truax-Traer Coal Company, The United Electric Coal Companies and Little Sister Coal Corporation under a proposed merger

is limited to Fulton and Perry Counties in the State of Illinois.

Other mining operations of Truax-Traer and United Electric are, for the purposes of this report, assumed to contribute to the merged company in proportion to their present contributions to their parent companies. No major operational savings would be expected from such other operations as a result of a merger.

The situation in both Fulton and Perry Counties, Illinois is considerably different and probably unique in merger consideration. The reserves of the companies are contiguous and mining operations contained in a circle of relatively small radius in both counties. (See Exhibits III and IV).

Operating conditions, coal quality, preparation plants, equipment, methods of operation, costs, etc. are either identical or nearly so in each county.

Joint operations in Illinois naturally divide themselves for study into the Fulton County area (Exhibit III) and the Perry County area (Exhibit IV) and will be so analyzed.

FULTON COUNTY

The combined production of the three companies in Fulton County for the 12 months prior to November 30, 1955 was 4,040,936 tons, of which 2,466,728 tons were shipped via the Illinois River over dock facilities of the companies.

The coal was produced from 4 separate operations over 4 tipples. All operations and coal reserves are contained in a circle of approximately a 9 mile radius.

Owned and leased coal reserves in this area total 59,-000,000 tons and a conservative estimate of a potential reserve is 76,000,000 tons.

The Buckheart Mine of United Electric has its own rail and dock facilities for river shipments. The other mines are under a cost handicap on river shipments having to add either a Burlington handling charge to the Buckheart facilities or the established rail rate to the Liverpool Dock owned and operated by Truax-Traer.

This is important as over 60% of the combined Fulton County tonnage moves via the Illinois River.

Please refer to Exhibit III for a clearer picture of the mining situations of the several mines which follows.

Fiatt Mine (Truax-Traer)

The Fiatt Mine produced 1,603,850 tons in the 12/1/54 to 11/30/55 period and worked 235 days.

It has proven average tipple capacity of 6500 tons per shift which for 225 days of work indicates a single shift potential of 1,460,000 tons annually.

The Fiatt Mine has the best operating conditions and is the lowest cost operation in the area.

The Tipple has had recent improvements and additions which have brought its capacity up to the highest of the four tipples being considered and costs are well in line and actually slightly below United Electric's average Fulton County preparation costs.

The mine has a reserve tonnage of 20,444,339 tons, of which 11,500,000 tons of low overburden coal are within a 3 mile radius with an average radius haul of less than 2½ miles.

The potential tonnage adjacent to the Tipple, including Little Sister's Cuba acreage at a 4 mile average haul, will exceed 17,500,000 tons giving an indicated life of low cost coal at maximum single shift operation of about 11½ years.

Fiatt has already made a start on large capacity haulage trucks with six 45 ton units. A high capacity haulage fleet will materially reduce haulage costs at the mine.

To haul 6500 tons an average of 3 miles, ten 50 ton units are indicated plus two extra for repair and maintenance, making a total of 12 to replace 22 older units. Six more units will probably cost about $300,000.00.

The balance of Fiatt's coal reserves, approximately 9,000,000 tons, lies in the so-called East Field centering at a point 5 miles air line from the Fiatt Tipple, along the T.P. & W. Railway just west of Canton

and the old Eagle Mine and within reach of the "Yard Limits" of Canton.

The East Field in addition to the 9,000,000 tons of reserves has another 9,000,000 virtually surrounded by its acreage with another 3,000,000 tons or more of adjoining potential. Hence the East Field has a potential tonnage reserve of 21,000,000 tons.

The East Field operating conditions will not be as favorable as for the tonnage adjoining the Fiatt Tipple being more nearly comparable to the St. David area of Little Sister which joins on the south and the Cuba reserves of United Electric which likewise joins Little Sister reserves to the west.

Including Little Sister's St. David area and United Electric's Cuba reserves together with other available coal, presents a picture of at least 33,500,000 tons of reserves, about 60% of which lie within a 2 mile radius circle of the location described above, about 80% within a 3 mile circle and only 20% or less requiring a 4 mile haul.

With a foreseeable cost of the East Field substantially more than Fiatt's present cost, certainly it is logical to plan for recovery of this large reserve at the lowest possible cost over new facilities including high capacity mining units and a low cost tipple favorably located.

The suggested location west of the Canton city limits can be served by both the T.P. & W. and C.B. & Q. railroads, which will probably be a requirement.

A rail connection has previously been surveyed from the T.P. & W. tracks to the Fiatt Tipple, should such a connection become desirable for the next 10 years.

Cuba Mine (United Electric)

The Cuba Mine produced 751,575 tons in the same period (12/1/54-11/30/55) working 194 days.

It has an indicated average tipple capacity of 3875

tons per shift. On a 225 day year the indicated annual shift capacity is 872,000 tons.

From available information, Cuba's tipple and preparation costs are somewhat lower than the other mines but their total operating cost is 52¢ a ton higher than at Fiatt.

The mine has a reserve of 7,430,910 tons of relatively high stripping cost coal at about a 4 mile radius haul from the tipple, which at the present rate of production would indicate a life of about 10 years.

There are no other potential reserves available to Cuba other than the Little Sister reserves. Certainly operation of either of Little Sister's reserves, through the Cuba Tipple, would tend to increase rather than decrease operating costs.

There seems no other hope of a substantial reduction in Cuba's costs other than to produce the remaining reserves over a relocated tipple designed for maximum economy and working double shift for greatest efficiency.

It seems logical to consider future operations of the Cuba reserves in conjunction with the East Field for long range planning and greatest economy.

Little Sister Mine

The Little Sister Mine produced 668,319 tons in the 12 month period to 11/30/55 over the St. David Tipple working 173 days.

The indicated average tipple capacity is 3755 tons per shift which would give a maximum of 845,000 tons annually working 225 days single shift.

Coal was produced from two pits, the 550-B operating in the Skyrocket area and the 5561-M with dragline help operating the St. David area.

The Skyrocket area has about 1,100,000 tons in reserve with good pit conditions and an average radius haul of about 2 miles.

This pit should produce good costs and it seems logical to exhaust the reserves over the Buckheart

Tipple. A suitable underpass at the Burlington tracks and State Highway would have future value for right of way for a rail connection from the East Field to the River.

The St. David area joining the East Field of Truax-Traer has heavy pit conditions, a 4 mile radius haul and about 4,250,000 tons in reserve. It appears logical to shut this pit down and work it more economically at some future date in conjunction with the East Field.

Continuing as at present, the combined Little Sister reserves, excluding Cuba, would be exhausted in about 7 years.

Buckheart Mine (United Electric)

The Buckheart Mine produced 1,117,192 tons in the period 12/1/54 to 11/30/55 working 236 days.

It has an indicated average tipple capacity of 4734 tons per shift which at 225 single shift work days would give an annual single shift potential of 1,065,-150 tons. This capacity can be improved either by better daily capacity or working more days.

From presently available figures, Buckheart is operating at a 44¢ per ton higher cost than the Fiatt Mine of Truax-Traer. (See Exhibit I).

Buckheart has rail and dock facilities for river shipments which allows the mine to enjoy about a 30¢ per ton advantage over the other Fulton County mines.

Buckheart has a reserve of 22,380,668 tons and a potential of about 25,000,000 tons of relatively high stripping cost coal, most of it lying within a 4 mile radius haul with the average about 3½ miles straight line from the tipple. At present rates of production this reserve will last about 21 years.

The Buckheart Tipple has had recent improvements added. On a double shift basis, it should produce upwards of 2,400,000 tons which is approximately the combined River tonnage requirement of the three companies.

With an average pit haul of about 4 miles and a shift capacity of 4734 tons, 9 or 10 coal haulers of 50 tons capacity would be required. It would cost about $600,000.00 to modernize the truck fleet.

FULTON COUNTY CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. There is an unusual opportunity for substantial economic savings as well as physical operating benefits to be derived from a merger of Truax-Traer, United Electric and Little Sister in Fulton County.
2. The combined tonnage of 4,040,936 tons can within a short period of time be comfortably produced over 2 tipples.
3. It would seem entirely possible to bring the Buckheart Tipple up to 5000 tons capacity per shift, if not, more days can be worked all on a double shift basis to produce the 2,500,000 tons required for river shipments.
4. The Cuba stripping equipment should provide the necessary extra strip coal at Buckheart.
5. The Fiatt potential capacity of over 1,500,000 tons on single shift working 235 days almost exactly produces the balance of the Fulton County present requirements. (See Exhibit II). It is possible to work more days for added production.
6. With a total of 76,000,000 tons potential reserve in Fulton County, it becomes highly important to practice the most efficient operating procedures possible together with careful marketing. A fluctuation of 10¢ per ton on either sales realization or operating cost means a gain or loss of $7,600,000 in value.
7. The East Field should be carefully developed for maximum economy in operating costs and market conformity.

8. There are substantial savings to be realized in combined supervision, engineering and administration in Fulton County.

Recommendations

1. Merge the operations and interests of Truax-Traer Coal Company, The United Electric Coal Companies and Little Sister Coal Corporation in Fulton County.
2. Shut down the Cuba Mine and move its stripping equipment to Buckheart.
3. Shut down Little Sister's St. David area and make its stripping equipment available to Fiatt. Process the Skyrocket area coal over the Buckheart Tipple.
4. Double shift and improve capacity and mine costs at Buckheart for full production of River Coal.
5. Operate the Fiatt Mine for full single shift capacity of Fulton County rail requirements.
6. Put in T.P. & W. rail connection to Fiatt if required.
7. Plan a new tipple and site for the mining of the East Field to be ready to replace Fiatt in approximately 10 years, or earlier if market conditions warrant.
8. Modernize and improve costs wherever it is economically possible.
9. Consolidate Fulton County supervision, engineering and administration for best efficiency and economy.

ESTIMATED FULTON COUNTY SAVINGS

1. *Shut Down the Cuba Mine.*

About 86,000 tons of Cuba production moved via Buckheart and the River. This tonnage would be supplied by Buckheart.

Present Buckheart costs are 8¢ a ton lower than Cuba. (Exhibit I).

$.08 x 86,000 $ 6,880.00

A transportation item amounting to $1.03 was charged against Cuba River coal (excluding normal Buckheart River costs).

$1.03 x 86,000	$ 88,775.00

The balance of Cuba's production or about 665,500 tons of all rail coal will be supplied from Fiatt at a 52¢ lower operating cost.

$.52 x 665,500	$346,060.00

Cuba's tipple, track and haulage road maintenance runs over $175,000.00 a year. Assume 40% transferred to Buckheart for second shift operation. 60% of the cost would be saved.

.60 x $175,000.00	$105,000.00

Mine office salaries, supervisory, engineering and general overhead run upwards of $150,000 annually. Assume 35% transferred to Buckheart to handle second shift. 65% would be saved.

.65 x $150,000.00	$ 97,500.00
Total Savings	$644,215.00

2. *Double Shift Buckheart Mine.*

A full double shift operation at Buckheart to produce approximately 2,500,000 tons of River Coal will materially reduce operating costs.

Using Fiatt's unit stripping costs at a 9.26 ratio applied to a 11.57 ratio at Buckheart the stripping cost should average 71.2¢. Allowing a cost of 75¢ against Buckheart's present cost of 90¢. Saving per ton. $ .15

Preparation costs at Buckheart of 42¢ per ton are the highest studied. With the double shift operation and the added maintenance allowance from Cuba above, the cost should be reduced to about 30¢. However, allow 32¢ or a 10¢ per ton savings. .10

Haulage costs are relatively good at Buckheart but on a double shift basis with 50 ton units the cost will be reduced at least 5¢ per ton .05

With the overhead allowance from Cuba and the twice as large divisor due to increased production from double shift production, all general overhead items will be reduced at least 10¢ per ton .10

Total per ton savings $ .40

Such a savings would reduce Buckheart's present cost of $2.77 to $2.37 which is more nearly in line with Fiatt's operating cost of $2.33. Actually on a two shift basis and in spite of a heavier overburden ratio Buckheart should operate more cheaply than Fiatt, with approximately 1,000,000 tons more production.

The 40¢ a ton savings will apply on present Buckheart production of 1,117,192 tons plus the 86,000 tons of river coal from Cuba or a total of about 1,200,000 tons.

$.40 x 1,200,000 $480,000.00

3. *Shut Down Little Sister Operations.*

Of Little Sister's production, 390,000 tons of River coal will be produced at Buckheart at an estimated cost of $2.37 against present costs of $2.44 or 7¢ a ton savings.

$.07 x 390,000 $ 27,300.00

The balance or about 280,000 tons of all rail coal will be produced at Fiatt at an 11¢ lower cost.

$.11 x 280,000 $ 30,800.00

All general office administration and about 10¢ per ton of general overhead will be eliminated:

General office administration	$166,000.00	
10¢ x 668,000 general overhead	66,800.00	
		$232,800.00
Total Little Sister		$290,900.00

4. *Operate Fiatt Mine Full Capacity.*

There is little opportunity for any large savings at Fiatt. The mine now has the lowest cost in the field.

The largest single item of combined savings will be noted under "River Shipments" below.

Haulage costs are high at Fiatt using 20 and 25 ton coal haulers. The full use of a high capacity fleet will reduce costs at least 10¢ per ton. 40 ton units at Fidelity are hauling for 20¢.

$.10 x 1,500,000	$150,000.00

A benefit of 10¢ per ton will accrue on about 700,000 tons of production with the use of one of the large stripping units replacing the 750-B shovel.

$.10 x 700,000	$ 70,000.00
Total Fiatt	$220,000.00

5. *River Shipments.*

The Buckheart Mine which is scheduled to produce all Fulton County River coal reaches barges on the Illinois River at 20¢ per ton. On an explanded double shift basis this figure should improve.

Truax-Traer's River Terminal at Liverpool operates for 11¢ per ton and the rail rate to the river is 40¢ or a total of 51¢ to reach barges from either Little Sister or Fiatt.

Hence a savings of 31¢ a ton will be realized by making these shipments from Buckheart:

Little Sister	391,045 tons
Fiatt Mine	900,309
Total	1,291,345 tons

Use 30¢ savings— $.30 x 1,291,345	$387,400.00

RE-CAP FULTON COUNTY SAVINGS

1.	Shut down Cuba Mine	$ 644,215.00
2.	Double shift Buckheart Mine	480,000.00
3.	Shut down Little Sister Operations	290,900.00
4.	Operate Fiatt full capacity	22,000.00
5.	River shipments	387,400.00
		$2,022,515.00

PERRY COUNTY

The Elkville mines of Truax-Traer, Burning Star Drift (underground) and Burning Star No. 1 (strip) in Jackson County, although operating in the general vicinity of the Perry County mines, are too far distant to be considered for any economic operational savings from a merger.

The Strip mine has reserves of 6,672,149 tons, sufficient to carry it about 12 years at its present rate of production of 564,000 tons. The Drift has reserves for about 27 years.

It is, therefore, logical to consider their operation separately and assume the contribution to the merged company in proportion to the contribution to the parent company—Truax-Traer.

The Perry County mines of Truax-Traer and United Electric produced 2,245,613 tons in the 12 month period December 1, 1954 through November 30, 1955.

The coal was produced over 2 tipples and mined from 3 general operations, Fidelity, Burning Star No. 2 and Pyramid, the tipples being at Fidelity and Pyramid.

The reserves of the two companies total 54,379,389 tons with a potential of 56,000,000 tons all lying within a circle of 3 miles radius centering along the Illinois Central tracks (which divides Truax-Traer and United Electric) near William Creek.

About 30% of the reserve tonnage lies within this same circle at a 2 mile radius.

See Exhibit IV for a clearer picture of reserves and mining operations.

Pyramid Mine (Truax-Traer)

The Pyramid Mine is operating on property adjacent to the Pyramid Tipple. Pyramid has a small reserve of coal, which will be exhausted at the present rate of production in less than two years.

The Stripping unit is an 1150-B Dragline which normally will be moved to Burning Star No. 2 mine in a short time.

Burning Star No. 2 is now shipping coal to the Pyramid Tipple for preparation at about a 25¢ per ton penalty.

A prompt decision must be made as to a new tipple and tipple site to be ready to operate not later than the Fall of 1957.

Burning Star No. 2 Mine (Truax-Traer)

Burning Star No. 2 and Pyramid combined produced in the 12 month period 1,167,066 tons.

Burning Star No. 2 is presently shipping its tonnage to the Pyramid Cleaning Plant at a freight and dumping charge of 25¢ per ton. In spite of this handicap it is producing coal at a considerably less cost than the other two mines.

The mine has a coal reserve of 30,685,842 tons with a potential reserve exceeding 32,000,000 tons giving a life of over 27 years at present rates of combined production. (Pyramid and Burning Star No. 2).

Pyramid and Burning Star No. 2 are operating with a total of 17 coal trucks. A savings can be realized on a combined operation with the use of 50 ton coal haulers.

The primary stripping unit at Burning Star No. 2 is a 950-B stripping shovel.

Fidelity Mine (United Electric)

The Fidelity Mine produced 1,078,547 tons in the 12 month period (12/1/54 to 11/30/55) working 217 days.

The indicated tipple capacity is 4970 tons per shift which gives a potential annual production, working 225 days, of 1,118,250 tons.

The Fidelity Tipple is probably one of the oldest in the area but has been improved. Its present operating cost is 34¢ or 8¢ a ton higher than the Pyramid Tipple cost.

Haulage costs are good, both at Fidelity and Burning Star No. 2, when compared with Fulton County costs.

Fidelity's operating costs are 50¢ a ton higher than the combined Pyramid and Burning Star No. 2 costs.

The Fidelity Mine has a reserve tonnage of 23,693,547 tons with a potential of about 24,000,000 tons. Practically all of this reserve lies at a greater distance from the present tipple than the present haul of 3½ and 4½ miles. It takes a 5 mile radius to include all the reserves.

The stripping units at this mine are a 45 cu.yd. Shovel, a 35 cu.yd. Dragline and a recently added Wheel Excavator. Sixteen 40 ton coal trucks are used for haulage.

Perry County Conclusions

1. There is an excellent opportunity for operational savings and advantages in merged interests of Truax-Traer and United Electric in Perry County.
2. Truax-Traer is faced with an immediate decision and capital expenditures for a new tipple and tipple location.
3. Present Truax-Traer operations are substantially cheaper (50¢ per ton) in Perry County than United Electric.
4. The Fidelity Mine is faced with increasing costs due to gradually increasing haulage distances.
5. Combined production requirements can be handled comfortably through a double shift tipple of 3000 tons capacity per shift.
6. A modern tipple, streamlined for present and indicated future market requirements can prepare the coal cheaper than present tipples.
7. Haulage can be improved and shortened on a combined total reserve of over 56,000,000 tons.
8. With a reserve of this magnitude every effort must be made for economical operations, sales, administration, etc. Every fluctuation or change in either cost per ton or realization of

10¢ per ton means a change of $5,600,000.00 in value.

9. There are substantial savings to be realized from combined supervision, engineering, clerical and administration in Perry County.

Recommendations

1. Immediately engineer and plan a new tipple of about 5000 tons capacity per shift, located near the center of the combined 56,000,000 ton reserve.
2. Connect with both the Illinois Central and Missouri Pacific railroads.
3. Shut down both the Fidelity and Pyramid Tipples.
4. Move the Pyramid 1150-B to Burning Star No. 2.
5. Modernize all haulage equipment.
6. Centralize all operational functions.
7. Combine supervision, engineering, clerical and administration.
8. And, outside the scope of this report, conceive some scheme of economically reaching the river for an added outlet of production.

ESTIMATED PERRY COUNTY SAVINGS

1. *Central Modern Tipple*

A fully modern efficient plant streamlined for present day preparation demands without heat drying should produce coal for less than 20¢ per ton. Dual shifting will further reduce the cost per ton. A conservative figure would be about 18¢ per ton.

The new tipple would, therefore, save 8¢ per ton on Pyramid's cost of 26¢ and 16¢ per ton on Fidelity's cost of 34¢.

$.08 x 1,167,066	$ 93,565.00
$.16 x 1,078,547	$172,565.00

The Central Tipple will eliminate the 25¢ shiping and handling charge from Burning Star No. 2 to the Pyramid Tipple. The tonnage will include Pyramid's tonnage in about a year's time.

$.25 x 1,167,066	$321,765.00

Maintenance is running upwards of $180,000 a year at Fidelity on tipple and yard tracks, with Pyramid about the same.

A new modern tipple and yard will maintain for that figure, hence saving the full item. $180,000.00

Total Tipple $737,695.00

2. *Modernize Haulage Equipment*

The installation of 50 ton haulage units to replace the present 20 and 35 ton units at Pyramid and Burning Star will reduce haulage costs about 5¢ a ton on the present 18¢ cost. The resulting figure of 13¢ can be taken for the combined tonnage of both companies over a short haul to the new Central Tipple.

Although Fidelity is now using 40 ton units their cost is 8¢ a ton higher than at Pyramid and Burning Star No. 2. A shorter haul and modern units will correct the cost. Hense, the savings will be:

(.18-.13) $.05 x 1,167,066	$ 58,350.00
(.20-.13) $.07 x 1,078,547	$ 75,500.00
Total Haulage	$133,850.00

3. *Centralize Operating Facilities*

Central facilities and combined administration, supervision, engineering and general overhead will result in substantial savings.

A central shop and repair facilities will conservatively save $ 75,000.00

General overhead, supervision, etc., are running upwards of $175,000.00 at Fidelity and about the same at the Truax mines. 65% of one of the operations can be saved, transferring 35% of .65 x 175,000.00 $113,750.00

the expense to the combined operation.

Total Centralization $188,750.00

4. *Stripping*

There is entirely too much spread between Burning Star No. 2 stripping costs of *64¢* and Fidelity's cost at $1.01. United Electric has forecast a possible *75¢* cost at Fidelity. However, using Burning Star's unit cost at 7 to 1 ratio against a ratio of 10 to 1 at Fidelity, the cost should be about 90¢ on a comparable basis. Hence there should be at least a 11¢ savings on 1,078,547 tons $118,640.00

5. *Re-Cap Perry County Savings*

1. Central modern tipple	$ 737,695.00
2. Modernize haulage equipment	133,850.00
3. Centralize operating facilities	188,750.00
4. Stripping	118,640.00
Total Perry County	$1,178,935.00

RE-CAP FULTON AND PERRY COUNTY SAVINGS

Total Fulton County	$2,022,515.00
Total Perry County	1,178,935.00
Total Illinois Operational Savings	$3,201,450.00

PART IV

SELLING AND ADMINISTRATION

Selling

Both companies maintain sales coverage of the market areas served by Illinois coals. There is a complete duplication not only of expense but of sales effort.

Such sales efforts conscientiously and diligently pursued have an adverse effect on market prices.

Principal markets for Illinois coals are the industrial and utility demands. Supplying such customers usually runs to rather large contracts carrying a uniform shipping schedule. It is a distinct advantage to both the customer and supplier to have a large backlog of reserves as well as to have several mines able to back up shipping schedules in the event of mishap or forced shut down of any one operation.

Further, operating as separate companies, there is undoubtedly considerable sub-standard business taken in order to fill out operational tonnage volume. This has an adverse effect on realization even though operating costs may be maintained. Merged operations would eliminate to a large extent the necessity of booking such business unless economically sound.

Sales, policies, advertising and administration can all be consolidated with definite dollar savings, at the same time giving more effective and efficient service and coverage to customers.

It would be difficult without a detailed study of both companies' sales organiaztions, their outlying offices and a study of an organization chart for merged sales coverage, to more than estimate in a general way the indicated savings possible.

Administrative

Both companies maintain almost parallel administrative, financial and clerical staffs. It is safe to say that with modest additions to either organization the combined work load can be efficiently handled.

In a combination of forces the most competent talent and best practices of both companies can be used for the benefit of the merged company.

Indicated reductions and payroll savings will not all be possible promptly due to personnel of long service on or due soon for pension benefits. However, over a period of time the indicated economies will adjust.

Financial

Without question, as in previous mergers or consolidations, there will be many opportunities for tax savings, write-offs and more efficient use of funds and credit.

No attempt will be made to estimate such benefits as it is a separate study requiring full and complete information.

Estimated Savings

1. *Sales and Administration*

The United Electric's "Selling, General and Administrative Expenses" for the year ending November 30, 1955, totalled $1,020,081.00 for 3,375,529 tons of production or 30¢ per ton.

Truax-Traer's cost for the same period was $1,733,659.00 for 7,516,857 tons of production or 23¢ per ton.

The combined tonnage of the two companies was 10,892,386 tons and the combined cost was $2,753,740.00.

Allowing for about 40% or $400,000.00 of United Electric's cost to be added to the Truax cost to handle the combined tonnage, a total of $2,133,659.00 would result or 19.6¢ per ton. Use conservatively 20¢.

Present total cost	$2,753,740.00	
20¢ x 10,892,386	2,178,500.00	
Savings		$575,240.00

2. *Market Stability*

The combined sales effort and advantages will result in an increase in realization over a relatively short period.

In addition elimination of the necessity of bookkeeping sub-standard business will substantially improve realization.

Both factors will conservatively increase realization over a short period of time by at least 10¢ per ton. With a combined Illinois tonnage of over 7,300,000 tons the resultant savings will be at least $730,000.00

Total Estimated Sales, Administration and General Savings $1,305,240.00

Estimated Total Savings (Operating, Sales, Administration)

From Combined Illinois Operations	$3,201,450.00
From Combined Sales, Administration, etc.	1,305,240.00
Total	$4,506,690.00

PART V

CAPITAL EXPENDITURES

From the foregoing report, considerable operating savings are indicated from the merger being considered.

Certain capital investments will necessarily have to be made to accomplish the results forecast.

Although no detailed engineering studies have been made, it is possible to give an approximate idea of expected expenditures and it seems logical to include such an estimate at this time. It will be understood that any estimates made will be subject to correction as more definite engineering information is obtained.

Estimate of Major Expenditures Required

Fulton County

1. *Move Cuba Shovel and Wheel Excavator to Buckheart.*

The airline distance between the Cuba and Buckheart Pits is about 7 miles—allow 9 miles travel.

Most of the distance will be over jointly owned property. Little Sister haulage roads may be of great help in selecting a route and speeding up the move. The C. B. & Q. tracks and Highway 73 will be a critical crossing.

Very little additional right of way will be required. All calculations have been made separately and not included in the report. The work sheets are available if required.

	Operating Expense	Capital
Estimated cost	$ 75,000.00	
Move other required equipment	10,000.00	
(Operating Expense)	$ 85,000.00	

2. *Double Shift Buckheart Mine*

Several miles of main haulage road will be required for opening a new pit. Allow (Operating Exp.) $ 30,000.00

	Operating Expense	Capital
New main power lines will have to be established. Considerable line material and transformers can be salvaged from Cuba.		
Allow (Capital Expense)		$ 25,000.00
Present tipple capacity is indicated at 4734 tons per shift. The tipple should produce 5500 tons per shift.		
Increased capacity would be preferable over a tight operating schedule. Allow for increasing capacity (Capital Expense)		300,000.00
For an average main haul of 3 miles, 9 trucks of 50 tons capacity will just about haul 5500 tons per shift. Allow 2 trucks for maintenance and repair. 11 fifty ton coal haulers would be quite safe at about $50,000.00 each.		
Allow—$550,000.00		
Estimated salvage from 27 trucks now being used at the two mines of an average of $6,500.00 each or about:		
Credit — $175,000.00		
Net cost new fleet (Capital expense)		375,000.00
The River Dock will probably need some improvements for capacity, economy and double shift operation. Allow $50,000.00 or about the cost of extending the railroad to the Truax Dock (Capital Expense)		50,000.00

3. *Fiatt Mine*

Improve haulage equipment. Fiatt now has 6 new 45 ton caterpillar coal haulers. To haul up to 7000 tons per shift, 11 trucks will be required. Allow 2 for repair and maintenance gives a total of 13 or 7 more to be acquired.		
7 at $50,000.00 — $350,000.00		
Fiatt now has 7 — 25 ton units and 15 — 20 units. Allow salvage of —		
15 - 20 ton at $ 3,000 — $ 45,000.00 7 - 25 ton at $10,000 — 70,000.00		
$115,000.00		
Net new truck fleet (Capital Expense)		$235,000.00

	Operating Expense	Capital
Utilize Little Sister's 5561—40 cu. yd. shovel. Will require a move of either 5561 to north field or 5561 to 950-B pit and 950-B move to north field. In either case dead-head distance of about 5 miles entirely over owned property. Critical crossings are T. P. & W. Railway and Highway No. 9.		
Estimated cost of moves (Operating Expense)	$ 25,000.00	
Total Fulton County Operation, Expense	$140,000.00	
Total Fulton County Capital Expense		$985,000.00

In addition, about 8 years from now a new tipple will have to be built near the old Eagle Mine west of Canton. It will probably require $1,800,000.00 to $2,000,000.00. However, such a new tipple would be required in any event.

Perry County

Central Tipple Double Shift.

Estimated cost of a modern 5000-6000 ton per shift tipple streamlined for utility and industrial markets.		
(Capital Expense)		$1,800,000.00
About 5 to 6 miles of yard track and connecting spurs.		
(Capital Expense)		250,000.00
Centrally located shop and other facilities—salvaging from present operations.		
(Capital Expense)		150,000.00
New main line haulage roads.		
(Operating Expense)	$40,000.00	
Modernize truck fleet — 10 units at $50,000.00	$500,000.00	
Salvage—		
Fidelity 15-40 ton units at	$10,000.00	
	$150,000.00	
Pyramid & Burning Star No. 2—9-20 ton units at $3000.00	27,000.00	
7-25 ton units at 10,000.00	70,000.00	
Total Salvage	$247,000.00	

	Operating Expense	Capital
Net Total New Truck Fleet (Capital Expense)		$ 253,000.00
Move 1150-B to Burning Star No. 2. This will be done over about a 5 mile route previously used.		
Estimated Cost (Operating Expense)	$ 18,000.00	
Total Perry County Operating Expense	$ 58,000.00	
Total Perry County Capital Expense		$2,453,000.00

RE-CAP CAPITAL EXPENDITURES FULTON AND PERRY COUNTIES

Fulton County	$140,000.00	$ 985,000.00
Perry County	58,000.00	2,453,000.00
Totals	$198,000.00	$3,438,000.00

Against this figure will be salvage of the Pyramid, Fidelity and Cuba Tipples; also St. David Tipple of Little Sister in about 2 years. Such salvage will reduce the capital investment to a figure below $3,000,000.

This means that the investment will be amortized in less than one year by the estimated saving.

Set up as a depreciation, it will average less than $300,000.00 a year or approximately 6.7% of the savings forecast.

Of the above total capital expenditure, Truax-Traer would normally be required to make the following investments in any event:

Fiatt

New trucks	$ 235,000.00

Perry County

New Tipple		1,800,000.00
New trackage		150,000.00
Central Facilities		100,000.00
Truck Fleet for Single Shift		
Cost	$500,000	
Salvage	97,000	403,000.00
Total		$2,688,000.00

	Operating Expense	Capital
Hence to the merged companies the additional capital investment would be:		
Merged Capital Investment Estimated	$3,438,000.00	
Truax-Traer Investment Estimated	2,688,000.00	
Difference	$ 750,000.00	

Salvage of the three tipples would just about wipe out the difference.

	12 Months Production Tons	River Tonnage	Days Worked	Average Per Day Tons	Per Cent of Running Time 225 Days Base	Potential Tipple Capacity @ 225 Days
Fulton County						
Truax-Traer						
Fiatt Mine	1,503,850	900,309	235	6,400	104.4	1,440,000
United Electric						
Cuba Mine	751,575	86,190	194	3,875	86.2	871,875
Buckheart	1,117,192	1,089,184	236	4,734	104.9	1,065,150
Total	1,868,767					1,937,025
Little Sister						
St. David	668,319	391,045	178	3,755	79.1	844,875
Cuba						
Total Fulton County	4,040,936	2,466,728		18,764		4,221,900
Perry County						
Truax-Traer						
Burning Star #2 & Pyramid	1,167,066		192	6,080	85.0	1,367,550

1922

United Electric						
Fidelity	1,078,547		217	4,970	96.4	1,118,250
Total Perry County	2,245,613			11,050		2,485,800
Total Perry and Fulton Counties						
Truax-Traer		2,670,916				
United Electric		2,947,311				
Little Sister		668,319				
Total		6,286,549				

SUMMARY—ILLINOIS PROPERTIES AS OF NOVEMBER 30, 1955

Reserves		Potential Life @ Present Rate Prod.	Haulage Cost	Preparation Cost
Owned or Leased Tons	Potential Tons			
20,444,339	32,000,000	21 yrs.	(.28)	(.37)
7,430,910	7,500,000	10 yrs.	(.24)	(.33)
22,380,668	25,000,000	21 yrs.	(.17)	(.42)
5,353,780	5,500,000	17 yrs.		
3,500,000	6,000,000	—		
8,853,780	11,500,000			
59,109,697	76,000,000	19 yrs.		
30,685,842	32,000,000	27 yrs.	(.18)	(.26)
23,693,547	24,000,000	24 yrs.	(.20)	(.34)
54,379,389	56,000,000	25 yrs.		

EXHIBIT I

Costs						
Direct Labor	Direct Supplies	Other	Total Labor & Supplies	Depreciation & Depletion	Other Overhead	Total
$.82	$.66	$—	$1.48	$.27	$.58	$2.33
.87	.84	.27	1.98	.26	.61	2.85
.89	.87	.04	1.80	.30	.67	2.77
.91	.69	.20	1.80	.24	.40(2)	2.44(1)
.84	.68	.15	1.62	.19	.60	2.41
.89	.95	.04	1.88	.42	.61	2.91

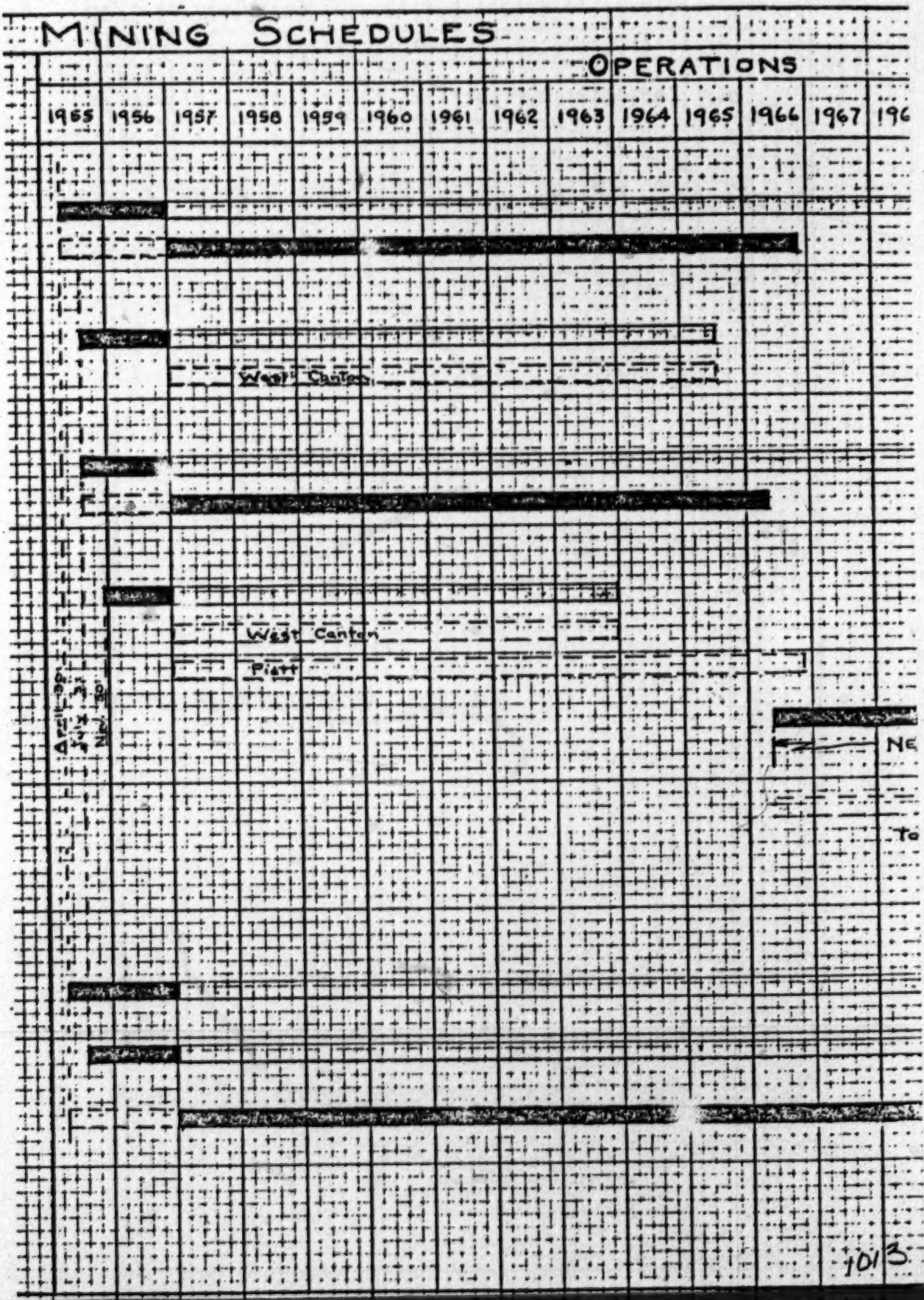
(1) Royalties (advance) of 31 cents to be added.

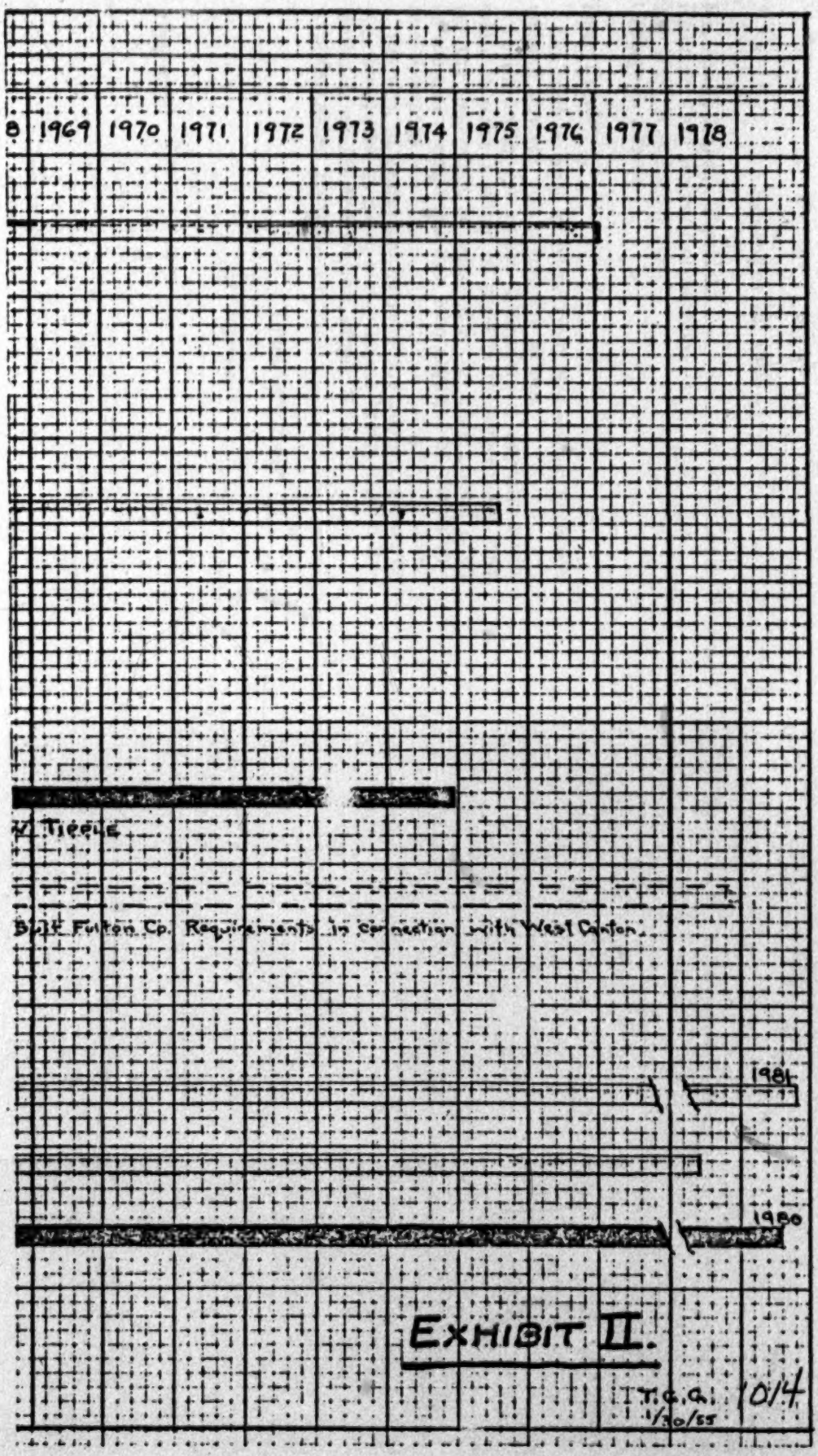
(2) Administration at Chicago 24 cents.

	PRODUCTION			
	PRESENT		PROPOSED	
	12/1/34-11/30/35	Reserves	Production	Potential Res.
FULTON COUNTY				
FIATT MINE	1,503,850	11,500,000 (21,000,000) West Canton	1,500,000	17,500,000
CUBA MINE	751,575	7,430,910	Shut Down	
BUCKHEART MINE	1,117,192	22,380,648	2,500,000	25,000,000
LITTLE SISTER ST. DAVID	668,319	5,353,780	Shut Down	
CUBA WEST CANTON (PROPOSED)			4,000,000	33,500,000
NORTH CANTON (POSSIBLE)			?	?
PERRY COUNTY				
PYRAMID AND BURNING STAR NO. 2	1,167,066	30,685,842		
FIDELITY	1,076,547	23,693,547		
CENTRAL TIPPLE (PROPOSED)			2,250,000	56,000,000

MINING SCHEDULES

OPERATIONS




8
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
W. Tioga
Bklyn Fulton Cp. Requirements in connection with West Canton.
1981
1980
EXHIBIT II.
T.C.G.
1/30/55
1014

KOLBE DEPOSITION EXHIBIT L

THE UNITED ELECTRIC COAL COMPANIES

307 North Michigan Avenue
Chicago 1, Illinois

September 12, 1960

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Frank:

Enclosed is copy of letter from Roy Miller of Alcoa which I thought you would like to see.

In line with our recent discussion, it appears worth while to make a study of possible investment and cost per ton that might be achieved in an underground mine on the coal acreage that has been acquired by the Aluminum Company.

There is, of course, no hurry about this but whenever you would like to do it, please let us know what information is needed and we will supply it.

With kindest regards,

Yours very truly,

/s/ Johnnie

JMM:EW

KOLBE DEPOSITION EXHIBIT N

October 3, 1955

Mr. R. J. Hepburn:

In regard to the North Canton Field, I have a date today with Mrs. Lillian Miller who owns 220 acres adjoining our Lynch property and her attorney and I are hopeful of winding this up fairly soon.

Three properties that we need to drill in this area are the Miller 220, Williams 231 and Houston 256 as this is where we are meeting strong competition from Ayrshire. Mrs. Williams, if she deals with anyone, will deal with us, and Don Houston, the President of the bank in Canton, is interested only in a trade and will give us an opportunity before he will Ayrshire. This will run into money and if we can keep Ayrshire from getting it I think for the time being I think we should let it remain in that state. The other properties in the vicinity are owned by Mrs. Biddie Ingersoll who at present will deal with neither of us on any portion of her 1000 acres and Mr. and Mrs. Fred Strawn, who own 320 acres that we need to drill, are about 75 years of age and will deal with no one at all but Mrs. Strawn has talked with her heirs and told them they should let us have it after they come into possession.

These tracts are in the eastern part of our North Canton Field and it is only here that we have had opposition. The west area, in which we own or control 868 acres, has had no competition. There are, however, several hundred acres that should be picked up but this will be a matter of attrition as none of the land owners want to sell at any price. We have been attempting to deal with these people for several years and it is a time consuming process. William Blakely, who is now retired and previously operated the Blakely Coal Company and was in the mining business for many years, lives on the hard road north of Canton right on the edge of the west part of our field. He is financially independent but wants some-

thing to do to occupy his time. He has done me several favors in the past out there and would like to work for us taking up options. I think this could be arranged either on a salary or a commission basis, and I believe he would be a valuable man to have. He knows every piece of coal in the county and is very well acquainted with and respected by the land owners and I would like to have you meet him and talk over the proposition. We have lost heavily in the past to competitors in Fulton County and it shouldn't happen again.

T. H. LATIMER

THL:ga

KOLBE DEPOSITION
EXHIBIT O

Kolbe Dep. Ex. O Id.

February 16, 1960

Mr. R. J. Hepburn

NORTH COLTON FIELD

During the past few weeks the following have been approached more than once.

1. Negley, Marion - Don,	NJ and S^2SJ,	Sec. - 13-7-3,	240 Ac.
2. Fingel, Carl C.,	SE,	Sec. - 11-7-3,	160 Ac.
3. Fingel, Elizabeth K.,	N^2NE,	Sec. - 14-7-3,	80 Ac.
4. Martetirn, Emma,	SW^4	Sec. - 11-7-3,	160 Ac.
5. Dodson, O.Y.,	Pt. SE Pt. NE,	Sec. - 10 & Sec. - 15-7-3	163 Ac.
6. Shelby, Floyd,	W^2	Sec. - 10-7-3	320 Ac.
7. Garrison, Roland,	W^2 SE W 50 Ac. NE,	Sec. - 12 Sec. - 13-7-3	130 Ac.
8. Dump, C.A.,	Pt. SW,	Sec. - 13-7-3	135 Ac.
9. Randolf, L.F.,	SE & Pt. SW W^4,	Sec. - 13-7-3 Sec. - 18-7-4	328 Ac.
10. Miller, Viola, Geo., & Harry,	SW N 70 Ac. NE,	Sec. - 6 Sec. - 7 Sec. - 10-7-4	390 Ac.
11. Wilson, Glenn, Trustee,	$W^2/4$ & S^2SW W^2 SE W^2 NW W^2 SW,	Sec. - 8 Sec. - 8 Sec. - 17 Sec. - 17-7-4	440 Ac.
12. Worrell, Hattie & Lee,	SE SW Pt. W^2 S^2 NE SE Pt. N^2,	Sec. - 17 Sec. - 21 Sec. - 21-7-4 Sec. - 21-8-4 Sec. - 20-8-4	494 Ac.

13. Kline, John F., Est.	E^2 NE	Sec. - 17	
	S^2 NW		
	NE SW	Sec. - 16-7-4	200 Ac.
14. Briggs, Byron,	N^2 NE	Sec. - 21-7-4	
	W^2 W^2	Sec. - 28	
	W^2 NW	Sec. - 36-8-3	318 Ac.
15. Alward, Est.,	SW & Pt. SE	Sec. - 9	
	N^2 NE	Sec. - 16-7-4	206 Ac.
16. Wolf, Floyd,	E^2	Sec. - 4-7-4	329 Ac.
17. Wolf, Warren,	SW	Sec. - 4	
	NW	Sec. - 9	
	NE	Sec. - 7	480 Ac.
18. Martin, Blanche J.,	SE SE	Sec. - 16	
	W^2 SW & Pt. S^2		
	SE SW	Sec. - 15-7-4	165 Ac.
19. Negley, Raymond,	W^2 NE, NW SE,	Sec. - 6-7-4	120 Ac.
20. Latimer, Harold,	W^2 NE	Sec. - 1-7-3	
	W^2 SE	Sec. - 36-8-3	160 Ac.
21. Negley, Ben, Est.,	NW	Sec. - 1-7-3	160 Ac.
22. Eaholman, Clyde,	W^2 NE	Sec. - 1-7-3	
	S 34 Ac. NW	Sec. - 6-7-4	
	SE	Sec. - 6-7-4	
	NE	Sec. - 36-8-3	
	S^2 NE & NE NE	Sec. - 32-8-4	
	E^2 SE	Sec. - 29-8-4	564 Ac.
23. Meyers, Fred K.,	S 3/4 SE	Sec. - 32-8-4	
	NW	Sec. - 6-7-4	268 Ac.
24. Rubin, Gus,	NE	Sec. - 36-8-4	160 Ac.
25. Jones, Ray, et al,	W 200 Ac. E^2	Sec. - 25-8-4	160 Ac.
TOTAL			6385 Ac.

As you know we have competition in all of this area, from one source, and in the north are from two. Most of these people are amenable to talking, for two reasons; they know that if they have strippable coal they are going to have to sell eventually, and to meet the price appeals during this time of low farm income.

While we have too little definite information as to the reserves in the area, there is undoubtedly enough to keep a mine going for many years to come. No. 6 coal, we know is present over much of it, and No. 5 should be present in a larger part. Depth remains to be ascertained. There are a total of about 18,000 acres in the area under discussion. Should one third contain coal at 5,000 tons per acre this would yield 30,000,000 tons, and it could be greater.

Peabody, Truax-Traer, Ayrshire, Southwestern and Midland (together), all have reserves substantially greater than ours, and reserves are extremely difficult to find now that all the major fields are gone. I have kept out of this area since Feb. 10, and if you wish me to back out completely, I will advise these people that we are no longer interested. However, I should like to go back in immediately.

W. H. Latimer

WHL:jh

KOLBE DEPOSITION
EXHIBIT 8

Patented July 27, 1943

2,325,064

UNITED STATES PATENT OFFICE

[illegible]

EXPLOSIVE COMPOSITION

Robert W. Lawrence, Wilmington, Del., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Delaware

No Drawing. Application June 22, 1940, Serial No. 341,340

8 Claims. (Cl. 52—11)

This invention relates to explosive compositions of improved power and safety and more particularly to explosive compositions containing a liquid sensitizing agent which is insensitive to impact, and to explosive compositions which do not contain liquid explosives sensitive to friction.

Explosive compositions which have been used by the prior art have normally been divided into two classes: first, sensitive explosives which contain nitroglycerin or admixtures of nitroglycerin with other nitric esters which are sensitive to impact, and explosive compositions containing no explosive constituent which is sensitive to impact. The art has found the use of nitroglycerin explosives extremely useful in blasting operations. However, for a number of operations, it is preferable to use explosives that are relatively insensitive to detonation and are completely or almost completely insensitive to impact and to friction. The insensitive explosives usually comprise an explosive salt such as ammonium nitrate in admixture with other salts such as sodium or potassium nitrate and carbonaceous materials such as wood pulp, starch, ivory meal and similar substances together with a sensitizer such as dinitrotoluene, trinitrotoluene, or other materials that are insensitive to impact. These types of explosives are used in many operations where it is especially desirable to eliminate the hazards encountered by the use of sensitive explosives.

It is an object of this invention to provide an explosive which is relatively safe to handle. A further object of this invention is to provide an explosive insensitive to impact but which may be detonated with a commercial blasting cap. A further object of this invention is to provide an explosive composition that does not contain a liquid explosive sensitive to impact or friction.

A further object of this invention is to provide an explosive composition that is relatively safe during packing operations and during the loading of bore holes. A further object of this invention is to provide an explosive which is insensitive to impact and which is cap insensitive. Another object of this invention is to provide an explosive composition that contains a liquid nitroparaffin as the sensitizing agent. Other objects will become apparent hereinafter.

In general, the objects of this invention are accomplished by compounding an explosive composition which contains an admixture of oxidizing salts, such as, for example, ammonium, sodium or potassium nitrate; with a reducing or carbonaceous material, such as, for example, wood flour, ivory meal, bran or legume, meal and the like; and a liquid nitroparaffin, such as, for example, nitromethane, nitroethane, dinitropropane, dinitropropane or other liquid nitroparaffins which has an oxygen balance not less than about —50%.

The manufacture of explosives of this invention is carried out in any of the various manners well known in the art, and may include, for example, a procedure comprising the screening into a mixer, such as a Tulley mixer, an amount of an oxidizing salt, such as sodium, potassium or ammonium nitrate, alone or in admixture with one another along with an amount of carbonaceous or reducing material, such as wood flour, bran, legume, etc. The Tulley mixer bowl contains the desired amount of a liquid nitroparaffin alone or mixed with other nitroparaffins to obtain a mixture of the desired oxygen balance and sensitivity. The Tulley mixer after the ingredients are thoroughly mixed is dumped and the explosive composition packed into casual cartridges that may be manufactured from paper, plastic or metal. The cartridges may be of any convenient diameter, but normally will have a diameter greater than about 2 inches as the type explosives of this invention are generally found most useful in quarrying rock or in large operations where the large diameter cartridges are desired.

The liquid nitroparaffins in themselves are not explosives; i. e., they will not detonate with a commercial blasting cap. However, balanced explosive compositions containing liquid nitroparaffins produce a quantity of explosive energy approaching that of explosive compositions containing the same percentage of nitroglycerin. The oxygen balance of the nitroparaffins is very low, and, therefore, care in compounding an explosive composition must be exercised so, if the oxygen balance of the final explosive composition is too low, difficulty in effecting detonation is experienced. Thus, for example, nitromethane has an oxygen balance of —39.3%; nitroethane, an oxygen balance of —69%; dinitroethane, an oxygen balance of —39.9%; and dinitropropane, an oxygen balance of —49.7%. The liquid nitroparaffins having a similar proportion of oxygen than nitroethane have such low oxygen balances that they preferably are not to be used alone in explosives, but they may find use in conjunction with the lower nitroparaffins. For example, suitable mixtures may include a solution containing two parts of nitroethane and one part of nitrobutane by weight with an oxygen

balance of —81% or a solution containing equal parts by weight of nitromethane and nitropropane with an oxygen balance of —87%. Therefore, my invention does not contemplate the use of nitroparaffins or mixtures of nitroparaffins having an oxygen balance lower than —100% alone in explosive compositions.

As a specific example of carrying out my invention, I may admix 69 parts by weight of ammonium nitrate with 29 parts by weight of nitromethane and two parts by weight of balsa pulp. The admixture after thorough incorporation is packed into cartridges, and is sensitive to detonation by a No. 6 blasting cap and is found to be a very desirable explosive. Further, the same mixture when tested by the "halved cartridge method of propagation" will cause detonation across a gap as great as 10 inches. It is believed that the nitromethane causes detonation of the composition by interreaction with the oxidizing materials, especially the ammonium nitrate. The reaction may be initiated by a blasting cap but not by an impact and thus provides for the production of a very safe but cap sensitive explosive composition. However, this theory is not to be construed as limiting this invention.

A further advantage of the above type explosive over the nitroglycerin containing explosive composition is that nitromethane does not cause the operators to develop headaches when the explosives are handled; and, further, by itself it will not freeze above —15° F. so that when a composition containing nitromethane is used in normal operations, freezing can not occur until this temperature is reached, and often will not occur until a much lower temperature is reached. If freezing of a nitromethane powder occurs, the effect is not as hazardous as the freezing of nitroglycerin powders since the explosive is much less sensitive to thawing operations. Furthermore, the freezing point can readily be lowered by addition of suitable proportions of other liquid nitroparaffins.

In order to point out the invention more specifically, the following examples are given of explosive compositions containing liquid nitroparaffins in varying proportions as the sensitizing ingredients. The compositions of a number of explosives are given in Table 1, and their various properties are listed.

Table 1

	Sample			
	A	B	C	D
Nitromethane ..... per cent	5.0	10.0	40.0	20.0
Ammonium nitrate ..... do	95.0	74.0		60.0
Sodium nitrate ..... do			48.0	
Wood flour ..... do		6.0	12.0	
Coal ..... do	4.0			
Balsa ..... do				4.0
	100.0	100.0	100.0	100.0
Oxygen balance (ingredients) ..... per cent	+4.0	−1.5	−19.2	−4.0
Count, 1¼ x 8"/250	147	150	146	118
Sensitiveness [1]	10"	9"	10"	9"
Detonation rate ..... m./sec.		3,200	3,100	3,000
Sensitiveness to impact [2] ..... cm.		7 100	7 100	7 100
Sensitiveness to rifle bullet [3]	(4)	(5)	(5)	(5)

[1] Tested on impact machine, 2 kg. falling weight; P=partial shot in steel cracking.
[2] Tested by impact of 30-06 bullet from U. S. Army rifle at 120 yards.
[3] When primed with a No. 6 blasting cap.
[4] Not tested.
[5] Did not shoot.

Other cap sensitive explosive compositions may be prepared in which the nitromethane is replaced by dinitroethane or dinitropropane.

It has been found that other explosive compositions may be prepared, with nitroparaffins, which are not sensitive to detonation by a commercial blasting cap but are sensitive to detonation by a booster charge. Thus, for example, it is possible to produce an explosive composition which furnishes a high amount of power when it detonates, but which is so insensitive that a booster, such as a half stick of 40% dynamite or a charge of dinitrotoluene or tetryl must be used to prime the composition. In general, this type of insensitive explosive composition is prepared by decreasing the percent of the nitroparaffin present or by using a nitroparaffin having a lower oxygen balance or by combining these two features.

To illustrate the type of explosive compositions which are compounded to be insensitive to detonation by a commercial blasting cap, Table 2 is given wherein the composition and properties of an extra and straight dynamite are listed.

Table 2

Sample	A	B
Nitroethane	Per cent 12.0	Per cent 20
Ammonium nitrate	74.0	
Sodium nitrate	8.0	66.5
Balsa	6.0	6.5
	100.0	100.0
Oxygen balance (ingredients)	−3.0	−6.0
Count, 1¼ x 8"/250	110	232
Sensitiveness:		
Primed with No. 6 cap	Failed	Failed
Primed with ½ stick 5×8 dynamite	Shot	Shot

To illustrate gelatin type dynamites containing nitroparaffin, Table 3 is given wherein the composition and properties of a gelatin explosive are listed.

Table 3

Sample	A
Nitromethane	Per cent 12.0
Nitroglycerin	1.20
Sodium nitrate	67.0
Wood flour	5.37
	100.0
Oxygen balance (ingredients) ..... per cent	−2.7
Count, 1¼ x 8"/250	92
Sensitiveness:	
Primed with No. 6 cap	Failed
Primed with ½ stick 5×8 dynamite	Shot
Weight strength ..... per cent	68.3

[1] Determined with ballistic mortar.

It will be understood by those skilled in the art that similar explosive compositions may be prepared by using mixtures of nitromethane with the higher nitroparaffins such as nitropropane and nitrobutane, and that the sensitiveness of such explosive compositions may be controlled by varying the composition of the nitroparaffin mixtures as, for example, by altering the nitromethane and nitroethane content.

It has been found that the explosives containing nitroparaffins such as nitromethane, nitroethane and the like are advantageous because they are highly insensitive to impact and friction and in consequence are especially adapted for packing into metal cans. These nitroparaffin explosive compositions that are cap sensitive may

be manufactured and packed with automatic machinery into a metal can without the danger which this type of operation entails when nitroglycerin containing explosive compositions which are sensitive to impact and friction are manufactured and packed with automatic machinery.

The advantages of the nitroparaffin explosives over the known explosive compositions are insensitivity to impact, lack of causing headaches, and low freezing points, while still being capable of being manufactured to any degree of cap sensitivity.

The explosives of this invention have been found to be highly desirable in all blasting operations when packed in the desired size and type containers. The preferred use, however, is in large operations such as open pit mining and quarry blasting, where the explosive compositions may be used in large diameter cartridges of metal, paper or plastic.

The term "oxygen balance" used in the specification and claims is well known and accepted by the art. The "oxygen balance" of an explosive compound is calculated by determining the total weight of the compound and dividing this weight into the difference between the weight of the oxygen required to completely oxidize the elements of the compound and the weight of the oxygen actually present in the compound.

The "halved cartridge gap method" is a standard explosive composition test and is described fully in Bulletin 348 issued by the U. S. Bureau of Mines.

It will be understood that the details and examples hereinbefore set forth are illustrative only, and that the invention as broadly described and claimed is in no way limited thereby.

What I claim and desire to protect by Letters Patent is:

1. An explosive composition comprising an oxygen deficient liquid nitroparaffin containing not more than two nitro groups and having an oxygen balance in excess of about —100% in admixture with an oxidizing salt and a carbonaceous material.

2. An explosive composition comprising an oxygen deficient liquid nitroparaffin containing not more than two nitro groups and having an oxygen balance in excess of about —100% in admixture with ammonium nitrate and a carbonaceous material.

3. An explosive composition comprising nitromethane having an oxygen balance in excess of about —100% in admixture with an oxidizing salt and a carbonaceous material.

4. An explosive composition comprising nitroethane having an oxygen balance in excess of about —100% in admixture with an oxidizing salt and a carbonaceous material.

5. An explosive composition comprising between about 5% and about 45% of nitromethane having an oxygen balance in excess of about —100% in admixture with an inorganic nitrate and a carbonaceous material.

6. An explosive composition comprising between about 15% and about 25% of nitroethane having an oxygen balance in excess of about —100% in admixture with an inorganic nitrate and a carbonaceous material.

ROBERT W. LAWRENCE.

KOLBE DEPOSITION EXHIBIT T

HERCULES POWDER COMPANY
INCORPORATED

June 27, 1956

The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Attention: Mr. Frank F. Kolbe, President

Gentlemen:

Reference is made to the license agreement of May 1, 1956, entered into by Hercules Powder Company and The United Electric Coal Companies covering Hercules' United States Letters Patent No. 2,325,064 relating to explosive compositions. Among other things, the reference license agreement provides for the payment of royalties at the rate of three-quarters of one cent ($0.0075) for each pound of explosive composition covered by the claims of the patent. You have requested that Hercules Powder Company waive the royalty payments provided for in the license agreement of May 1, 1956, in consideration of The United Electric Coal Companies making available to Hercules for its use the results of the research and development work conducted by Mr. Frank F. Kolbe with respect to the use of the explosive compositions covered by United States Letters Patent No. 2,325,064.

Hercules Powder Company hereby waives the royalty payment of three-quarters of one cent per pound of explosive composition resulting from the practice of the inventions claimed in United States Letters Patent No. 2,325,064 made and used by you, which would become due under the reference license agreement, so long as Mr. Frank F. Kolbe continues the development and experimental work in the practical application and use of explosive compositions covered by United States Letters Patent No. 2,325,064 at the facilities of The United

Electric Coal Companies, and so long as you make available to Hercules for its unlimited use written reports of such development and experimental work, and so long as you permit authorized representatives of Hercules Powder Company, at Hercules' election, to visit your plants and observe such development and experimental work. You further agree to grant and do hereby grant to Hercules an irrevocable, non-exclusive, royalty-free license, with the right to grant sublicenses without accounting to you, under any invention first conceived or reduced to practice by you in the performance of the development and experimental work contemplated by this agreement, but such license shall be limited to those inventions conceived or reduced to practice while this letter agreement is in effect.

Either party to this letter agreement may terminate the same upon ten (10) days' written notice to the other party. Upon termination of this letter agreement the waiver of royalty payments under the license agreement of May 1, 1956, as herein provided, shall terminate and all royalties provided for in the license agreement shall thereafter accrue and shall be due and payable by United Electric Coal Companies to Hercules Powder Company in accordance with the terms of that agreement.

If the foregoing conditions as to the waiver of royalty payments are acceptable to you, please indicate your acceptance thereof by signing and returning one copy of this letter to us for our files.

Very truly yours,

HERCULES POWDER COMPANY
By /s/ [Illegible]
Assistant General Manager

AGREED TO this 9th day of July, 1956.
THE UNITED ELECTRIC COAL COMPANIES

By /s/ Frank F. Kolbe
(Title)

KOLBE DEPOSITION EXHIBIT W-1

February 25, 1958

Mr. Harry La Viers, President
South-East Coal Company
Paintsville, Kentucky

Dear Harry:

We have a mining operation in West Kentucky that produces a high grade coal selling on the average for $6.25. After we get the coal uncovered, it costs us about $2.50 to transport the coal to the washing plant, wash it, pay royalties, and pay selling and administration expenses.

At our present location, we are running into deeper overburden and therefore have been considering an underground operation.

The coal averages 42 inches and has a good roof and a fair bottom. It is somewhat rolling. The high wall is in good condition.

Do you know of anyone with equipment who would care to come in and mine this coal at a price that would give him and us a profit?

Very sincerely yours,

President

Copy to: Mr. John Morris
Mr. Robert J. Hepburn

KOLBE DEPOSITION EXHIBIT W-2

SOUTH-EAST COAL COMPANY

Harry LaViers
President

Paintsville,
Kentucky

March 6, 1958

Mr. Frank F. Kolbe
United Electric Coal Company
307 North Michigan Avenue
Chicago, Illinois

Dear Frank:

This letter is in reply to yours of February 25th with reference to some possibility of underground mining on your properties in West Kentucky and to tell you that right at the moment I am sorry I can't be helpful.

I hope you are planning on coming to Boca Raton to the next meeting of the Coal Executives so that I can discuss this matter with you personally and see if I can't come up with some suggestion. If you do not attend the Florida meeting, I will be in Chicago before too long, I think, and will drop in and visit with you for a while.

Yours truly,

/s/ Harry
HARRY LAVIERS

HL:ml

KOLBE DEPOSITION EXHIBIT W-3

SOUTH-EAST COAL COMPANY

Harry LaViers
President

Paintsville,
Kentucky

April 28, 1958

Mr. Frank F. Kolbe
United Electric Coal Companies
307 North Michigan Avenue
Chicago, Illinois

Dear Frank:

In response to your inquiry of some time ago, I had hoped that I could recommend a deep mine producer here in Eastern Kentucky to help you with your problem in West Kentucky. The fellow I had in mind has made some other plans, and I am afraid that I do not have a prospect in view whom I could afford to recommend to you.

However, the situation up this way is changing rather rapidly, and if I run across someone I think is desirable, I will advise you.

Yours truly,

/s/ Harry
HARRY LAVIERS

HL:ml

KOLBE DEPOSITION EXHIBIT X

December 3, 1957

Memorandum to: Mr. Robert J. Hepburn

In reply to your memorandum of November 29 regarding deep coal in southern Illinois, I think for the present we can employ our money better other places.

President

KOLBE DEPOSITION EXHIBIT X-1

November 29, 1957

Mr. F. F. Kolbe:

I am attaching copy of a letter from Tom and a map showing the deep coal that was brought to our attention by Bill McCulloch of Roberts & Schaefer.

If I am informed correctly, I would estimate that this No. 6 coal would run around 3% sulphur. However, the ash and Btu should be better than our DuQuoin coal. Of course this does not compare with the 1% ash that Old Ben have under control. It may be that if we would not be interested in deep coal of this type we might be able to offer it to the aluminum company.

I would appreciate your advising me what you think of deep coal of this type.

/s/ R. J. Hepburn
R. J. HEPBURN

RJH:J
Attach.

KOLBE DEPOSITION EXHIBIT X-2

November 25th
1957

Mr. R. J. Hepburn

Bill McCulloch was in the office this morning discussing the 4 blocks of coal he is trying to dispose of in Franklin County. These consist of the following:

Block #1, 2194.45 acres owned by Franklin County Mining Company in north and east of Benton. This should contain at least 14,000,000 tons of recoverable #6 coal, running from 7′ to 8′ in thickness at a depth of about 600′. It may be that the fact that some of this is under the City, the reserve will have to be cut considerably. This coal is adjoined on the west by the holdings of Old Ben and on the south by the Freeman Coal Company. The entire eastern boundary adjoins the U. S. Steel Company holdings. While the territory to the West is open, and the holdings could be extended, the majority of the reserve could be mined by Old Ben. Their mine #14 probably is within 2 miles of the western edge. About 2,800,000 tons could be mined from a new opening of the Freeman Coal Company, which is about 1¾ miles from the southern edge. The field is served by the C. & E.I., Mopac and the Eldorado branch of the I. C. At the closest point, Big Muddy River is about 2 miles away.

Block #2 consists of something over 1100 acres or 7,700,000 tons of recoverable #6 coal about 700′ deep and lies west of Blocks 3 and 4. This is bound on the north by Freeman, on the west by Peabody's abandoned mine #18, which still has some reserve, and on the south Old Ben's mine #9, whose location is probably between 2 and 3 miles away. The Eldorado branch of the I. C. cuts through this area. It is 7 miles away from the Big Muddy.

Block #3 consists of 660 acres of scattered holdings of the Burr Oak Coal Company, which lies between blocks 2 and 4.

Block #4 consists of 5,025 acres or probably 35,000,000 tons of recoverable #6 coal from 6′10″ to 8′7″ thick at

a depth of 700', owned by Franklin County Coal Corporation. This is on the Edgewood cutoff of the I. C. and close to the Eldorado branch. It is about 15 miles from the Big Muddy.

I pointed out above that Block #1 could be valuable to Old Ben and Freeman, but Blocks 2, 3 & 4, if filled in by the acquisition of coal owned locally by individuals, would contain approximately 12,620 acres or at least 88,340,000 tons of recoverable #6 coal, as there is approximately 153,000,000 tons in place. In addition, scattered drilling shows the presence of #5 coal 4' to 5' in thickness or approximately 78,600,000 tons in place, of which about 47,000,000 tons should be recoverable.

The coal north in Block #4 is owned by the U. S. Steel Corporation, but the other three sides are open as far as I can tell except for the scattered Burr Oak holdings.

Blocks #1 and #4, as stated above, are owned by the Franklin County Coal Corporation. Ira Westbrook, attorney, is a Trustee and is handling the affairs.

Black Star, which has Block #2, is owned by Roy Carter, who is President of the Company.

Burr Oak is handled by Louis Francour of Francour & Company, investment bankers.

Newton Luarco with the Carter Harrison interests, represents the bond holders of the Franklin County Coal Corporation, and I believe, is Secretary of Burr Oak.

Olin Mathison is a minority stock holder of Burr Oak, that acquired this as a liquidated debt some years ago.

There is some oil production on the Burr Oak and Franklin County properties, but as far as the coal is concerned, the three organizations have agreed to sell as a package. McCulloch has been offerred a commission for handling this, but we are at liberty to talk with the principals at any time. Bill has made no concerted effort to sell this, but has discussed it all over the coal field. He has offerred it to U. S. Steel and as far as I can tell, his price was $50.00 per acre. He would not give me a firm price, but insinuated that $50.00 would take it. He does not know whether or not all cash would be required. This would take $446,000 at the $50.00 price. He tells

me that certain operators have scoffed at this figure. Of course, the acreage to be purchased from individuals is not figured in the price of $446,000.

A map showing the area is attached.

/s/ T. H. L.
T. H. LATIMER

THL/ah

KOLBE DEPOSITION EXHIBIT Y

November 7, 1955

Mr. R. J. Hepburn:

I think it best to put down in writing some of our problems in order that we can discuss them intelligently at a later date.

Years ago we had a fairly good Engineering Department. We handled the acquisition of all reserves, the prospect drilling, mapping, building of railroads, bridges, haulage roads, projection of the pits, monthly surveys and reports, planned all drainage work, saw to it that all obstacles to our stripping were removed, kept up not only the topographic but the maps of the various plant areas showing all changes in railroad tracks, pipe lines, power lines, hoppers, etc., analyzed the efficiency of the shovels as well as preparing a shovel report, did the same with the drills, and in general formed a base on which the mines operated. This deteriorated throughout the years from lack of direction and inadequate help.

We now have only two engineers in the field. In Fulton County we have Riley who can be used to good advantage if handled properly. He is capable and willing and I think is learning that the Superintendent is boss. Inman when he arrives will help a great deal. The set-up is not too good regardless of who is there and the engineer continues operating entirely out of the Canton Office.

Cuba is an easy problem in that the present pit will be extended for the life of the mine. We have no new fields to enter as the remaining coal is in a solid block. We will acquire no more property from individuals and once our mapping is completed little engineering work will be required unless major changes are made. It would be wasteful to have an engineer at the mine constantly as long as the mine is under its present set-up.

Buckheart has been in a state of flux ever since it started. It has been a high production mine since 1938. It is a difficult field in that the coal is and has been in many

divided areas. There is much more property to be acquired and the plans for mining in the remaining acreage must be completed and this is a major job. A good engineer really should have his headquarters at the mine and he should be much more than a transitman. He can make himself the most valuable man at the mine next to the Superintendent if he will. There are no facilities for an engineering office there and it should be near the Superintendent. As long as an engineer is in the Canton Office rather than at the mine he will not be used nearly as much as though he was right underfoot.

Mine No. 19 requires little engineering work outside the mine other than transit work and 40 or 50 acres of topography that must be done when our crop line drilling is a little more complete. Donaldson is an engineer himself and does more engineering work than he wants anyone to know about.

Mine No. 25 requires little work at the moment.

At Mine No. 11 we have one man who has some value but is an architect rather than an engineer and as far as I can determine has no particular ambition or desire for responsibility. This is a difficult position to fill and should be held by a man with considerable force. A confident engineer could make himself more valuable here than any mine I know but with our present help we are limited to roughly measuring yardage, shooting in blast holes, making monthly surveys and a few miscellaneous odd constructions jobs and running errands. Holloway is fairly good on structural work and has been a help there.

Our Office Engineer can do beautiful drafting work for reports, etc., but little or no experience in stripping or with any of the problems at the mines, and is not too much inclined to get along well with others. The monthly reports and annual reserve reports are prepared here and there is considerable room for improvement in this line. However, our engineers in the field have been lax in the past in submitting full information with their surveys but I believe this will be corrected.

As to myself, because of lack of help I am neglecting more work than I am doing and have for some time. Traveling alone taken up far too much time. In the past twenty-one months I have driven 77,000 miles at an average of 50 miles per hours. This figures out to 64 days of 24 hours each, or over 10% of the time. This does not include a substantial amount of plane and train travel. This is caused principally by having too many irons in the fire with insufficient help and it means that everything necessary cannot be done. Frankly I would be lost without too much work but the way it is handled at present is not very fair to the Company.

We had until about two years ago a Land Man in Fulton County who kept in touch with everything going on. He was never replaced. I think that Inman can be broken in on this to a considerable extent but, of course, he cannot spend full time at it. We need a local man who either knows or can know everyone and every piece of property in the coal bearing area. Most of our competitors keep someone in each locality where property is to be acquired, either on a salary or a commission basis. On one job in Kentucky Sinclair had such a man for a scout, then when they wanted to acquire the property selected, they brought in 21 oil scouts from Oklahoma and took up the field in two or three days. This was at a time when they had competition in the area.

We have during the years examined something over 200 coal fields. Of those we have taken up, either wholly or partially, only seven. Some of the best were dropped without going into. Some of them taken perhaps not too wisely. The constant search for and investigation of new properties should go on but someone should be broken in to help with this. While there is a report in the files on everything we have ever looked at, it is not necessarily complete as it is not practical to get complete information in a day. It takes someone with the ability to go up with a topographic map, note the outcrops and prepare a rough estimate, as well as dealing with the landowners or promoters. A great deal of the information on topography, coal seams, operations, the various

promoters, prices of land, etc., can hardly be put down on paper. Someone else should be trained to know what he is looking for when he goes into a prospective coal field.

Practically all of our competitors have a far better organization for prospecting than we. Ayrshire, for instance, has at least six drills generally in operation and all under the supervision of a Drilling Superintendent. They also have an engineer following up on the drills at all times so that the surveys of locations, elevations, etc., are always up-to-date. I have seen Sinclair prospect a field with eleven drills while probably that many more were in other fields. While these eleven drills were working the Drilling Superintendent was pushing them and there were several engineering parties in the field. They were able to have their complete estimates in a very short time. Incidentally, this was in a field we turned down for certain reasons but has made a profitable operation for them.

I would like to discuss the entire problem at length with you, either here at the office or some place where we can have plenty of time to go over it thoroughly as I am afraid we are not building up properly the basis on which our future lies.

T. H. LATIMER

THL:ga

KURTZ DEPOSITION
EXHIBIT 8

STEAM-ELECTRIC PLANT FACTORS

1968 EDITION

(Fuel Consumption and Costs, Plant Capacity, Net Generation, 1967, and Planned Capacity, 1968-1974.)

AN ANNUAL STUDY BY THE
DIVISION OF ECONOMICS
AND STATISTICS

Eighteenth Edition, October 1968
Copyright, National Coal Association, 1968

NATIONAL COAL ASSOCIATION
1130 Seventeenth St., N.W.
Washington, D. C. 20036

Price $5.00
Foreign Mailings $6.00

* * *

Table 1. Steam-Electric Plant Capacity, Net Generation, Fuel Consumption, and Unit Costs, 1967

Line No.	City	Company	Plant	Installed Generating Capacity (Thous. Kw)*	Net Generation (Million Kwh)*	Fuel Designed For: C-Coal, S-Stoker, P-Pul'v'd, O-Oil, G-Gas	Coal: Tons (Thous.)	Coal: Cost per Ton F.o.b. Plant	Coal: Tons Burned	Coal: BTU per Lb.	Oil: Barrels (Thous.)	Oil: Cost per Barrel F.o.b. Plant	Oil: Cost per Barrel As Burned	Oil: BTU per Gallon	Gas: Million Cubic Feet	Gas: Cost as Burned (¢/MCF)	Gas: BTU per Cubic Foot	Cost per Million BTU (cents): F.o.b. Plant*	Cost per Million BTU (cents): As Burned: Coal	Oil	Gas	Percent of Consumption in B.T.U.: Coal	Oil	Gas	Line No.
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
MIDDLE ATLANTIC - Cont'd																									
PENNSYLVANIA - Cont'd																									
23	Scranton	Pennsylvania Power & Light Co.	Suburban 11	29.3	111.9	C(P)	70 20	$4.33																	23
24	Sunbury	"	Sunbury	409.8	2,626.1	C(P)	1,389	5.17	$4.64	11,144	1	$4.45	$4.32	137,738	-	-	-	19.4	20.8	74.7	-	100	-	-	24
25	Shelocta	"	Keystone 21	936.0	1,779.1	C(P)	645 21	4.34	5.12	11,617	8	4.26	4.34	138,133	-	-	-	22.3	22.0	74.8	-	100	-	-	25
26	W.Norristown	Philadelphia Electric Company	Barbadoes	180.0	657.7	C(P)OG	246	8.20	4.44	12,106	21	4.95	4.97	138,800	-	-	-	17.9	18.3	85.3	-	99	1	-	26
27	Chester	"	Chester	256.0	975.9	C(SP)OG	64	8.20	8.75	13,447	97	2.03	2.07	149,191	1,088	30.5	981	30.5	32.5	33.0	31.1	80	7	13	27
									9.26	13,461	1,869	1.90	1.91	150,142	56	29.6	978	30.5	34.4	30.2	30.3	13	87	-	
28	E.Pikeland	"	Cromby	417.5	2,508.4	C(P)O	879	8.21	8.46	13,511	4	4.20	4.80	143,716	-	-	-	30.4	31.3	79.5	-	100	-	-	28
29	Philadelphia	"	Delaware	499.3	2,213.4	C(SP)O	752	8.22	8.52	13,394	746	2.14	2.15	149,568	-	-	-	30.7	31.8	34.2	-	81	19	-	29
30	Eddystone	"	Eddystone	707.2	4,908.6	C(P)O	1,591	8.23	8.37	13,471	56	2.53	2.58	146,469	-	-	-	30.5	31.1	42.0	-	99	1	-	30
31	Philadelphia	"	Richmond	474.8	1,943.9	C(SP)O	487	8.21	8.58	13,410	1,936	2.18	2.19	149,502	-	-	-	30.6	32.0	34.9	-	52	48	-	31
32	Philadelphia	"	Schuylkill	325.4	1,929.7	C(SP)O	-	-	-	-	3,158	2.02	2.03	153,012	-	-	-	-	-	31.6	-	-	100	-	32
33	Philadelphia	"	Southwark	345.0	1,598.1	C(P)O	735	8.24	8.51	13,453	11	4.87	4.98	139,045	-	-	-	30.6	31.6	85.3	-	100	-	-	33
34	Peach Bottom	"	Peach Bottom	12e	12e	12e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
35	Hunlock Creek	United Gas Improvement Company	Hunlock	93.0	415.9	C(SP)	307	3.39	4.11	9,675	-	-	-	-	-	-	-	18.6	21.2	-	-	100	-	-	35
36	Reesedale	West Penn Power Company	Armstrong	326.4	2,730.0	C(P)	1,181 8	3.81	3.83 8	11,540	-	-	-	-	-	-	-	16.5	16.6 8	-	-	100	-	-	36
37	Milesburg	"	Milesburg	46.0	301.8	C(P)	177 8	3.54	3.53 8	10,800	-	-	-	-	-	-	-	16.4	16.3 8	-	-	100	-	-	37
38	Courtney	"	Mitchell	448.7	3,102.3	C(P)	1,295 8	4.57	4.69 8	12,560	-	-	-	-	-	-	-	18.2	18.7 8	-	-	100	-	-	38
39	Springdale	"	Springdale	422.1	1,954.1	C(SP)	1,076 8	3.95	4.23 8	11,050	-	-	-	-	-	-	-	17.9	19.1 8	-	-	100	-	-	39
40	Chambersburg	Chambersburg Electric Dept.	Chambersburg 2	19.1	74.9	C(P)G	33	na	na	13,000 7	2	na	na	140,000 7	500	na	1,040 7	na	na	na	na	62	1	37	40
41	Lansdale	Lansdale Electric Department	Lansdale 7	25.5	67.9	C(SP)	42	na	na	13,800 7	-	-	-	-	-	-	-	na	na	-	-	100	-	-	41
42	Quakertown	Quakertown Electric Department	Quakertown	6.0	20.2	C(S)	18	na	na	13,750 7	-	-	-	-	-	-	-	na	36.1	na	na	100	-	-	42
		TOTAL PENNSYLVANIA		11,014.6	59,660.6		24,675	5.70	5.85	12,266	8,072	2.10	2.11	150,741	1,644	30.5	999	23.3	23.8	33.3	31.1	92	8	-	
		TOTAL PHILADELPHIA CITY AREA (LINES 26-34)		3,205.2	16,735.7		4,754	8.22	8.49	13,456	7,897	2.05	2.06	151,020	1,144	30.5	981	30.5	31.5	32.5	31.1	71	28	1	
		TOTAL PENNSYLVANIA STATE (EXCLUDING PHILADELPHIA)		7,809.4	42,924.9		19,921	5.10	5.21	11,983	175	4.43	4.43	138,136	500	na	1,040	21.3	21.8	76.2	na	100	-	-	
EAST NORTH CENTRAL																									
ILLINOIS																									
1	Bartonville	Central Illinois Light Company	E. D. Edwards	125.0	899.9	C(P)	418	4.81	4.92	10,651	-	-	-	-	-	-	-	22.6	23.1	-	-	100	-	-	1
2	Peoria	"	Liberty Street	25.0	11.9	C(S)	9 22	5.47	5.71	10,434	-	-	-	-	-	-	-	26.2	27.4	-	-	100	-	-	2
3	E. Peoria	"	E. S. Wallace	301.4	1,345.1	C(P)G	728	5.04	5.14	10,716	1	na	na	150,000 4	165	na	1,000 7	23.6	24.0	na	na	99	-	1	3
4	Montgomery Co.	Central Illinois Public Service Co.	Coffeen	330.0	2,156.6	C(P) 3	1,066	3.50	3.52	9,982	2	4.61	4.83	136,282	-	-	-	17.5	17.6	84.4	-	100	-	-	4
5	Grand Tower	"	Grand Tower	216.0	1,024.5	C(S)	499	4.73	4.88	11,152	6	4.27	4.45	137,682	-	-	-	21.2	21.9	77.0	-	100	-	-	5
6	Hutsonville	"	Hutsonville	200.0	1,105.2	C(P)	513	5.19	5.34	11,401	7	3.96	4.22	137,548	-	-	-	22.8	23.4	73.0	-	100	-	-	6
7	Meredosia	"	Meredosia	325.0	1,742.4	C(P)	825	5.14	5.26	10,589	16	4.30	4.35	137,263	-	-	-	24.3	24.8	75.5	-	99	1	-	7
8	Chicago	Commonwealth Edison Company	Calumet	234.5	485.6	C(SP)OG 3	241 8	6.01	6.85	10,104	-	-	-	-	1,864	26.9	1,046	29.7	33.9	-	25.7	71	-	29	8
9	Chicago	"	Crawford	701.5	3,769.7	C(SP)G	1,539 8	5.58	5.79	10,325	-	-	-	-	5,378	27.8	1,046	27.0	28.0	-	26.6	85	-	15	9
10	Dixon	"	Dixon	119.0	464.4	C(P)G	169 8	6.22	6.80	10,209	-	-	-	-	1,961	28.6	1,043	30.5	33.3	-	27.5	63	-	37	10
11	Morris	"	Dresden	12f	12f	12f	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
12	Chicago	"	Fisk	601.6	2,483.0	C(P)OG 3	1,175 8	5.39	6.02	10,066	-	-	-	-	2,388	26.9	1,044	27.8	29.9	-	25.7	90	-	10	12
13	Joliet	"	Joliet	1,862.4	9,252.8	C(P)OG 3	4,243 8	4.73	4.85	10,735	-	-	-	-	-	-	-	22.0	22.6	-	-	100	-	-	13
14	Chicago	"	Northwest	223.8	232.5	C(SP)O	170 8	5.95	6.78	10,502	-	-	-	-	-	-	-	28.3	32.3	-	-	100	-	-	14
15	Pekin	"	Powerton	320.0	779.7	C(P)O	554 8	5.10	5.30	9,894	-	-	-	-	-	-	-	25.8	26.8	-	-	100	-	-	15
16	Stickney	"	Ridgeland	690.0	3,162.8	CG 3	1,208 8	5.57	5.79	10,114	-	-	-	-	9,362	29.6	1,043	27.5	28.6	-	28.4	71	-	29	16
17	Waukegan	"	Waukegan	1,042.8	4,822.1	C(SP)OG 3	1,945 8	5.47	5.63	10,827	11	3.99	3.99	138,343	5,814	28.3	1,042	25.3	26.0	68.7	27.2	87	-	13	17
18	Lockport Twp.	"	Will County	1,268.9	6,229.2	C(P) 3	2,918 8	5.58	5.70	10,321	-	-	-	-	-	-	-	27.0	27.6	-	-	100	-	-	18
19	Rockford	"	Fordam	75.3	187.0	C(SP)OG	55 8	7.40	7.64	11,380	-	-	-	-	1,960	22.5	1,056	32.5	36.0 5	-	21.3	38	-	62	19
20	Rockford	"	Sabrooke	146.4	854.1	C(P)G	178 8	7.41	8.18	11,384	-	-	-	-	5,221	21.9	1,056	32.5	33.6 5	-	20.7	42	-	58	20
21	Kincaid	"	Kincaid 10	659.7	2,070.8	C(P)	1,093 8	3.72	3.81	9,840	-	-	-	-	-	-	-	18.9	19.4	-	-	100	-	-	21
22	Joppa	Electric Energy, Incorporated	Joppa	1,100.3	8,243.5	C(P)	3,548 8	4.24	4.30	11,383	-	-	-	-	-	-	-	18.6	18.9	-	-	100	-	-	22
23	Havana	Illinois Power Company	Havana	230.0	587.0	C	366	4.88	4.96	10,127	3	4.11	4.14	140,000	-	-	-	24.1	24.4	70.4	-	100	-	-	23
24	Hennepin	"	Hennepin	306.3	1,644.8	C	654	5.30	5.38	11,015	0.4	3.87	3.92	140,000	1,632	23.1	1,052	24.1	24.3	66.7	22.0	89	-	11	24
25	Oakwood	"	Vermilion	182.3	989.8	C	483	5.05	5.12	10,811	0.9	4.37	4.38	140,000	-	-	-	23.4	23.7	75.3 5	-	100	-	-	25
26	Wood River	"	Wood River	650.1	3,750.0	CG	1,682	4.21	4.26	11,113	4	4.33	4.13	140,000	197	26.0	1,044	18.9	19.2	70.3	25.0	100	-	-	26

Table 1. Steam-Electric Plant Capacity, Net Generation, Fuel Consumption, and Unit Costs, 1967

CITY	COMPANY	PLANT	INSTALLED GENERATING CAPACITY (Thous. Kw)*	NET GENERATION (Million Kwh)*	FUEL BURNED FOR: C-COAL S-STOKER P-PULV'D. O-OIL G-GAS	COAL		COAL		OIL			GAS			COST PER MILLION BTU (CENTS)				PERCENT OF CONSUMPTION IN B.T.U.			LINE NO.
						TONS (Thous.)	COST PER TON F.O.B. PLANT	"PER" AS BURNED	BTU PER LB.	BARRELS (Thous.)	COST PER BARREL F.O.B. PLANT	COST PER BARREL AS BURNED	BTU PER GALLON	MILLION CUBIC FEET	COST AS BURNED (¢/MCF)	BTU PER CUBIC FOOT	F.O.B. PLANT*	AS BURNED						
																	COAL	COAL	OIL	GAS	COAL	OIL	GAS	
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
W NORTH CENTRAL - Cont'd																								
ILLINOIS - Cont'd																								
Savanna	Interstate Power Company	Savanna 2	10.5	3.5	C(SP)OG	3	$ na	$ na	10,697 4	-	$ -	$ -	-	32	na	1,050 4	na	na	-	na	66	- 34		27
Moline	Iowa-Illinois Gas & Electric Co.	Moline	99.1	339.5	C(S)OG	23	5.55	6.46	10,651	2	4.53	4.53	137,255	3,817	29.2	1,055	26.1	30.4	78.5	27.6	11	- 89		28
Monsanto	Union Electric Company	Cahokia	300.0	357.4	C(P)O	233	4.76	5.21	11,828	136	2.81	2.82	151,958	-	-	-	20.1	22.0	44.2	-	86	14 -		29
Venice	"	Venice No. 1	55.0	4.6	OG	-	-	-	-	2	4.10	3.93	152,000	83	23.6	1,043	-	-	61.5	22.6	-	13 87		30
Venice	"	Venice No. 2	500.0	2,102.8	C(P)G	1,028	4.65	4.92	11,358	-	-	-	-	3,135 23	23.8	1,044	20.5	21.7	-	22.8	88	- 12		31
Fairfield	Fairfield Mun. Light & Power Plant	Fairfield 7	12.5	30.8	C	33	na	na	10,697 4	-	-	-	-	-	-	-	na	na	-	-	100	- -		32
Highland	Highland Electric Light Plant	Highland 2 6	14.6	27.1	C(S)	25	na	na	10,350 7	-	-	-	-	-	-	-	na	21.4	-	-	100	- -		33
Mount Carmel	Mount Carmel Public Utility	Mount Carmel	20.5	76.9	C(S)	32	5.32	5.53	11,728	-	-	-	-	-	-	-	22.7	23.6	-	-	100	- -		34
Peru	Peru, City of	Peru 6 7	15.3	32.7	C(S)	25	na	na	12,730 7	-	-	-	-	-	-	-	na	na	-	-	100	- -		35
Princeton	Princeton Municipal Utilities	Princeton 2 6	2.8	8.0	C(S)G	-	-	-	-	-	-	-	-	150 8	na	1,030 7	-	-	-	na	-	-100		36
Rochelle	Rochelle Municipal Utilities	Rochelle 2 6	12.7	36.8	CG	22	na	na	10,697 4	-	-	-	-	690	na	1,050 4	na	na	-	na	39	- 61		37
Springfield	Springfield Water, Lt. & Pwr. Dept.	Lakeside 6	146.0	541.1	C(P) 3	343	5.33	5.33	10,663	-	-	-	-	-	-	-	25.0	25.0	-	-	100	- -		38
Winnetka	Winnetka, Village of	Winnetka 6 7	25.3	55.5	C(S)	24	na	na	12,000 7	-	-	-	-	350	na	1,058 7	na	na	-	na	61	- 39		39
Marion	Southern Illinois Power Coop.	Marion	99.0	280.8	C 3	155	4.01	4.01	11,574	0.3	4.33	4.33	137,243	-	-	-	17.3	17.3	75.1	-	100	- -		40
	TOTAL ILLINOIS		13,250.8	62,211.9		28,245	4.92	5.07	10,697	192	3.21	3.23	148,089	44,309	26.9	1,047	23.0	23.7	51.9	25.7	93	- 7		
INDIANA																								
Ind.-Ill.Line	Commonwealth Edison Co. of Ind., Inc.	State Line	972.0	5,356.1	C(P)G 3	1,977 8	4.98 8	5.26 8	11,227	-	-	-	-	8,637	24.7	1,047	22.2 8	23.4 8	-	23.6	83	- 17		1
Madison	Indiana-Kentucky Electric Corp.	Clifty Creek	1,303.6	8,865.2	C(P)	3,753	4.19	4.19	10,964	4	na	na	150,000 4	-	-	-	19.1	19.1	na	-	100	- -		2
Sullivan	Indiana & Michigan Electric Co.	Breed	450.0	2,726.6	C(P) 3	1,079	4.42	4.43	11,254	2	4.18	4.25	137,146	-	-	-	19.6	19.7	73.9	-	100	- -		3
Lawrenceburg	"	Tanners Creek	1,098.0	5,747.5	C(P) 3	2,280	4.58	4.61	11,392	30	4.18	4.15	135,500	-	-	-	20.1	20.2	73.0	-	100	- -		4
Michigan	"	Twin Branch	396.0	1,239.5	C(SP)	649	6.68	6.65	10,903	10	3.97	3.91	137,457	-	-	-	30.6	30.5	67.7	-	100	- -		5
Indianapolis	Indianapolis Power & Light Co.	E. W. Stout	383.8	1,761.8	C(SP)O	821	5.54	5.64	11,562	-	-	-	-	-	-	-	24.0	24.4	-	-	100	- -		6
Indianapolis	"	Perry K & W	59.1	74.8	C(SP)O	51	"	"	11,133	-	-	-	-	-	-	-	24.0	26.0	-	-	100	- -		7
Centerton	"	H. T. Pritchard	396.4	1,745.1	C(P)O	869		"	11,084	-	-	-	-	-	-	-	22.9	23.3	-	-	100	- -		8
Petersburg	"	Petersburg 10	261.7	983.4	C(P)O	418	3.72	3.74	10,984	-	-	-	-	-	-	-	16.9	17.0	-	-	100	- -		9
Dune Acres	Northern Indiana Pub. Service Co.	Bailly	194.0	1,268.9	CG 3	446	5.56	5.83	11,245	-	-	-	-	2,412	25.9	1,000	24.7	25.9	-	25.9	81	- 19		10
Michigan City	"	Michigan City	215.0	623.5	C(P) 3	289	6.08	6.55	10,753	-	-	-	-	1,450	30.2	1,000	28.3	30.5	-	30.2	81	- 19		11
Gary	"	D. H. Mitchell	414.3	2,976.7	C(P)	1,213	5.59	5.82	11,128	-	-	-	-	2,011	25.5	1,000	25.1	26.2	-	25.5	93	- 7		12
Hegpanee	"	Hegpanee 2	12.3	23.6	C(S)	21	na	na	11,134 4	-	-	-	-	-	-	-	na	39.5	-	-	100	- -		13
Terre Haute	Public Service Co. of Ind., Inc.	Dresser	221.0	371.8	C(SP)	240	4.59	4.79	10,885	24	na	3.98	140,000	-	-	-	21.1	22.0	67.7	-	97	3 -		14
Edwardsport	"	Edwardsport	133.0	561.6	C(P)	341	4.39	4.52	10,947	13	na	4.06	140,000	-	-	-	20.1	20.7	69.0	-	99	1 -		15
New Albany	"	Gallagher	600.0	3,794.9	C(P)	1,748	4.36	4.49	11,183	10	na	4.04	140,000	-	-	-	19.6	20.2	68.7	-	100	- -		16
Noblesville	"	Noblesville	100.0	112.1	C(P)	65	6.49	6.65	11,690	3	na	4.12	140,000	-	-	-	27.8	28.5	70.0	-	99	1 -		17
Terre Haute	"	Wabash River	521.0	3,247.0	C(P)	1,498	4.36	4.63	10,983	10	na	4.06	140,000	-	-	-	19.8	20.2	69.1	-	100	- -		18
Newburg	Southern Indiana Gas & Elec. Co.	Culley	135.7	823.8	C(P)	425	3.90	3.90	10,697	-	-	-	-	-	-	-	18.2	18.3	-	-	100	- -		19
Evansville	"	Ohio River	112.5	419.8	C(SP)	282	3.64	3.64	10,762	-	-	-	-	-	-	-	16.9	16.5 5	-	-	100	- -		20
Anderson	Anderson Municipal Light & Power	Anderson	19.0	-	C(S)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- -		21
Crawf'dsv'le	Crawfordsville Elec.Lt.& Power Co.	Crawfordsville	40.2	113.8	C(S)	78	5.99	5.99	11,725	-	-	-	-	-	-	-	25.5	25.5	-	-	100	- -		22
Fort Wayne	Fort Wayne Light & Power Works	Lawton Park	47.5	153.9	C(S)	98	8.38	8.38	12,060	-	-	-	-	-	-	-	34.7	34.7	-	-	100	- -		23
Frankfort	Frankfort Light & Power Plant	Frankfort	36.0	96.0	C(S)	67	6.75	6.75	11,000	-	-	-	-	-	-	-	30.7	30.7	-	-	100	- -		24
Huntingburg	Huntingburg Mun. Lt. & Water Plt.	Huntingburg 7	6.8	13.6	C(S)	18	na	na	11,700 7	-	-	-	-	-	-	-	na	na	-	-	100	- -		25
Jasper	Jasper Municipal Electric Utility	Jasper	9.5	39.9	C(S)	41	4.72	4.72	12,000	-	-	-	-	-	-	-	19.7	19.7	-	-	100	- -		26
Logansport	Logansport Municipal Utilities	Logansport	57.3	111.0	C(S)	59	7.82	8.02	12,500	-	-	-	-	-	-	-	31.3	30.4 5	-	-	100	- -		27
Peru	Peru Electric Light & Power Dept.	Peru	40.0	88.9	C(P)	51	na	7.34	11,600	-	-	-	-	-	-	-	na	31.9	-	-	100	- -		28
Richmond	Richmond Mun. Power & Light Dept.	Johnson Street	30.0	71.1	C(S)	52	6.58	6.56	11,598	-	-	-	-	-	-	-	28.4	28.3	-	-	100	- -		29
Richmond	"	Whitewater Valley	30.0	220.8	C(S)	118	8.40	6.38	11,255	-	-	-	-	-	-	-	28.4	28.4	-	-	100	- -		30
Rushville	Rushville City Utilities	Rushville 7	8.3	19.5	C(S)	19	na	na	11,134 4	-	-	-	-	-	-	-	na	na	-	-	100	- -		31
Washington	Washington Light & Power	Washington 7	18.0	58.2	C	34	na	na	12,000 7	-	-	-	-	-	-	-	na	na	-	-	100	- -		32
	TOTAL INDIANA		8,320.0	43,710.4		19,120	4.76	4.86	11,134	106	4.13	4.06	138,769	14,510	25.6	1,028	21.4	21.8	69.8	24.9	97	- 3		

* * *

	Plant	Type of Reactor	Installed Capacity (thous. kw)	Net Generation (million kwhr)	Kind of Fuel Used
12	Haddam #1	Pressurized water	600.0	524.1*	Enriched uranium
	*Consists mainly of test generation during late 1967. Plant was placed in commercial operation in December, 1968.				
12a	Rowe	Pressurized water	185.0	1,272.8	Enriched uranium
12b	Indian Point	Pressurized water	275.0	1,622.0*	Enriched uranium
	*Includes kwh generated by oil. (Plant is designed for production of electric energy by both nuclear and conventional fuels.) Used 228,307.66 grams of uranium at 27.767¢ per million Btu and 863,788 bbl of oil at 149,112 Btu per gal., $2.04 per bbl and 32.7¢ per million Btu "as burned."				
12c	Shippingport	Pressurized water	100.0	455.6	Natural and enriched uranium
12d	Saxton Nuclear	na	10.0	6.9*	na
	*Generation by Saxton (non-nuclear) plant from steam supplied from small nuclear reactor adjacent to plant and owned by Saxton Nuclear Experimental Corp.				
12e	Peach Bottom #1	High temp., helium cooled, graphite mod.	46.0	144.2	Uranium
	Plant used 12,394 grams of uranium at 29.7 cents per million Btu.				
12f	Dresden	Boiling water	208.7	807.0	Enriched uranium
12g	Big Rock	Boiling water, high power density	75.0	502.0	Uranium dioxide
	Plant used 67,157 grams of U235.				

(Footnotes continued on next page)

* * *

1653

Table 4. Capacity of New Conventional Steam-Electric Generating Plants or Units Planned or Under Construction, 1968-74

CITY	COMPANY	PLANT	N - NEW E - EXISTING PLANT	1968		SCHEDULED YEAR OF COMPLETION AND KILOWATT CAPACITY OF NEW UNITS								
						1969		1970		1971		1972	1973	1974
				NAMEPLATE 1/	DEPEND 2/	NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	CAPACITY 3/	CAPACITY 3/	CAPACITY 3/
NEW ENGLAND														
CONNECTICUT														
1. Montville	Connecticut Light & Power Company	Montville No. 6	E	-	-	-	-	-	-	400,000	400,000	-	-	-
2. Bridgeport	United Illuminating Company	Bridgeport Harbor No. 3	E	374,540	388,153	-	-	-	-	-	-	-	-	-
TOTAL CONNECTICUT				374,540	388,153	-	-	-	-	400,000	400,000	-	-	-
MAINE														
1. Caribou	Maine Public Service Company	Caribou No. 3	E	-	-	-	-	-	-	33,000 7/	33,000 7/	-	-	-
TOTAL MAINE				-	-	-	-	-	-	33,000	33,000	-	-	-
MASSACHUSETTS														
1. Sandwich	New England Gas & Electric Assn.	Canal No. 1	N	515,000	560,000	-	-	-	-	-	-	-	-	-
2. Salem	New England Power Co.	Salem Harbor No. 4	E	-	-	-	-	-	-	-	-	450,000	-	-
3. Somerset	"	Brayton Point No. 3	E	-	-	595,000	630,000	-	-	-	-	-	-	-
TOTAL MASSACHUSETTS				515,000	560,000	595,000	630,000	-	-	-	-	450,000	-	-
NEW HAMPSHIRE														
1. Bow	Public Service Company of N.H.	Merrimack No. 2	E	345,600	331,000	-	-	-	-	-	-	-	-	-
TOTAL NEW HAMPSHIRE				345,600	331,000	-	-	-	-	-	-	-	-	-
MIDDLE ATLANTIC														
NEW JERSEY														
1. Jersey City	Public Service Elec. & Gas Company	Hudson No. 2	E	620,000	620,000	-	-	-	-	-	-	-	-	-
2. Vineland	Vineland, City of	Municipal No. 10	E	-	-	25,000	25,000	-	-	-	-	-	-	-
TOTAL NEW JERSEY				620,000	620,000	25,000	25,000	-	-	-	-	-	-	-
NEW YORK														
1. New York	Consolidated Edison Co. of New York	Arthur Kill No. 3	E	535,500	515,000	-	-	-	-	-	-	-	-	-
2. New York	"	59th Street	E	35,000	35,000	-	-	-	-	-	-	-	-	-
3. Jamestown	Jamestown, City of	S. A. Carlson No. 6	E	25,000	25,000	-	-	-	-	-	-	-	-	-
4. Northport	Long Island Lighting Company	Northport No. 2	N	387,090	380,000	-	-	-	-	-	-	-	-	-
5. Tompkins Cove	Orange & Rockland Utilities, Inc.	Lovett No. 5	E	-	-	195,000	195,500	-	-	-	-	-	-	-
TOTAL NEW YORK				982,590	955,000	195,000	195,500	-	-	-	-	-	-	-
PENNSYLVANIA														
1. Springdale	Duquesne Light Company	Cheswick No. 1	N	-	-	-	-	565,250	570,000	-	-	-	-	-
2. Homer City	Pennsylvania Electric Co.	Homer City No. 1 & 2	N	-	-	609,000	640,000	609,000	640,000	-	-	-	-	-
3. York Haven	Pennsylvania Power & Light Co.	Brunner Island No. 3	E	790,000	765,000	-	-	-	-	-	-	-	-	-
4. Indiana County	"	Conemaugh No. 1 & 2 4/	N	-	-	-	-	841,200	900,000	841,200	900,000	-	-	-
5. Armstrong County	"	Keystone No. 2	E	865,000	900,000	-	-	-	-	-	-	-	-	-
6. Montour County	"	Strawberry Ridge	N	-	-	-	-	-	-	-	-	765,000	-	-
7. Near Masontown	West Penn Power Company	Hatf'lds Ferry No. 1, 2&3	N	-	-	500,000	540,000	500,000	540,000	-	-	540,000	-	-
TOTAL PENNSYLVANIA				1,655,000	1,665,000	1,109,000	1,180,000	2,515,450	2,650,000	841,200	900,000	1,305,000	-	-
EAST NORTH CENTRAL														
ILLINOIS														
1. Bartonville	Central Illinois Light Co.	E. D. Edwards No. 2 & 3	E	281,000	281,000	-	-	-	-	-	-	300,000	-	-
2. Coffeen	Central Illinois Public Service Co.	Coffeen No. 2	E	-	-	-	-	-	-	-	-	400,000	-	-
3. Kincaid	Commonwealth Edison Co.	Kincaid No. 2	N	560,000	600,000	-	-	-	-	-	-	-	-	-
4. Baldwin	Illinois Power Co.	Baldwin No. 1 & 2	N	-	-	-	-	623,050	600,000	-	-	-	600,000	-
5. Springfield	Springfield Water, Lt. & Power Dept.	Lakeside No. 8	E	80,000	80,000	-	-	-	-	-	-	-	-	-
6. Venice	Union Electric Co.	Venice No. 1	E	-	-	-	-	-	-	-	-	600,000	-	-
7. Venice	"	Venice No. 2	E	-	-	-	-	-	-	-	-	-	600,000	-
TOTAL ILLINOIS				921,000	961,000	-	-	623,050	600,000	-	-	1,300,000	1,200,000	-

Table 4. Capacity of New Conventional Steam-Electric Generating Plants or Units Planned or Under Construction, 1968-74

CITY	COMPANY	PLANT	N - NEW E - EXISTING PLANT	SCHEDULED YEAR OF COMPLETION AND KILOWATT CAPACITY OF NEW UNITS								
				1968		1969		1970		1971		1972	1973	1974
				NAMEPLATE 1/	DEPEND[illegible] 2/	NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	CAPACITY 3/	CAPACITY 3/	CAPACITY 3/
EAST NORTH CENTRAL - Cont'd														
INDIANA														
1. Petersburg	Indiana Statewide Rural Elec. Coop.	Petersburg No. 1 & 2	N	233,000	233,000	-	-	116,000	116,000	-	-	-	-	-
2. Indianapolis	Indianapolis Power & Light Co.	"	N	-	-	-	-	-	-	-	-	-	-	-
3. Petersburg	"	Petersburg No. 2	N	-	-	420,000	450,000	-	-	-	-	-	450,000	-
4. Jasper	Jasper Municipal Electric Utility	Jasper	E	13,200	13,200	-	-	-	-	-	-	-	450,000	-
5. Dune Acres	Northern Indiana Public Serv. Co.	Bailley No. 8	E	413,500	350,000	-	-	-	-	-	-	-	-	-
6. Hammond	"	Mitchell No. 11	E	-	-	-	-	115,100	115,200	-	-	-	-	-
7. Vermillion County	Public Service Co. of Indiana	Cayuga No. 1	N	-	-	-	-	500,000	500,000	-	-	-	-	-
8. Terre Haute	"	Wabash River No. 6	E	318,000	356,000	-	-	-	-	-	-	-	-	-
9. Lafayette	Purdue University	Lafayette.	N	7,500 3/	7,500	-	-	-	-	-	-	-	-	-
10. Yankee Town	Southern Indiana Gas & Electric Co.	Warrick No. 4 3/	E	-	-	-	-	300,000	150,000	-	-	-	-	-
11. South Bend	University of Notre Dame	South Bend	N	-	-	5,000 3/	5,000	-	-	-	-	-	-	-
TOTAL INDIANA				985,200	959,700	425,000	455,000	1,031,100	881,200	-	-	-	900,000	-
MICHIGAN														
1. Harbor Beach	Detroit Edison Co.	Harbor Beach No. 1	N	100,000	100,000	-	-	-	-	-	-	-	-	-
2. Monroe	"	Monroe No. 1 & 2	N	-	-	-	-	750,000	790,000	750,000	790,000	-	-	-
3. Port Huron	"	Port Huron	N	3,750	2,000	-	-	-	-	-	-	-	-	-
4. East China Twp.	"	St. Clair No. 7	E	500,000	500,000	-	-	-	-	-	-	-	-	-
5. Trenton	"	Trenton Channel No. 9	E	500,000	519,000 6/	-	-	-	-	-	-	-	-	-
6. Wyandotte	"	Wyandotte-North 9	E	12,500	12,000 6/	-	-	-	-	-	-	-	-	-
7. Holland	Holland Board of Public Works	J.de Young No. 5	E	30,000	30,000	-	-	-	-	-	-	-	-	-
8. Lansing	Lansing Board of Water & Light	D. C. Eckert No. 5 & 6	E	-	-	-	-	80,000	74,000	-	-	-	-	-
9. Boyne City	Northern Michigan Electric Coop., Inc.	Advance No. 3	E	22,000	22,000	-	-	-	-	-	-	-	-	-
10. Traverse City	Traverse City Light & Power Dept.	Traverse City	E	16,500	16,500	-	-	-	-	-	-	-	-	-
TOTAL MICHIGAN				1,184,750	1,201,500	-	-	830,000	864,000	750,000	790,000	-	-	-
OHIO														
1. Aberdeen	Cincinnati Gas & Electric Co.	J. M. Stuart No. 1, 2 & 3	N	-	-	11,000	11,000	610,000	580,000	610,000	580,000	580,000	-	-
2. New Richmond	"	W. C. Beckjord No. 6	E	434,000	440,000	-	-	-	-	-	-	-	-	-
3. Cleveland	Cleveland Dept. of Public Utilities	Lake Road No. 11	E	75,000	75,000 6/	-	-	-	-	-	-	-	-	-
4. Avon Lake	Cleveland Electric Illuminating Co.	Avon Lake No. 9	E	-	-	-	-	625,000	625,000	-	-	-	-	-
5. Cleveland	"	Eastlake	E	-	-	-	-	-	-	-	-	625,000	-	-
6. Dover	Dover Electric Light & Power	Dover	E	22,000 3/	22,000	-	-	-	-	-	-	-	-	-
7. Napoleon	Napoleon Municipal Utilities	Napoleon	E	12,500	12,500	-	-	-	-	-	-	-	-	-
8. Norwalk	Norwalk Municipal Light Plant	Norwalk	E	18,328 3/	18,328	-	-	-	-	-	-	-	-	-
9. Stratton	Ohio Edison Company	W.H. Sammis No. 5, 6 & 7	E	940,500	925,000	-	-	-	-	623,000	600,000	-	-	-
10. Beverly	Ohio Power Company	Muskingum River No. 5	E	590,000	615,000	-	-	-	-	-	-	-	-	-
11. Oregon	Toledo Edison Company	Bay Shore No. 4	E	217,600	213,000	-	-	-	-	-	-	-	-	-
TOTAL OHIO				2,309,928	2,320,828	11,000	11,000	1,235,000	1,205,000	1,233,000	1,180,000	1,205,000	-	-
WISCONSIN														
1. Genoa	Dairyland Power Cooperative	Genoa	E	-	-	325,000	325,000	-	-	-	-	-	-	-
2. Marshfield	Marshfield Electric & Water Dept.	Wildwood No. 5	E	20,000	20,000	-	-	-	-	-	-	-	-	-
3. Oak Creek	Wisconsin Electric Power Company	South Oak Creek No. 8	E	41,000	41,000	-	-	-	-	-	-	-	-	-
4. Milwaukee	"	Valley No. 1 & 2	N	140,000	140,000	140,000	140,000 8/	-	-	-	-	-	-	-
5. Sheboygan	Wisconsin Power & Light Co.	Edgewater No. 4	E	-	-	330,000	330,000	-	-	-	-	-	-	-
TOTAL WISCONSIN				201,000	201,000	795,000	795,000	-	-	-	-	-	-	-
WEST NORTH CENTRAL														
IOWA														
1. Ames	Ames, City of	Ames No. 7	E	35,000	35,000	-	-	-	-	-	-	-	-	-
2. Clinton	Interstate Power Company	M. L. Kapp No. 2	E	-	-	-	-	-	-	-	-	216,000	-	-
3. Cedar Rapids	Iowa Electric Light & Power Co.	Prairie Creek No. 4	E	130,000	140,000	-	-	-	-	-	-	-	-	-
4. Sioux City	Iowa Public Service Co.	Neal No. 2	E	-	-	-	-	-	-	-	-	325,000	-	-
5. Burlington	Iowa Southern Utilities Co.	Burlington No. 1	N	211,950	200,000	12,000 9/	12,000	-	-	-	-	-	-	-
6. Ames	Iowa State University	Ames, Iowa	N	-	-	81,000 9/	81,000	-	-	-	-	-	-	-
7. Muscatine	Muscatine Municipal Elec. Plant	Muscatine No. 8	E	-	-	-	-	-	-	-	-	-	-	-
TOTAL IOWA				376,950	375,000	93,000	93,000	-	-	-	-	541,000	-	-

* * *

KURTZ DEPOSITION EXHIBIT 9

BITUMINOUS COAL FACTS 1966

• • • •

The transportation revolution is not limited to the carriers of bulk coal. Another comparatively new development is the mine-mouth generating station that uses a coal-by-wire technique. A single huge generating station, built almost atop a coal mine, can serve several utility systems through extra-high-voltage transmission line interconnections.

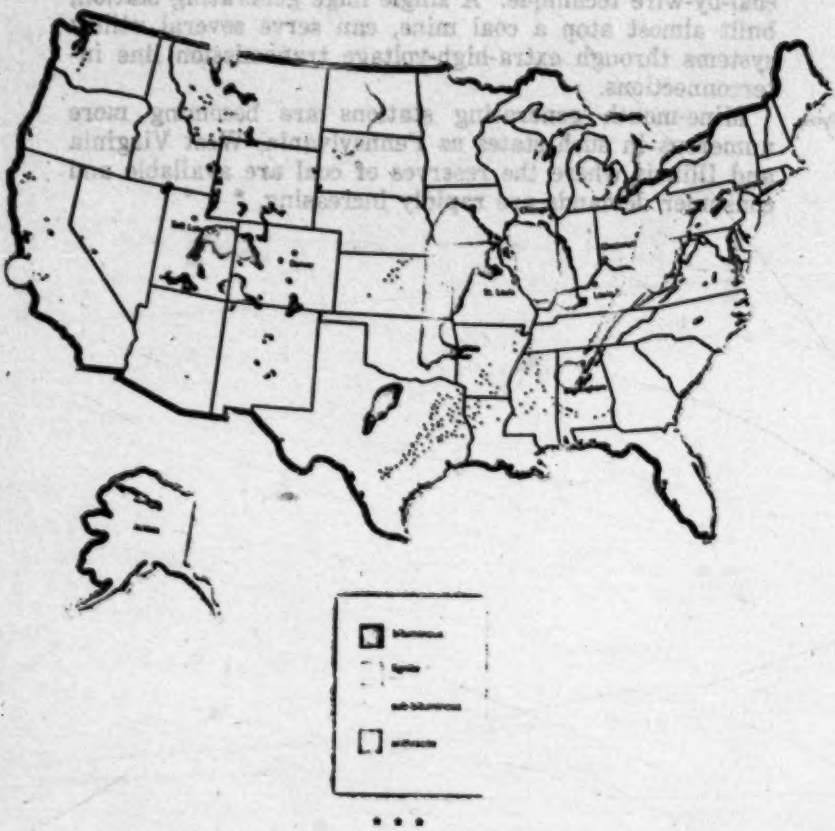
Mine-mouth generating stations are becoming more numerous in such states as Pennsylvania, West Virginia and Illinois where the reserves of coal are available and consumer demands are rapidly increasing. • • •

Kurtz Deposition Exhibit 10

Bituminous Coal Facts 1968

* * *

Coal-producing areas in the United States

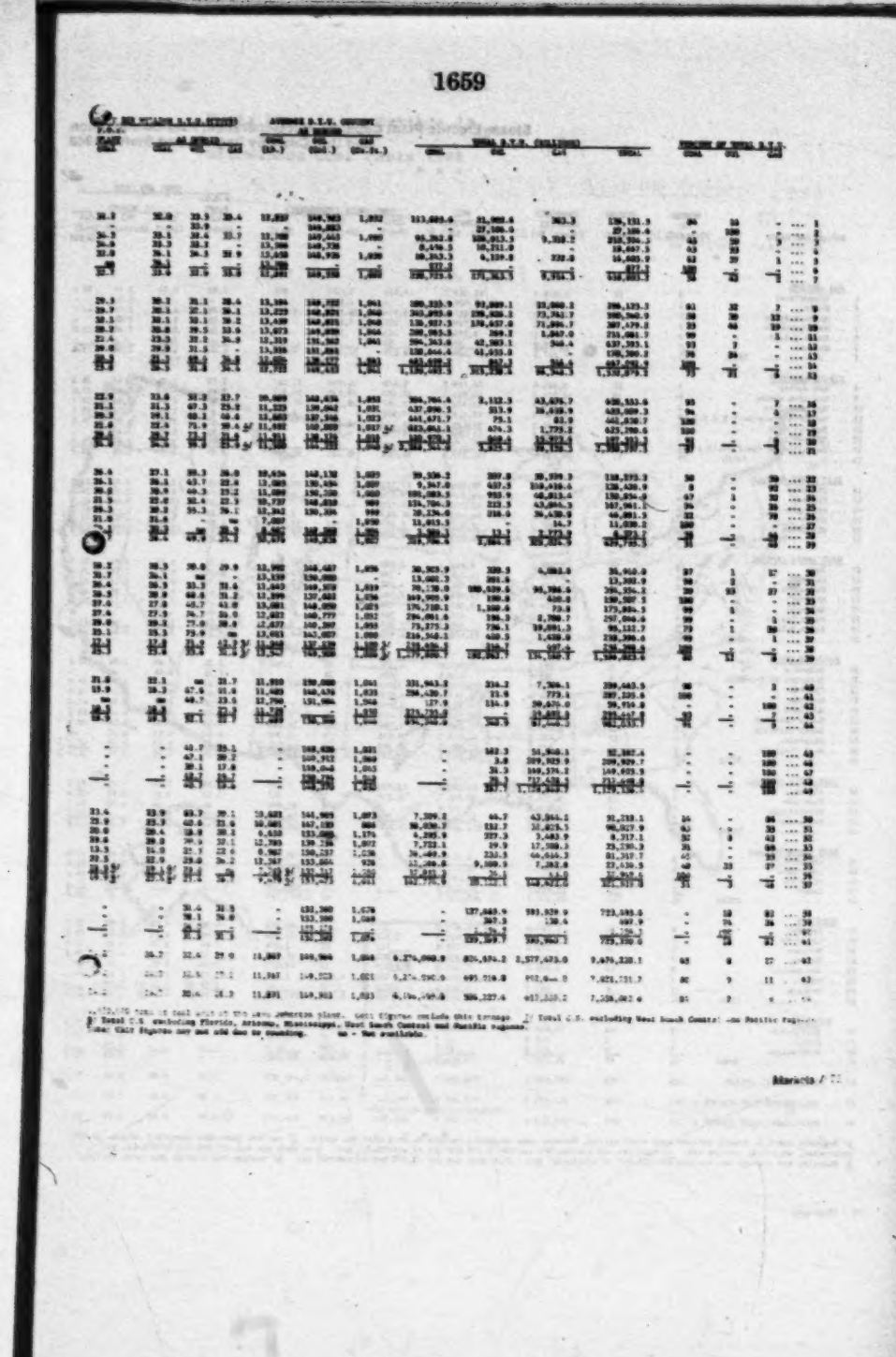


* * *

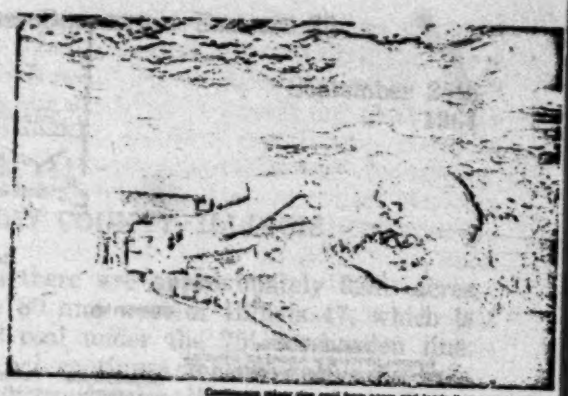
Steam-Electric Plant Capacity, Net Generation, Fuel Consumption and Unit Costs by Regions and States, 1956

Region and State	Number of Companies 1/	Number of Plants	Installed Capacity (Thous. Kw) 1/	Net Generation (Mil. Kwh) 1/	Fuel Units Consumed: Coal (Tons)	Oil (Barrels)	Gas (Mcf)	F.P.C. Plant Cost (Mills)	Cost per Unit: All Fuels (Mills)	Coal (Dollars)	Oil (Cents)	Gas (Cents)
NEW ENGLAND												
1 ... Connecticut	3	12	2,339.5	10,363.1/	4,439	2,637	382	0.42	0.34	2.31	16.4	
2 ... Maine	3	4	439.6	2,488.8	-	1,588	-	-	-	2.13	-	
3 ... Massachusetts	13	39	5,793.1	19,717.3	3,725	14,898	9,351	0.78	0.58	2.65	33.7	
4 ... New Hampshire	2	9	307.2	1,728.3	331	1,418	-	0.39	0.32	2.52	-	
5 ... Rhode Island	3	4	363.1	1,984.8	373	988	116	0.40	0.32	2.18	33.9	
6 ... Vermont	1	1	30.8	92.8	-	-	-	0.46	0.42	2.10	-	
7 ..... TOTAL	25	69	9,273.3	37,365.1	8,868	21,529	9,849	0.54	0.42	2.36	33.5	
MIDDLE ATLANTIC												
8 ... New Jersey	3	18	3,991.6	20,799.8	6,836	14,916	21,387	7.39	7.07	1.94	29.3	
9 ... New York State	6	43	12,971.5	54,554.0	13,974	28,035	70,877	7.89	7.37	2.08	27.9	
10 ... New York City	2	9	4,889.3	23,776.1	5,867	28,127	69,187	8.43	8.04	2.02	27.7	
11 ... New York State(Excl.N.Y.C.)	4	34	8,082.2	31,177.9	7,991	63	1,779	8.43	8.04	2.02	27.7	
12 ... Pennsylvania	13	64	16,888.1	57,429.7	24,134	6,477	325	7.38	7.04	2.02	30.1	
13 ... Philadelphia	1	4	3,588.2	16,888.5	4,739	4,531	-	8.32	8.04	2.08	30.1	
14 ... Pennsylvania (Excl.Phila.)	12	60	13,299.9	40,541.2	19,395	1,946	325	7.03	6.69	2.01	-	
15 ..... TOTAL	27	127	37,849.6	156,560.1	50,711	50,552	93,768	7.69	7.36	2.02	28.3	
EAST NORTH CENTRAL												
16 ... Illinois	12	30	13,982.2	59,990.1	27,350	239	41,585	6.89	6.60	2.21	25.0	
17 ... Indiana	12	32	9,982.2	43,344.9	19,588	28	14,122	6.54	6.24	2.22	28.6	
18 ... Michigan	11	29	7,981.3	42,331.2	17,332	13	82	7.39	7.20	2.04	47.7	
19 ... Ohio	23	54	11,819.7	60,038.0	28,845	8	2,772 2/	5.32	5.13	2.13	31.2	
20 ... Wisconsin	11	29	3,988.8	16,947.7	7,555	8	2,772 2/	6.12	5.88	2.11	31.2	
21 ..... TOTAL	69	174	47,754.2	222,651.9	100,670	296	61,561	6.42	6.17	2.14	29.4	
WEST NORTH CENTRAL												
22 ... Iowa	10	28	3,182.8	9,843.3	3,880	22	37,588	5.58	5.35	2.44	30.3	
23 ... Kansas	10	25	2,833.5	11,716.8	386	72	117,332	6.32	6.21	2.76	23.0	
24 ... Minnesota	21	38	3,671.6	12,916.7	4,538	122	48,215	6.58	6.38	2.11	25.3	
25 ... Missouri	18	38	5,881.7	14,980.2	5,897	24	43,562	4.68	4.71	2.26	23.2	
26 ... Nebraska	12	18	1,799.7	4,182.1	912	34	34,448	7.17	7.39	2.19	25.1	
27 ... North Dakota	4	14	384.0	1,530.6	798	-	24	8.96	8.80	-	-	
28 ... South Dakota	4	14	457.4	1,558.7	1,000	-	24	8.96	8.80	-	-	
29 ..... TOTAL	41	175	18,210.7	56,728.4	16,411	252	281,193	6.32	6.11	2.18	24.2	
SOUTH ATLANTIC												
30 ... Delaware	2	3	725.3	3,382.6	1,174	10	3,942	7.33	7.40	2.24	30.9	
31 ... District of Columbia	1	2	333.8	916.3	484	22	-	6.35	6.88	-	-	
32 ... Florida	13	37	2,348.3	13,631.8	3,012	30,888	93,895	6.13	6.57	2.09	33.2	
33 ... Georgia	3	11	3,097.4	14,789.1	6,884	13	189	7.01	7.09	2.07	33.0	
34 ... Maryland	3	11	2,496.0	17,321.3	6,838	179	71	7.18	7.37	2.02	41.0	
35 ... North Carolina	7	17	3,391.0	20,779.4	11,467	20	2,411	7.01	7.08	2.01	29.5	
36 ... South Carolina	4	11	1,665.3	9,863.3	2,969	111	12,088	7.35	7.40	2.10	28.4	
37 ... Virginia	5	13	4,441.5	21,543.9	8,322	78	1,305	6.34	6.43	2.18	-	
38 ... West Virginia	4	16	4,161.8	23,483.3	10,000	36,300	131,901	6.34	6.43	2.18	36.2	
39 ..... TOTAL	42	120	24,664.4	126,715.0	51,150	36,300	131,901	6.34	6.43	2.18	36.2	
EAST SOUTH CENTRAL												
40 ... Alabama	4	11	3,631.9	14,930.7	13,935	-	7,888	3.19	3.25	-	32.6	
41 ... Kentucky	7	15	3,735.0	19,868.7	12,537	8	747	3.63	3.72	3.98	32.4	
42 ... Mississippi	3	11	1,219.8	5,282.9	3	12	57,074	-	-	3.98	32.4	
43 ... Tennessee	5	14	4,211.1	21,220.2	12,540	20	67,335	3.63	3.72	3.98	31.7	
44 ..... TOTAL	19	51	12,797.8	61,302.5	38,253	40	67,335	3.63	3.72	3.98	32.4	
WEST SOUTH CENTRAL												
45 ... Arkansas	2	6	1,037.7	4,733.4	-	36	32,291	-	-	2.61	25.6	
46 ... Louisiana	9	30	4,881.3	19,721.9	-	1	106,434	-	-	2.96	21.4	
47 ... Oklahoma	7	19	3,573.3	13,497.5	-	1	142,363	-	-	1.88	18.6	
48 ... Texas	18	73	15,616.7	57,155.6	-	1	409,288	-	-	1.88	18.6	
49 ..... TOTAL	36	128	25,109.0	95,108.4	-	39	690,376	-	-	1.88	18.6	
MOUNTAIN												
50 ... Arizona	4	11	1,832.8	6,873.9	345	4	48,840	4.98	3.97	4.99	32.3	
51 ... Colorado	9	27	1,647.6	7,831.1	2,717	21	35,913	4.89	4.98	5.32	29.9	
52 ... Montana	3	4	139.9	632.9	323	22	2,976	3.66	3.71	5.19	22.6	
53 ... Nevada	1	4	318.5	2,362.7	302	3	56,330	7.57	7.79	4.13	29.0	
54 ... New Mexico	9	14	1,709.0	7,389.0	2,026	37	43,973	2.63	2.35	3.61	23.4	
55 ... Utah	3	10	343.7	2,461.6	660	1,919	7,863	5.45	5.75	5.42	24.1	
56 ... Wyoming	3	6	1,111.6	4,541.4	1,511	1,006	1,000	3.65	3.75	5.42	24.1	
57 ..... TOTAL	32	76	7,103.1	32,092.6	7,884	3,012	197,095	4.89	4.98	5.32	29.9	
PACIFIC												
58 ... California	8	46	15,848.7	74,784.9	-	19,951	333,892	-	-	2.01	33.9	
59 ... Oregon	2	2	111.6	13.5	-	57	122	-	-	2.43	33.1	
60 ... Washington	2	2	177.3	13.5	-	57	122	-	-	2.43	33.1	
61 ..... TOTAL	12	50	16,137.7	74,811.9	-	20,008	334,015	-	-	2.01	33.9	
62 ... TOTAL UNITED STATES	303	910	193,488.2	939,036.7	284,347	130,931	2,445,977	5.76	5.48	2.84	25.1	
63 ... COAL-COMPETITIVE STATES 3/ 342		716	152,336.0	748,080.6	264,347	130,672	838,744	5.76	5.58	2.85	27.-	
64 ... OIL-COMPETITIVE STATES 4/ 320		487	140,333.1	742,278.9	263,963	80,629	644,829	5.76	5.58	2.83	29.5	

1/ Regional and U.S. totals include some duplications, because some companies operate in more than one state. 2/ Maximum generator nameplate rating. 3/ Net generation, excluding station use. 4/ Quantity and average Btu include 2,709,000 Mcf of artificial gas. Cost data are for 473,000 Mcf of natural gas. 5/ Quantity and average Btu include 837,000 Mcf of artificial gas. Cost data are for 35,000 Mcf of natural gas. 6/ Tonnage and average Btu value include



1/ Total U.S. excluding Florida, Arizona, Mississippi, West South Central and Pacific regions.
2/ Total U.S. excluding West South Central and Pacific regions.
Note: Slight figures may not add due to rounding. NA - Not available.



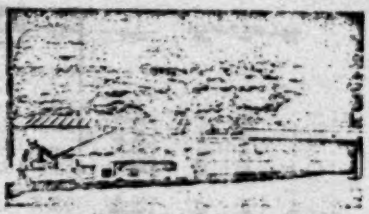
Continuous miner rips coal from seam and loads it on mine conveyor.

Production of Bituminous Coal, by States, 1939-1967—All Types of Mines

(Thousands of Net Tons)

	Maximum Production		Production by Years										Total from earliest record to end of 1965
	Quantity		1939	1947	1960	1961	1962	1963	1964	1965	1966	1967	
Alabama	1926	21,001	12,047	19,048	13,011	12,915	12,980	12,260	14,435	14,832	14,219	15,380	1,006,585
Arkansas	1907	2,670	1,152	1,871	429	385	256	221	212	225	236	245	100,450
Colorado	1917	12,483	5,923	6,358	3,837	3,679	3,379	3,600	4,355	4,790	5,222	5,425	340,659
Illinois	1918	89,291	46,783	67,860	45,077	45,246	48,487	51,736	55,023	58,483	63,571	65,200	4,039,673
Indiana	1913	35,679	16,943	25,598	15,538	15,106	15,709	15,160	15,075	15,565	17,326	18,888	1,277,383
Iowa	1917	6,908	2,548	1,684	1,068	927	1,130	1,213	973	1,043	1,025	920	390,786
Kansas	1918	7,562	2,675	2,745	888	664	915	1,109	1,263	1,330	1,122	1,105	387,059
Kentucky	1967	99,500	42,557	84,241	68,847	63,032	69,212	77,200	82,747	85,766	93,156	99,500	3,292,353
Maryland	1907	5,533	1,443	2,051	748	757	821	1,102	1,136	1,210	1,222	1,250	274,517
Missouri	1917	5,671	3,273	4,236	2,890	2,930	2,886	3,174	3,254	3,544	3,382	3,350	312,041
Montana	1944	4,844	2,804	3,179	313	371	392	343	346	364	419	365	173,621
New Mexico	1918	4,023	1,250	1,443	295	412	677	1,565	2,960	3,212	2,755	3,520	140,873
North Dakota	1967	4,100	2,072	2,780	2,525	2,726	2,733	2,389	2,637	2,732	3,343	4,100	116,512
Ohio	1920	45,878	29,289	37,548	33,957	32,226	34,125	36,790	37,310	39,390	42,331	45,870	2,260,555
Oklahoma	1920	4,849	1,188	3,421	1,342	1,032	1,046	1,008	1,028	974	843	820	187,543
Pennsylvania	1918	178,551	92,584	147,099	85,425	82,652	85,315	71,501	76,531	80,308	81,442	79,400	6,811,035
Tennessee	1956	8,848	5,185	6,258	5,931	5,560	6,214	6,121	5,990	5,885	6,330	6,750	437,537
Utah	1947	7,429	3,285	7,429	4,955	5,159	4,297	4,360	4,720	4,592	4,835	4,150	295,181
Virginia	1967	37,900	13,331	20,171	27,690	30,332	29,471	30,531	31,054	34,053	35,985	37,900	1,095,294
Washington	1918	4,552	1,697	1,119	220	151	235	250	69	55	59	63	149,555
West Virginia	1947	176,157	108,362	176,157	118,944	113,070	111,499	132,568	141,499	149,991	149,681	152,500	7,427,927
Wyoming	1945	9,847	5,373	8,051	2,024	2,519	2,589	3,124	3,101	3,209	3,670	3,650	425,533
Other States	...	...	1,518	442	752	759	996	879	762	912	937	950	151,571
Total	1947	630,421	354,855	630,421	415,512	402,577	422,149	458,599	486,999	522,085	533,881	564,900	33,264,026

Source: U.S. Bureau of Mines.



Mine locomotive hauls string of cars from drift mine.

Coal Reserves of the United States

(Million short tons)

	Overburden 0-3,000 feet. Resources determined by mapping and exploration. Remaining resources in the ground as of Jan. 1, 1967					Estimated additional resources in unmapped and unexplored areas	Estimated total remaining resources in the ground, 0-3,000 ft. overburden	Estimated resources in deeper structural basins 3,000-6,000 ft. overburden	Estimated total remaining resources in the ground 0-6,000 ft. overburden
	Bituminous coal	Subbituminous coal	Lignite	Anthracite and semi-anthracite	Total				
Alabama	13,538	0	20	0	13,538	20,000	33,538	6,000	39,538
Alaska	19,415	110,674	[a]	[a]	130,089	130,000	260,089	5,000	265,089
Arkansas	1,640	0	360	420	2,420	4,000	6,420	0	6,420
Colorado	62,309	10,240	0	70	80,715	146,000	226,715	145,000	371,715
Georgia	12	0	0	0	12	60	72	0	72
Illinois	139,756	0	0	0	139,756	100,000	239,756	0	239,756
Indiana	34,779	0	0	0	34,779	22,000	56,779	0	56,779
Iowa	6,513	0	0	0	6,513	14,000	20,513	0	20,513
Kansas	18,686	0	[a]	0	18,686	4,000	22,686	0	22,686
Kentucky	65,958	0	0	0	65,958	52,000	117,958	0	117,958
Maryland	1,172	0	0	0	1,172	400	1,572	0	1,572
Michigan	205	0	0	0	205	500	705	0	705
Missouri	23,359	0	0	0	23,359	0	23,359	0	23,359
Montana	2,295	131,977	87,525	0	221,701	157,000	378,701	0	378,701
New Mexico	10,760	50,715	0	4	61,479	27,000	88,479	21,000	109,479
North Carolina	110	0	0	0	110	20	130	5	135
North Dakota	0	0	350,680	0	350,680	180,000	530,680	0	530,680
Ohio	41,862	0	0	0	41,862	2,000	43,862	0	43,862
Oklahoma	3,299	0	[a]	0	3,299	20,000	23,299	10,000	33,299
Oregon	42	284	0	0	332	100	432	0	432
Pennsylvania	57,533	0	0	12,117	69,650	10,000	79,650	0	79,650
South Dakota	0	0	2,601	0	2,601	1,000	3,601	0	3,601
Tennessee	2,652	0	0	0	2,652	2,000	4,652	0	4,652
Texas	6,648	3	6,875	0	12,526	14,000	26,526	0	26,526
Utah	32,100	150	0	0	32,250	48,000	80,250	35,000	115,250
Virginia	9,712	0	0	335	10,047	3,000	13,047	100	13,147
Washington	1,947	4,194	112	5	6,183	30,000	36,183	15,000	51,183
West Virginia	102,034	0	0	0	102,034	0	102,034	0	102,034
Wyoming	12,459	358,011	[a]	0	120,710	325,000	445,710	100,000	545,710
Other States	[b]531	[c]4,057	[d]86	0	4,721	1,000	5,721	0	5,721
Total	672,955	429,210	447,647	12,980	1,559,981	1,313,080	2,872,961	337,105	3,210,066

Figures are for resources in the ground, about half of which may be considered recoverable. Includes beds of bituminous coal and anthracite 14 in. or more thick and beds of subbituminous coal and lignite 2½ ft. or more thick.[a]

[a] By Paul Averitt, U.S. Geological Survey.

[b] Estimates from published reports of the U.S. Geological Survey and individual State Surveys reduced by production and losses in mining from date of estimate to Jan. 1, 1967. Losses assumed to be equal to production.

[c] Estimates by G. H. Ashley (Pennsylvania), H. C. Beekman (Washington), M. L. Corbett (Montana), J. Hazel and C. A. Brant (Ohio and North Carolina), W. C. Culbertson (Arkansas), N. A. Eby (Pennsylvania), D. R. Hasey (Arkansas), E. R. Landis (Colorado and Iowa), E. T. Luther (Tennessee), R. S. Vasser (Oregon), F. C. Peterson (Kaiparowits Plateau, Utah), J. A. Simon (Illinois), J. V. A. Trumbull (Oklahoma), C. E. Weir (Indiana), and Paul Averitt for the remaining States.

[d] Small resources of lignite included under subbituminous coal.

[e] Small resources of anthracite on the Dering River bed believed to be too badly crushed and faulted to be economically recoverable.

[a] Small resources of lignite in beds generally less than 28 in. thick.

[b] Arizona, California, Idaho, Nebraska, and Nevada. Bituminous coal in Black Mesa bed, Arizona included under subbituminous coal.

[c] Arizona, California, Idaho.

[d] California, Idaho, Louisiana and Nevada.

Source: U.S. Geological Survey

LATIMER DEPOSITION EXHIBIT 25

September 25th
1964

Mr. R. J. Hepburn

GRUNDY COUNTY, ILLINOIS

North of Morris there are approximately 3200 acres north of Interstate 80 and west of Illinois 47, which is indicated as No. 2 coal under the 75′ overburden line. West of this the coal continues for one-half mile to a mile before the 100′ overburden line is reached. I can find no ownership by any coal companies. This is very good farm land, but probably not quite as high value as that mentioned northwest of Ottawa.

In and around the town itself Sentry Royalty Company owns a considerable acreage consisting mostly of old strip pits formerly operated by the McElvains. This was acquired when Northern Illinois, Broken Arrow, Homestead, Sunlight and Wilmington Coal Mining merged with Sentry.

South of Morris the Sentry holdings are shown on the plat book and I can find nothing that they acquired since the merger. We have wondered why the old Northern Illinois pit stopped in Sections 17 and 20-33-7, and did not mine the coal between that line and the Mason River. I find that Northern Illinois showed several pieces in here when they were operating, but the tracts were all owned by people who also owned land in the old Northern Illinois area. All but one of these pieces were sold off and Sentry has only 40 acres in the SW¼ of Section 18. This may indicate that the coal is either not there or not mineable.

East of Route 47 and west of the Mason River, there are approximately 1000 acres under 75′ indicated and this can be increased by about 2460 acres by going to the 100′ cover line. All of this is a moderate grade to good farm ground and over 50 owners are involved. There is another 640 acres north of and adjoining this

which is under 75', but it contains many small homes, a new subdivision and a cemetery and I don't think there would be much chance to get it. Adjoining this on the east side of the Mason River there are about 1500 acres of pretty good farms probably under 75' of overburden.

South of Morris, west of Route 47 in the only mineable coal shown under 75' is the Material Service gravel pit on which you already have a report from Bob Inman. South of this there is less than 1000 acres between 75' and 100' and I don't think you would want to try to mine it. Most of it is very poor grade, but it too is probably a future gravel pit.

There is no ownership by any coal companies that I can find other than that shown on the plat book.

T. H. LATIMER

THL/ah

LATIMER DEPOSITION EXHIBIT 38

July 19th
1966

Mr. R. H. Inman

As I understand it we are only planning to take up three of the options to lease we presently have. One of these, Tillery, must be renegotiated as his present contract covers 160 acres and we only want 40 of it. These contracts are as follows.

Tillery expires August 15th—160 acres—$5440.00 payment *

Allen expires September 1st—40 acres—$1360.00 payment

Pollack expires September 24th—240 acres—$8160.00 payment.

* Renegotiate or drop

Exercising of any of these will make us liable to take up the Mason contract of $42,350.00 on November 8th. This contains 182,000 tons.

As I have reported to you we are having very little success in taking up additional leases in the field. We are in an area of better and independent farmers who are tired of having optioned and will not take royalty contracts. Some of them also want an amount equal to a years taxes for permission to drill and will only grant short time options to purchase and higher prices, perhaps $500.00 or more with the right to take other property in exchange instead of cash. They are difficult to deal with, but we might drop the Tillery contract and let him know we will try to make a deal on 40 acres later and this would give us until a week or so before September 1st to try to negotiate new contracts and drill them all out. Otherwise, I think we will have to drop the field.

T. H. LATIMER

THL/ah

cc: Mr. D. H. Emling

LATIMER DEPOSITION EXHIBIT 48

February 10th
1961

Mr. R. J. Hepburn

HUNTSVILLE FIELD—SCHUYLER COUNTY

Rusty and I have covered this area pretty well, and as you have been informed, several of the land owners would like to option. While it is impossible to make an estimate of the field without drilling, judging from the many strip pits and outcrops, we should have options in each of the following sections:

3, 4, 5, 6, 7, 8, 9, 10, 11,
14, 15, 16, 21, 22, 23, 28.

I do not mean that we should option the entire 10,240 acres at this time, but as people from each section come to us it would be well to have an option in each section. Should 60% of the area be coal bearing and under 80' of overburden, this would give a potential of 18,340,000 tons of coal.

North and west of Huntsville township there is also an area of perhaps 5,000 acres extending over to a point very close to the Burlington Railroad.

From the center of the Huntsville township field it is 7 miles air line to the Burlington on the northwest and 9 miles to the Wabash to the southwest.

T. H. LATIMER

THL/ah
cc: Mr. E. B. Campbell

GOVERNMENT EXHIBIT Mag. Dep.

GENERAL DYNAMICS
CORPORATION

445 PARK AVENUE, NEW YORK 22, N.Y.

To the Share Owners: November 24, 1959

Your proxy is being requested to vote in favor of the merger of Material Service Corporation of Chicago, Illinois, a leading Midwest producer and supplier of building materials, concrete, coal and limestone, into General Dynamics Corporation as the Corporation's Material Service Division.

The Directors of Dynamics believe that the merger of MSC into Dynamics is not only to the immediate and long-term financial advantage of the share owners, but serves well a basic corporate objective of Dynamics, namely, to generate commercial earnings that will balance earnings from defense projects.

Position of Dynamics in Defense

Since the security of the nation is of paramount importance, the Directors of Dynamics are satisfied that large-scale defense activities must be a major and long term function of the American economy.

The Directors are equally satisfied that Dynamics will continue to contribute in large and important measure to the aircraft, missile, space, electronic and nuclear programs of this nation.

Position of Dynamics in Commerce

Despite the long term needs of the nation's various defense programs, considerations of growth and stability dictate that a conservative corporate management actively seek diversification in commercial, non-defense business.

The Directors expect to achieve this diversification through development of commercial products stemming from present programs, such as: the Corporation's Convair 880/600 jet transports; Canadair's commercial turbo-prop CL-44 and CL-540 aircraft; General Atomic's nuclear research, maritime and power reactors; Liquid Carbonic's industrial gases; and Stromberg-Carlson's telephone and high fidelity sound equipment; and from the acquisition of companies which, because of technical capability, quality products and managerial competence, have demonstrated substantial earning power in industries basic to the nation's commercial future. The Directors are of the opinion that MSC is such a company.

Advantages of Merger to Dynamics

Members of the Board of Directors and the Board of Management, after careful study and inspection of the organization, management techniques, properties, equipment and skills of MSC, believe that the earnings record of MSC is due to management competence, and to a high degree of mechanization of mines, quarries, plants and transportation equipment, resulting in competitively lower-cost operations.

Dynamics would acquire an enterprise with an experienced management team of proven capability accustomed to operating under vigorous competitive conditions and with the most modern of extraction and transportation equipment, supplying basic materials to the steel, utility and construction industries.

The acquisition of a supplier of materials to the steel, utility and construction industries would give Dynamics basic participation in the expansion of the nation's physical plant and facilities to meet the demands of the growing economy and the accelerating population growth.

* * *

3. Freeman Coal Mining Corporation:

Freeman Coal Mining Corporation, an Illinois corporation and a wholly-owned subsidiary of MSC, operates directly or through a subsidiary 4 coal mines, namely, Crown Mine, Orient #3 Mine, Freeman Mine #4 and Orient #2 Mine, and has a fifth mine, Orient #5 Mine, under construction. All of such mines are located in Illinois. Each of the mines has an adjacent preparation plant. Effective as of the merger, all the coal reserves in and adjacent to each mine which are owned or controlled, directly or indirectly, by members of the families of Henry, Irving, Herman and Edward A. Crown ("Crown families") will be leased to Freeman on a royalty basis.

According to "Coal Age" for February, 1959, Freeman, with the production of these mines, ranked ninth among coal companies in the United States for tonnage produced in 1958. The production of these 4 mines in 1958 aggregated 6,872,541 tons, as follows—Crown Mine—1,578,623 tons; Orient #3 Mine—3,032,634 tons; Freeman Mine #4—1,071,377 tons; and Orient #2 Mine—1,189,907 tons.

The Crown Mine is located about 27 miles south of Springfield, Illinois, in Montgomery County. The coal reserves in and adjacent to this mine include a block of approximately 130 million tons of Number 6 seam coal, 6 to 8 feet in height and of relatively uniform quality. The sulphur content is approximately 3½% and the BTU value is approximately 10,700 per pound. The estimated life of the deposit is approximately 70 years based on the rate of production in 1958. The coal produced by the Crown Mine is used principally for consumption by utilities. The most important contract for the sale of the Crown Mine's production is with one public utility. The lessor of the coal reserves is comprised of several trusts, the principal beneficiaries of which are members of the Crown families. The surface lands around the mine are owned by Freeman.

The Orient #3 Mine is located in southern Illinois. The coal reserves in and adjacent to this mine include a block of approximately 220 million tons of low sulphur, Number 6 seam coal, 7 to 12 feet in height. The sulphur content is about 1% and the BTU value is approximately 12,200 per pound. The estimated life of the deposit is approximately 65 years based on the rate of production in 1958. The lessor of the coal reserves is a wholly-owned subsidiary of The Chicago, Wilmington and Franklin Coal Company, a Massachusetts corporation, which is controlled by members of the Crown families.

The Freeman Mine #4 is located in southern Illinois. The coal reserves in and adjacent to this mine include a block of approximately 30 million tons of Number 6 seam coal, 6 to 7 feet in height. The sulphur content is about 2½% and the BTU value is approximately 12,300 per pound. The estimated life of the deposit is approximately 20 years based on the rate of production in 1958. The lessor of the largest of the three leases covering the reserves of this mine is comprised of several trusts, the principal beneficiaries of which are members of the Crown families.

The Orient #2 Mine is located in southern Illinois. The coal lands are leased and cover a block of approximately 2,800,000 tons of Number 6 seam coal, approximately 8 feet in height. The sulphur content is about 1¾% and the BTU value is approximately 12,150 per pound. The lessor of the coal lease is a wholly-owned subsidiary of The Chicago, Wilmington and Franklin Coal Company. The surface lands around the mine are owned by Orient Number Two Coal Company, a wholly-owned subsidiary of Freeman. It is contemplated that the operation of this mine will be continued for approximately 18 months at which time it is anticipated Orient #5 Mine will be in operation.

The Orient #5 Mine is located in southern Illinois. This mine is under construction and will be in operation in approximately 18 months. The coal reserves in and adjacent to this mine include a block of approximately 32 million tons of Number 6 seam coal, 8 to 10 feet in height. The sulphur content is about 1¾% and the BTU value is approximately 12,150 per pound. The planned rate of production is 1,600,000 tons per year. If this rate is maintained, the life of the deposit is estimated to be approximately 20 years. The surface lands around the mine are owned by Freeman. There are 2 coal leases. The lessor under one of the leases is a wholly-owned subsidiary of The Chicago, Wilmington and Franklin Coal Company. The lessor of the other lease is comprised of several trusts, the principal beneficiaries of which are members of the Crown families.

The royalty rates provided for in the leases covering these 5 mines range from 7.5¢ to 13.1¢ per ton; only a minor portion of the tonnage is subject to a royalty in excess of 10¢ per ton. The

* * *

(c) As of October 31, 1959, MSC owned 231,503 shares of Common Stock (approximately 34% of the issued and outstanding shares of such stock) of The United Electric Coal Companies, which shares will be acquired by Dynamics upon the merger.

(d) Forty-one stockholders of MSC, consisting of Henry, Herman, Irving and Edward A. Crown, of members of their families, of trusts of which certain members of their families are the beneficiaries, and of the Arie and Ida Crown Memorial, a charitable foundation of which Henry, Irving and Edward A. Crown are directors, own of record 74,323 shares of Common Stock of MSC, or over 97% of the 76,543 shares of such stock outstanding at October 31, 1959.

REMUNERATION OF CERTAIN DIRECTORS AND OFFICERS OF GENERAL DYNAMICS CORPORATION AND OF MATERIAL SERVICE CORPORATION

General Dynamics Corporation

The following information with respect to the remuneration of Directors and officers of Dynamics for the year ended December 31, 1958 and with respect to the estimated annual benefits upon retirement of the persons named appeared in the Proxy Statement of Dynamics dated March 27, 1959, which was mailed to stockholders of Dynamics in connection with the Annual Meeting of Share Owners held on April 23, 1959:

The following tabulation sets forth the direct remuneration of each Director, and of each of the three highest paid officers, of Dynamics whose direct aggregate remuneration from Dynamics and its subsidiaries exceeded $30,000 in 1958, and of all Directors and officers as a group, and the estimated annual benefits upon retirement of the persons named:

Name of individual or identity of group	Capacities in which remuneration was received	Aggregate remuneration for the fiscal year ended 12/31/58(b)	Estimated net remuneration after current income taxes (c)	Estimated annual benefits under applicable retirement plan(d)
Frank Pace, Jr.	Director and President of the Corporation; Chairman of the Board and Director, Canadair Limited	$ 144,167	$89,386	$66,000
Earl D. Johnson	Director and Executive Vice President of the Corporation; Vice Chairman of the Board and Director, Canadair Limited	126,750	55,497	35,450
Joseph T. McNarney (a)	Director and Senior Vice President of the Corporation; Consultant to the Corporation	80,282(e)	42,957	(e)
J. V. Naish (a)	Senior Vice President of the Corporation; President, Convair Division	105,750	50,348	31,768
All Directors and officers of the Corporation as a group (including the above named, but excluding assistant officers)		1,448,234	not applicable	not applicable

(a) Mr. McNarney retired as a Senior Vice President of the Corporation and as President of the Convair Division of the Corporation, effective March 31, 1958, and continued as a consultant. On April 25, 1958 Mr. Naish who had previously been Executive Vice President of the Convair Division, was elected a Senior Vice President of the Corporation and President of the Convair Division.

(b) Includes incentive compensation payments made in 1958 with respect to 1957 operations as follows: Mr. Johnson, $40,000; Mr. McNarney, $35,000; Mr. Naish, $35,000; all Directors and officers of the Corporation as a group (including the foregoing, but excluding assistant officers), $315,500. The Incentive Compensation Plans of the Corporation and Canadair Limited provide for the distribution of a maximum of 5% of the profits before taxes with respect to any given year after deducting therefrom an amount which after taxes is equal to a 6% return on capital employed, as defined in said Plans; persons eligible to participate are those employees of the Corporation or of Canadair Limited, respectively, who are mainly responsible for management operations.

(c) After Federal income taxes, assuming no other income during 1958, each individual being married, having two dependent children and filing a joint return, and 1958 tax rates.

(d) These estimates computed as of December 31, 1958 assume retirement at normal retirement age and include the amount of benefits provided by the individual's own contributions as well as those made by the Corporation.

(e) Mr. McNarney does not participate in the Retirement Plan of the Corporation, but, in addition to a consulting agreement, has a contingent deferred remuneration agreement under which he qualified on April 1, 1958 for additional compensation, provided that he complies with the conditions of his contract of employment. The amount of $3,779 of such compensation was accumulated during 1958 through the date of Mr. McNarney's retirement, after which date no further accumulations were or will be made under said agreement. As of December 31, 1958 the unpaid balance of such compensation amounted to $86,644, payable over a period of years at the rate of $453 per month; upon death, any unpaid balance is payable to his beneficiary.

* * *

9/30/66

MAGUIRE DEPOSITION
EXHIBIT 35

7. United Electric Coal Companies - Purchase of Stock

The Chairman referred to the discussions at the last Board meeting regarding the purchase of additional stock of United Electric Coal Companies. He reported that, as authorized by the Board, the Corporation had acquired 48,400 shares of UEC from Material Service Employees Profit Sharing Trust at $50.50 a share, which represented the cost to the Trust of acquiring and carrying the stock.

The Chairman then stated that management had considered further the advisability of acquiring the remaining minority interest in UEC and, for various reasons, had concluded that the Corporation should proceed with a plan of acquisition at this time. He asked Mr. Sargent to present the management's views.

Mr. Sargent reviewed for the Directors the charts containing financial data on UEC which had been presented at the

last Board meeting, and noted the amounts that would be required on various assumptions to acquire the remainder of the UEC stock. He stated that the management still felt that the most direct method of acquiring the balance of the UEC stock was through a combination of a tender offer for an additional 170,000 UEC shares, which would bring the Corporation's holdings to slightly more than 90%, and a "short form" merger, available under Delaware law to a 90% holder, under which any remaining minority would be paid the fair value of their shares. He stated that under the "short form" merger provisions, UEC could be merged directly into the Corporation or into a new Delaware subsidiary to which the Corporation would first transfer its UEC shares, in either case by action of the Board of the parent. He stated that if the tender offer were a success the merger would be effected as promptly as possible and steps would be taken to provide management for UEC and to combine UEC and Freeman marketing and other administrative functions and staffs where efficiencies and cost reductions could be achieved. He stated, however, that in the first instance the UEC coal properties and contracts would be held separately from those of Freeman, most probably in the new Delaware subsidiary.

Mr. Sargent then reviewed the various considerations in support of the management view that the minority interest in UEC should be acquired and that Freeman and UEC should be combined as soon as possible, including a review of UEC's limited coal reserves and the resulting problems UEC had encountered in obtaining and keeping long term contracts, the ability of Freeman to provide a back-up of reserves over the long term and finally

the requirement for a new chief executive officer and other key personnel on which action should be taken promptly. He also reported that the New York Stock Exchange indicated its intention to delist UEC within the next few weeks. He stated that, in general, the combination of the two operations made good business and operating sense and would insure the ability of the enterprise to compete more effectively in its market. He stated further that, under all the circumstances, the Corporation's legal staff was not aware of any legal reason why the Corporation should not proceed with the plan.

The Directors discussed the matter of a tender offer price, in the course of which it was pointed out that it is normal in tenders of this kind to offer a premium over market of between 15% and 20%. Mr. Sargent then reviewed the market action of UEC stock over the last few months in which he noted that in July, when the possibility of a tender offer was first discussed, UEC was selling at 39-1/2, and that on August 3, the day before the meeting of the Board at which the tender offer was to be considered, the price of UEC had risen to 49. He stated that subsequent to the August meeting the price of the stock dropped sharply. The current market is about 42. Mr. Sargent then stated that, in his opinion, the Corporation should not, under present conditions, pay more than $50 a share on the tender offer, which provided a sufficient premium over the market. The consensus of the Directors was that $50 a share would be a proper offering price at this time.

Mr. Sargent answered questions by various Directors about the Corporation's cash position, the status of bank loans,

the effective rate of interest being paid, compensating balances, and all other factors relating to the Corporation's ability to finance the tender offer and the payout to the minority stockholders on the "short form" merger. The remaining Directors were polled and, in view of the business considerations detailed by management, all concurred in the recommendation to proceed with the tender offer.

Mr. Sargent stated that, as he had noted earlier, on a Delaware "short form" merger, the minority are entitled to be paid the fair value of their shares, exclusive of any element of value arising from the merger. In the first instance the Corporation or the Board of the new subsidiary would set the price, and any UEC share holder objecting to the price could seek appraisal under Delaware law. He stated that management did not have a final recommendation on the price to be offered on the merger, but that he was certain that it would not exceed $50 a share and might be less.

Mr. Sargent stated that it was proposed that Chase Manhattan Bank be designated as Tender Agent, that Georgeson & Co. be retained to assist on the tender offer and that a fee of 50 cents a share be paid to soliciting brokers. He then submitted to the meeting the proposed Invitation for Tender and Form of Tender and Assignment. He stated that these documents were substantially as submitted and reviewed at the August Board meeting, except that UEC earnings data for the first nine months of the year had been included. He stated that the documents had also been cleared with the New York Stock Exchange. The Chairman

directed that copies of the proposed Invitation for Tender and Form of Tender and Assignment be filed with the records of the meeting.

Mr. Sargent stated that, in addition to authorizing the tender offer and related action, it would be appropriate at this time for the Board to authorize the management, in its discretion, to organize a new Delaware subsidiary, to transfer the UEC stock to such subsidiary and to take such other action as would be required to effect the "short form" merger on the basis proposed. He stated that it was expected that the definitive plan for the combination of UEC and Freeman would be developed in time to permit its consummation by the end of the year.

After further discussion, on motion duly made, seconded, and unanimously carried, it was

RESOLVED, that the Corporation make an offer (hereinafter in these resolutions called the Tender Offer) to purchase shares of Common Stock of The United Electric Coal Companies (hereinafter in these resolutions called UEC) by inviting tenders for such shares at a price of $50 per share in the manner and on the other terms set forth in the instruments hereinafter in these resolutions approved; and further

RESOLVED, that the form, terms and provisions of the proposed Invitation for Tenders and the proposed Form of Tender and Assignment to be used in connection with the Tender Offer, copies of which have been submitted to this meeting, be, and hereby are, approved, with such changes therein as the President or the Vice President-Finance of the Corporation and Counsel for the Corporation may deem necessary or advisable and approve; and further

RESOLVED, that The Chase Manhattan Bank, N.A., be, and hereby is, designated as Tender Agent of

the Corporation for the purposes of the Tender Offer; and further

RESOLVED, that the President, the Vice President-Finance or the Secretary of the Corporation be, and each of them hereby is, authorized to

(a) engage The Chase Manhattan Bank, N.A., as Tender Agent of the Corporation in connection with the Tender Offer;

(b) extend the termination date of the Tender Offer to such date (not later than November 21, 1966) as they or any of them shall determine;

(c) pay commissions or fees to brokers responsible for soliciting tenders of shares of Common Stock of UEC;

(d) retain solicitors to assist in connection with the Tender Offer;

(e) deliver to the Tender Agent such instructions as they or any of them shall deem necessary or proper in connection with the Tender Offer (which instructions shall designate the persons authorized to act for and on behalf of the Corporation in connection therewith); and

(f) take all such other action as they or any of them shall deem necessary, proper or advisable in connection with the Tender Offer and the implementation of these resolutions or any of them; and further

RESOLVED, that the President, the Vice President-Finance, or the Secretary of the Corporation be, and each of them hereby is, authorized to take all such action, in the name and on behalf of the Corporation, as shall be necessary or proper to

(a) at such time as the Corporation shall own not less than 90% of the outstanding stock of UEC, cause UEC to be merged into the Corporation and, in connection therewith, set the terms and conditions of the merger (provided that the consideration to be paid for shares of UEC shall not exceed $50 a share) and execute and file a certificate of ownership and merger, all in accordance with Section 253 of the Delaware General Corporation Law;

(b) form a new corporation under the laws of the State of Delaware (hereinafter called New Corporation);

(c) execute, in the name and on behalf of the Corporation, a subscription agreement with New Corporation providing for the purchase by the Corporation of all the authorized capital stock of New Corporation for not more than $1000;

(d) as an alternative to the actions authorized pursuant to (a) above, transfer to New Corporation, as a capital contribution, all the shares of Common Stock of UEC owned by the Corporation (including, but not limited to, the shares of Common Stock of UEC to be purchased by the Corporation pursuant to the Tender Offer); and

(e) at such time as New Corporation shall own not less than 90% of the outstanding stock of UEC, cause UEC to be merged with and into New Corporation in accordance with Section 253 of the Delaware General Corporation Law upon such terms and conditions as said officers or any of them shall deem advisable, and in connection therewith to cause the Corporation to advance to New Corporation such funds as may be necessary to enable New Corporation to effect the terms of said merger.

MIDDLETON DEPOSITION
EXHIBIT 4

CONTROL TECHNIQUES FOR PARTICULATE AIR POLLUTANTS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Consumer Protection and Environmental Health Service

experimental installation. Evaluation of the economic feasibility and effectiveness of this system must be deferred until after shakedown runs are complete.

Electrostatic precipitators - Electrostatic precipitators are the most common gas cleaning devices used to remove particulates from the flue gases of large stationary combustion sources. Such devices are capable of collection efficiencies of at least 99.5 percent, and it is quite possible that even more efficient systems can be provided if necessary. Electrostatic precipitator systems are usually applied to large pulverized coal-fired power boilers. The cost of these systems has limited their use on smaller combustion sources.

Electrostatic precipitators are highly sensitive, and if not properly designed, small changes in the properties of the particles and the gas stream can significantly affect their collection efficiencies.[22] Allowance should be made for possible changes in fuels, in fuel composition, and in gas temperature when consideration is given to the use of electrostatic precipitators. It has been established that low-sulfur fuels adversely affect the particulate collection efficiency of electrostatic precipitators designed for high-sulfur fuels.[23]

Fabric Filters - Fabric filters are not commonly applied to stationary combustion sources. Factors which limit the use of these devices are uncertainty of performance and reliability, and availability of other effective gas cleaning devices.

* * *

MORRIS DEPOSITION EXHIBIT 3

December 17, 1959

Mr. J. M. Morris:

We have made another checkup or study on the amount of coal left in our Danville property. Producing as we are at this time, we estimate that our coal will run through the month of June. It is possible there will be some to take out after the miners' holiday, but it will depend on how the requirements of the light company are between now and then. If we come up to vacation time and it looks as if there is a small amount of coal left, we probably would be better off to work through the vacation period and complete it rather than go on vacation and then come back.

We have made a further study of the acreage just north of us on which we had hoped to pick up 250,000 to 300,000 tons of coal. In our previous drillings we had put some holes down for checking this possible amount of tonnage and evidently were unfortunate enough to have several of our drill holes go through some pillars. After plotting from an old map obtained of some underground workings and doing some additional drilling, we found that a considerable amount of what we thought could have been coal had previously been mined by underground methods. Taking this map, therefore, as being correct, and taking into consideration the gas line that crosses this property, there would be a small area of approximately eleven acres that could be mined without removing or moving the gas line, but to do this, box cut spoil would have to be thrown over the line and then leveled. This area, being of the nature it is, already congested with homes and businesses, would be very hard to mine without doing extensive reclamation and leveling. Taking for granted that the royalty we would have to pay for this coal would be offset by depreciation for an additional three months of operation, we theoretically should make 65¢ a ton on the one hundred thousand tons available. However, we would have to extend our power lines, drainage, a haulage road, and other incidentals, which could run easily $15,000 to $20,000, and we in operations feel that from a mining standpoint we should not consider mining this area and therefore have come to

the conclusion that the Danville mine will terminate as a strip mine the middle of the summer.

Another suggestion that we may have for Danville might be the purchase of the V-Day Coal Company, operated by Mr. Zamberletti. He has an underground operation across the hard road from our Mary Moore property which he has been mining as he desires during the winter months, producing No. 6 underground coal which underlies our Mary Moore property and the Peabody Estate property to our south, where we have removed the upper or No. 7 vein. This No. 6 vein underlies the No. 7 seam 30-35 ft. which we have not drilled out but which from some of our drill holes seems to have pretty fair cover, some shale and rock. Under our Mary Moore property there could be a million two hundred thousand tons in place and an additional eight hundred thousand tons in place under the Peabody Estate. Mr. Zamberletti has other coal leases, and south of him we know that U.S. Steel controls underground No. 6 coal. Mr. Zamberletti has been approached and I believe his property would be for sale. It might be well to take this up with Mr. Nugent. They can make an inspection for us and engineering-wise help us. It might be the thing to do to purchase this property to continue our Danville light contract. If we could get an estimate of what the underground cost might be, this coal could be trucked from the slope opening in our trucks to our plant to be crushed for loading on the C. & E.I. Otherwise it would have to be crushed in his plant and then trucked to the light company. If this could be put into operation, I feel a slope could be put on or near our property, which would shorten the overland road, maintenance and haul, and cut out the crossing of a highly traveled state route.

I would be glad to discuss this situation with you or Mr. Nugent at any time.

/s/ R. J. Hepburn
R. J. HEPBURN

RJH:J

cc: Mr. F. F. Kolbe
Mr. J. T. Murray
Mr. L. W. Barco—#25
Mr. T. H. Latimer

MOR. DEP. EXHIBIT 4

CC: Mr. T. J. Tarzy
Mr. R. H. Inman
Mr. J. T. Murray

January 10, 1966

Mr. Frank Nugent, President
Freeman Coal Mining Company
Division of General Dynamics Corp.
300 West Washington
Chicago, Illinois

Dear Frank:

Here's something that may be worth looking in to. You recall our sales agreement with Ruby, Chandler-Jordan on the production of the Ruby Mine. This was a strip—went into operation in 1953 and mined out all of the #11 strip in the area in 1961.

They control the underground #9 in the same area approximately 1200 acres which would mine out about six million tons of raw coal. Coal appears to be from 100 to 150 feet deep, average 4.75 feet thick, slate roof and good average quality #9 coal comparable to that mined by West Kentucky Coal Company now at their East Diamond property. This field joins the East Diamond workings.

The tipple, washing plant, shop, store house and office buildings are still there and about 10,000 feet of railroad track. All of the above are in good condition and the original cost of the plant and buildings was approximately $500,000.00. For income tax purposes this was all charged out when the mine worked out the available acreage. So rather than re-open this tax case, the owners would sell to a prospective Lessee all of the above including land, for $10,000.00.

While the mine is local on the Illinois Central Railroad, the market for coal with the TVA at present is better for L&N origin coal. A connection could be built with the L&N requiring about 2′ miles of track, if you don't cross the IC. If permission could be secured to cross IC, there would not be over ½ mile of track necessary.

The present owners of the coal rights make the following offer: 20¢ per ton royalty on any coal sold at 3.25 per ton f.o.b. mine or loss; six percent of the increase in price on coal sold above 3.25; thus, with a 3.50 realization royalty would be 21½¢, with 4.00 realization, 24¢.

Advance royalty of $2,000.00 per month starting June 1, 1966, would be required; this to apply against earned royalty when mining commenced. Under the terms of their lease on this coal a slope must be started prior to May 1, 1966, to show good faith that coal is actually going to be produced and of course, the advanced royalty starts one month later.

Of course, for underground coal this royalty is rather high. Whether or not this is subject to negotiation, I don't know.

The six million ton reserves is not large, but with everything there, except underground equipment, necessary amortization might be such that over a 10 year period would justify operation.

Also, I have another coal field in mind which I think we can acquire and after we are through here, equipment that is movable could be put into production at the other spot.

It occurred to me that this might offer an opportunity to gain a foothold in the West Kentucky Field and while it is not exactly what we would want, still, it has some possibilities.

George Chandler, 400 Country Club Lane, Madisonville, telephone 821-3188, is the man to contact and Abe Moore, attorney, MOORE, MORROW & FRYMIRE, telephone 821-6165, handles their legal affairs.

If this appears interesting you can contact either one of the above and arrange for some of your people to investigate it further.

I will be leaving here tomorrow and should arrive at St. Pete sometime Thursday. My telephone number there is area code 813, 898-8868.

Best regards.

/s/ H.M.
/md

Corr. Dep.
5

THE UNITED ELECTRIC COAL COMPANIES
307 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60601

March 14, 1966

Mr. Frank Nugent
Boca Raton Hotel & Club
Boca Raton, Florida

Dear Frank:

I will see you next week but in the meantime wanted to bring you up to date on the No. 9 seam underground coal near Clay, Kentucky, about which I have given you some information.

Joe Davis, who owns this, is now in a frame of mind to discuss turning it over to some company like Freeman for a future mine on the property. In the meantime two oil companies have entered the scene and are making a determined effort to get control of the reserves. He realizes, however, that this is a long-range proposition and probably will not mean a coal mine in the foreseeable future.

He also is still discussing with both Georgia and Alabama Power a long-term contract but has not as yet been able to get the kind of freight rate on a volume basis that appears necessary.

The TVA has a bid opening on March 29 and he may put in a price on this. He is talking in terms of $3.60 f.o.b. mine for raw No. 9 mine run, on which I am sure he can safely guarantee 11,900. This would be somewhat near recent award made to Bell & Zoller and might result in a contract. If he did get a contract, I think he would still be willing to discuss leasing the coal rights to someone else to operate.

I told him we were somewhat interested but it would take time to investigate and we would not commit ourselves until a thorough investigation and discussion could be had.

I will talk to you more about it when I see you.

Yours very truly,

Johnnie

JOC:EM

THE UNITED ELECTRIC COAL COMPANIES
307 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60601

May 3, 1965

GOVERNMENT EXHIBIT
Mor. Dep.
14

Mr. Frank Bogust, President
Freeman Coal Mining Corporation
A Division of General Dynamics Corporation
300 West Washington Street
Chicago, Illinois 60606

Dear Frank:

The attached statement shows the strip coal reserves at our various properties at the end of our fiscal year July 31, 1959 and as of April 30, 1965.

You will note approximately 10,000,000 tons more as of now, and during that period we produced at all mines 27,504,006 tons. This indicates that during the past six years we have acquired a total of approximately 37,000,000 tons assignable to strip operations.

The reserves shown for Cuba Mine ... 2,038,370 tons ... includes the present pit of about 500,000 tons which will be mined out the end of this year. The balance of approximately 1,500,000 tons is in the No. 6 field near the Cuba tipple. We do not plan on going into this area until after mining out that we hope to acquire from Truax in their West Cuba field, which we estimate will keep us operating for some eight or ten years.

Assigned to the Bushkeart property is the following:

Present Bushkeart area.	12,596,860 tons
South Bushkeart	11,256,275 "
North Canton field	17,518,958 "
	41,372,093 tons

If we complete our trade with Truax-Traer, because of the difference in overburden depth and thickness of coal seam, we will give up nearly 2,000,000 tons more in the North Canton area than we get back from them in the West Cuba field. Our reserves picture would then change by reduction in the 41,000,000 tons at Bushkeart and gain at Cuba, so our Bushkeart reserves will then total approximately 39,000,000 tons and our Cuba reserves approximately 8,000,000 tons. At an estimated 2,500,000 tons per year production at Bushkeart, we then would have about fourteen years life there and, as indicated above, from eight to ten years at Cuba.

You will note we have been unable to add any strip reserves of any consequence at Fidelity. We show 25,000,000 + tons April 30, 1965 against 28,000,000 tons July 31, 1959. Fidelity production should average about 2,000,000 tons per year and the present strip area on this basis would last about twelve years.

At Banner we mined during this period about 3,000,000 tons and show 8,006,781 tons now against 5,700,000 in 1959, so we have added there roughly 6,000,000 tons in the last six years. We think Harry Kitaljerg has around 1,500,000 tons which we should eventually get. Banner's production of approximately 700,000 tons annually, if we get Harry Kitaljerg's property, would give us a life there of about thirteen years.

I thought these figures would be of interest to you.

Yours very truly,

JHH:BF

THE UNITED ELECTRIC COAL COMPANIES

COAL RESERVES (STRIP)

Field	July 31, 1959	April 30, 1965
Cuba	4,894,127	2,034,370
Fidelity	28,258,953	25,065,515
Clinch	971,068	781,200
Buckheart	22,311,761	12,596,860
South Buckheart	344,812	11,256,275
Mary Moore	323,530	19,215
Banner	5,698,357	8,006,781
North Canton - near Buckheart	8,231,630	17,518,954
Gayle - near Fidelity	1,714,710	1,714,710
Industry - No. 2 seam (Schuyler & McDonough Counties)	8,976,117	12,550,457
Buffalo Creek #2 - West Ky. #6	1,399,399	1,399,399
Oklahoma	2,301,872	2,301,872
East Liverpool	344,842	344,842
	85,771,178	95,590,450

PRODUCTION AUGUST 1, 1959 THROUGH APRIL 30, 1965

Cuba	4,918,861
Fidelity	9,510,278
Buckheart	8,574,236
Mary Moore	1,427,934
Banner	3,072,697
	27,504,006

April 1965 tonnage estimated

NOT INCLUDED IN THE ABOVE: HAYDEN, COLORADO STRIP RESERVES, ESTIMATED AT 18,000,000 TONS, AND AN UNDETERMINED AMOUNT OF UNDERGROUND COAL.

5/2/65

GOVERNMENT EXHIBIT
Mor. Dep.
31

January 24, 1961

Mr. J. M. Morris:

With reference to your memorandum of January 24 concerning the Industry-McDonough No. 2 coal field, we had as of July 31, 1960, under our control approximately 4700 acres, of which 3300 acres contained coal amounting to approximately 12 million tons. This area is shown in orange and is covered by purchase contract, and that shown in yellow is now owned by the Company. We are showing where we think this No. 2 coal may lie within the blue outlines of the accompanying map. You will notice that this covers quite a distance in area of some fifteen or twenty miles from our present field. This is due, of course, to the estimated depth of the coal that we figure without drilling might be stripped. Our estimate, of course, is based on the contours from the Geological Department of the State, and in checking our drilling on the property we own with the contours in that location, they check fairly close. We therefore assume that these contours would be fairly close in these other areas, but it would not be our final opinion that this depth is accurate until we could be in a position to option some of this land and drill it out.

At this time we are having in mind a large area which might constitute 40 to 50 million tons of coal. If we have in mind a field of this type we must realize that we must have at least 20 thousand coal acres, which might consist of 30 to 35 thousand land acres. We must remember that for a mine of this type we would have to have several pits and no doubt several pieces of stripping equipment to maintain the production that might be desired. We feel that if all of this land were to be acquired, presuming that

the coal is there, we would have an investment of approximately $200 an acre. Some of this land might be purchased for $110 to $150 an acre; some may run $200 to $250. You can see from this that we would eventually have an investment of five to six million dollars in land. If this were purchased under a royalty agreement, I think we would still have the same investment because you would have to guarantee a certain royalty. However, the cost to the Company in an operating mine would naturally be reduced. We probably would spend 15 to 20 thousand dollars at least just in acquiring options of this magnitude, and to properly drill this entire area would be an estimate of $300,000. We figure that it would be $ per acre.

We should keep in mind that the land that we now control has a ratio of approximately 20-25 to one, and we naturally would try to obtain the same ratio throughout the No. 2 coal field, if possible, but no doubt to obtain a large tonnage we might go up to 35 or 40 to one readily. We of course will have to get some options in locations other than our present vicinity and get a few drill holes down to give us a better idea.

Also shown on this map in blue color is the property that we understand has been optioned by Ayrshire Collieries. We do not know that they have taken these options but we do know they are active in this field. The outer perimeter or circle covers what we think might be the entire No. 2 coal field. We must understand that in areas now included in our blue lines the coal could be 150-200' deep.

RJH:LJ

Mor. Dep. 32

February 24, 1960

Mr. T. J. Tarry
Mr. J. M. Morris

Springfield

With further reference to your information that the CIPS is very interested in building a power plant near Springfield if cheap coal is available, and asking if we could put anything together in any amounts or volume in this area:

We have done some drilling west of Springfield, which is deep coal, and our drill records do not show the best of roof conditions. However, I would want to check that with people more familiar with it than ourselves. I feel a considerable amount of tonnage could be put together as underground coal west and northwest of Springfield. We would, however, like to go a little further west to see the depth of the coal in that area.

If you think an opportunity might come up, we might get an option further west and get some drill holes which will assist us in spreading out in that area.

R. J. Hepburn

RJH:J

cc: Mr. R. H. Inman
Mr. P. H. Latimer

Mor. Dep. 35

July 17, 1962

Mr. J. M. Morris:

We are informed that there are approximately 12,200 acres of underground coal controlled by O. Stuart Jenkins of St. Louis located about six miles west of Greenville, Illinois. This is the No. 6 seam, having a thickness of 6-7 ft. and being approximately 350-400 ft. deep. We know nothing of the roof conditions nor have we seen any drill logs on this property, but it is for sale at $35.00 per acre.

This immediately joins a Peabody area of approximately the same size that I believe they acquired twenty years ago. Two miles south of this location at Pocahontas this coal was mined up to 1943 - the shaft being 420 ft. deep. Samples taken from this mine in 1921 by the Illinois Geological Survey show thicknesses of 6'8", 7'1", and 7'9", with the following analysis:

Moisture	11.9
Volatile	35.2
Fixed Carbon	42.2
Ash	10.7
Sulfur	3.4
B.T.U.	10,800

This is located between the Nickel Plate, the Burlington, and the Pennsylvania railroads, and Shoal Creek passes through the tract and might have water for a power plant.

I am wondering if you would want us to look into this and see what might be developed.

RJH:LJ

R. J. Holbrook

Bad Rock
40 feet - 7 Bolts
Structural

Morris Dep. Exp. 35
10-1-68
CBS

Mor. Dep. 38

February 3, 1960

Mr. John Davis,
Abraham Lincoln Hotel,
Springfield, Illinois.

Dear Johnny:

Montgomery County, Ill. (Coordinate field)

Sorry I have been so long in getting you some information on the drilling we did on your property. I do not have as yet an analysis from the outside concern. I will advise you of the analysis a little later on.

We did not get quite as many holes as we had hoped to due to weather and sickness. However, we did put down five holes, logs of which and a map are attached, showing the locations. From this drilling and from what coal we have found we feel that your farm would be underlaid with the Springfield #5 coal, the seam averaging approximately 5'-10" in thickness. This coal should run in place 10,000 tons to the acre. By underground methods we figure 60% recovery at the present time, however, with good roof conditions and up-to-date equipment this recovery could be improved. However, we would figure there would be 6,000 clean recoverable tons per acre. Figuring your acres as being 847, which shows on the plat book, you would have around 5¼ million tons of coal in place, and between five or six million tons of washed coal.

While we are not actually in the deep mine business at the present time and are not too experienced in it, we are looking forward to the time when we are underground. From our experience and the drill holes it appears that your roof is not of the best, about 2 feet of slate and 1 foot of rock on most of the holes. A little further study would and should be made on a definite decision. We drilled 90 foot below the first seam of coal and found the #2 coal seam which, however, was very thin and would not be profitable to mine under any circumstances.

I will send you the analysis as soon as it arrives, and while I am not making an offer to you for the coal under your property today I would say that I am interested and I know that you certainly would give me an opportunity in case something would come up in the near future. We want to do some more testing in and around the vicinity and it is possible that we might want to give you an offer someday. I would appreciate it if you would keep this information to yourself and not give it to anyone else. As a rule we do not give the property owner this much information.

Yours very truly,

Vice President

RJH:ga

cc: Mr. R. H. Dunn.

Mor. Dep. 38

CBS 10-1-68

GOVERNMENT EXHIBIT Mor. Dep. 42

THE UNITED ELECTRIC COAL COMPANIES
307 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60601

October 27, 1965

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
A Division of General Dynamics Corporation
300 West Washington Street
Chicago, Illinois 60606

Dear Frank:

No doubt you kept a copy of report prepared by your Mr. J. E. Matheson, Jr. on cost estimates to try out underground mining at Fidelity. Estimates were as follows on total cost in trucks in the Fidelity pit:

300 Tons per Shift	$3.077
400 Tons per Shift	$2.610
500 Tons per Shift	$2.385

The attached sheet shows costs accrued in trucks in the pit for the periods indicated.

Our fiscal year ended July 31, 1964 was the best in the history of the Company and Fidelity Mine was in very good stripping and operating conditions and achieved a cost of $1.45¢ for that period. For the period beginning August 1, 1964 and ended December 31, 1964, you will notice a sharp increase in our total stripping cost from 67.1¢ to 89.0¢, and for the nine months ended September 30, 1965, we again went up sharply due to opening the new Green pit, increase in drilling and blasting, and the necessity for operating two machines while we were developing this new pit.

I think a fair estimate of total cost in trucks is probably around $1.80 and this compares with the underground estimate, if we assume a middle-of-the-road basis of 400 tons per shift, of $2.61 in truck. It would appear that a difference of 80¢ per ton is too much to justify trying this method.

We can discuss this further sometime at your convenience.

Yours very truly,

JEMcM

Fidelity Mine
Analysis of Costs
Per Cost in Tunnels

	Fiscal Year Ended 7/31/47	5 Months Ended 12/31/47	9 Months Ended 3/31/48
Stripping Costs			
Drainage	.073	.282	.069
Drilling Overburden - Operation	.070	.115	.139
Maintenance	.096	.097	.056
Blasting Overburden	.182	.181	.258
Stripping Costs - Operation	.130	.129	.196
Maintenance	.079	.094	.101
Other Stripping Costs	.097	.183	.327
Total Stripping Costs	.627	.990	1.146
Ore Costs			
Stoping Cost	.012	.010	.012
Drilling Stoping Cost	.037	.042	.042
Loading Cost - Operation	.091	.091	.098
Maintenance	.026	.017	.022
Total Ore Cost Costs	.787	1.191	1.339
Welfare Fund	.700	.700	.700
Overhead (4/5 of total)	.187	.159	.177
Depreciation (4/5 of Total)	.205	.255	.276
Total Costs in Tunnels	1.679	1.815	2.078

October 20, 1948

Mgmt Exhs. for Pltf. 421
Case
10-1-48

1 756

MOR. DEP. EXHIBIT 46

February 14, 1961

Memorandum to Mr. J. M. Morris:

Re: *TVA Bid—Ruby Underground #9 Seam Mine*

Since talking with you regarding our proposed bid to be opened February 14th, I have talked to both Frank Nugent and Edwin Ruby regarding this proposition.

We had originally planned to put in a contingent bid on a long-term basis to develop this underground coal after the strip mine was exhausted. Later, after discussing this matter further, we felt that it may be best to delay making a bid until the next opening, and, in the meantime we could proceed with an up-to-date cost study to investigate the feasibility of developing this property.

Edwin Ruby says that he would be ready to go into this matter with us at our convenience.

/s/ T. J. Tarzy
T. J. TARZY

cc: Mr. Frank Nugent

P.S. to Mr. Nugent:

I believe you have read the Davis Read report on this property made in 1954. This report showed that there is approximately 6 million tons of recoverable #9 seam coal underlying 1,206 acres controlled by the Ruby-Chandler, Jordan-Moore group.

We can give you a copy of this Davis Read report for your preliminary studies if you so desire.

TJT

MOR. DEP. EXHIBIT 47

November 20th
1957

Mr. G. I. Grasty
Dixie Realty
P.O. Box 4252
Richmond Virginia

Dear Mr. Grasty:

Your letter of November 15th regarding coal lands in West Virginia and Kentucky has been referred to me, and I will be glad to receive full particulars and if possible, maps and any engineering reports you might have on both the coal in West Virginia and Kentucky. Before expressing any interest, it will be necessary for us to have as much information as possible on the names of the seams, thickness and quality of seam, actual areas of coal, in other words, a full and complete description of each property.

As you undoubtedly know, we are primarily engaged in stripping, but we are also interested in underground coal where mining and market prospects are attractive.

Very truly yours,

T. H. LATIMER

THL/ah

cc: Mr. R. J. Hepburn

MOR. DEP. EXHIBIT 55

April 26, 1965

Mr. John Morris
President
The United Electric Coal Companies
307 North Michigan Avenue
Chicago, Illinois 60601

Dear John:

I wonder if you would ask your Engineering Department to tell you where and how far the limestone is from the coal, and the thickness of the limestone, in the Round Perry Field.

It would also be helpful to know whether or not you have subsidence waivers. Possibly the Longwall System could be used in mining the coal.

Yours very truly,

FRANK NUGENT
President

FN/mf

November 29, 1962

GOVERNMENT EXHIBIT Mor. Dep. 59

Mr. Robert S. Overbeck, General Manager
Aluminum Company of America
1501 Alcoa Building
Pittsburgh 19, Pennsylvania

Dear Mr. Overbeck:

It was a pleasure to meet with you and Phil Dorrance on November 14th to discuss our mutual interests in the coal reserves being put together in Perry County, Illinois.

In looking back through our files I find it was on September 1, 1960 that Mr. Morris, Mr. Sherrill and I met with the following Alcoa people:

B. J. Fletcher
H. C. Erskine
J. D. Harper
B. H. Sloane
H. R. Althauser
Roy F. Miller

and it was at this meeting that two of the subjects discussed were -

(a) When Alcoa wishes to make use of the coal in Beaucoup Field for its own purpose, United Electric would like to have prior consideration for the mining operation on a basis to be decided on at that time, and

(b) Should United Electric have the opportunity to make use of the coal in Beaucoup Field for a consumer other than Alcoa, for instance, an electric generating station, we would like for Alcoa to agree to allocate up to, say, 50 million tons, to United Electric for that purpose. A method of payment for the coal could be worked out at that time, and at the same time the area from which the coal could be produced would be designated.

The total tonnage in situ for the field should be well over 200 million tons.

In general these are the two areas in which there was agreement and we should like to have acknowledgment in writing that Alcoa concurs in this understanding.

We have also given some thought to the idea that Alcoa might like to lease up to 50 million tons to United at the present time in an area and at a price to be mutually agreed upon. Such an arrangement would permit United to include the tonnage as reserves. We shall appreciate your comments on this.

Again thanking you for your courtesy, and with kind regards.

Sincerely yours,

Secretary

GEU:F

cc: Mr. J. H. Morris

Morris Dep.
Exh 54
10-1-69

ALCOA

Aluminum Company of America

150 ALCOA BUILDING

RAW MATERIALS DIVISION

Pittsburgh 19, Pa.

December 13, 1962

GOVERNMENT EXHIBIT
Mor. Dep.
60

GOVERNMENT EXHIBIT
Kol. Dep.
U

Mr. G. H. Utterback
Secretary
The United Electric Coal Companies
307 North Michigan Avenue
Chicago 1, Illinois

Dear Mr. Utterback:

Thank you for your letter of November 29. As I informed you at our meeting on November 14, I am relatively green on the subject of past understandings between our two companies and, therefore, agree with you that any such understandings should be clarified for the future by an exchange of letters. Consequently, I have discussed your letter with those still available who were present at the meeting on September 1, 1960 and particularly with Mr. Roy F. Miller.

Generally speaking, Alcoa's purpose in going into the Beaucoup Field was to acquire a coal reserve in a favorable location with no strings attached. Keeping this in mind, we do not know of any commitments made by Alcoa to United Electric other than those spelled out in our written agreements, but we do acknowledge the follow understandings:

(a) When Alcoa wishes to make use of the coal in the Beaucoup Field for its own purposes, United Electric will be given serious consideration for undertaking the mining operations on a basis to be decided on at that time, and

(b) At any time that United Electric should come up with a specific proposition for leasing part of the coal in the Beaucoup Field, Alcoa is willing to consider seriously such a lease.

Although our wording of these understandings varies somewhat from yours, it represents our considered opinion of what was discussed at the meeting of September 1, 1960.

Kolbe Dep. U.S. 10-28-68 and Morris Dep. Ex. 60 10-1-68

As regards the next to last paragraph in your letter, under Item (b) above, we will be glad to give serious consideration to any specific proposal that you might make at a time and place to be suggested by you.

We would appreciate your comments, but hope that the above is satisfactory and that you will confirm it in writing.

With best personal regards.

Sincerely yours,

R. S. Overbeck
General Manager
Raw Materials Division

RSO:jdk

GOVERNMENT EXHIBIT
Mor. Dep.
61

May 17, 1965

To - Mr. R. H. Inman, General Superintendent

Subject - AGREEMENT - Aluminum Company of America - Perry County, Illinois.

On May 3, 1965 this Company entered into Agreement with Aluminum Company of America covering certain property in Perry County, Illinois, which agreement supersedes and replaces Agreement dated September 5, 1956, letter agreement dated August 20, 1957, another letter agreement dated January 27, 1960 and a third letter agreement dated March 23, 1960.

A copy of Agreement dated May 3, 1965 is attached for your information and files.

Secretary

GHU:a

cc: Mr. J. M. Morris
Mr. J. T. Murray
Mr. T. H. Latimer

Attach.

Morris Dep. Ex. 61
(plus attachments)
10-1-68
CBS

AGREEMENT

WHEREAS, the relationship between ALUMINUM COMPANY OF AMERICA and THE UNITED ELECTRIC COAL COMPANIES, respecting certain property located in Perry County, Illinois, has been governed by a certain Agreement entered into by the parties September 5, 1956, and

WHEREAS, the said Agreement of September 5, 1956, has subsequently been amended by the letter agreement between the parties dated August 20, 1957, by another letter agreement dated January 27, 1960, and by a third letter agreement between the parties dated March 23, 1960, and

WHEREAS, the said parties to the above Agreement dated September 5, 1956, are desirous of both adding certain additional matter to this Agreement as amended and also of consolidating the above Agreement and its amendments into one document,

NOW, THEREFORE, THE UNITED ELECTRIC COAL COMPANIES, a Delaware corporation, having its principal office in Chicago, Illinois (hereinafter called "United") and ALUMINUM COMPANY OF AMERICA, a Pennsylvania corporation, having its principal office in Pittsburgh, Pennsylvania (hereinafter called "Alcoa"), intending to be legally bound, do hereby agree and covenant as follows in this AGREEMENT, made and entered into at Pittsburgh, Pennsylvania, this 3rd day of May, 1965.

1. United and Alcoa agree that this AGREEMENT shall supersede and replace the Agreement between the parties dated September 5, 1956, as amended by letter agreements dated August 20, 1957, January 27, 1960, and March 23, 1960, but shall not modify, alter, or release any of rights or duties which have heretofore arisen under the said Agreement as amended and which have not been fully performed or fulfilled.

2. In the course of performing the obligations contained in Articles 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, and 15, and in all dealings with others not a party to this AGREEMENT, United shall act in its own name and without disclosing that it is acting for Alcoa.

3. United, acting in good faith and with reasonable diligence, shall undertake to obtain recordable and assignable options for the purchase of the coal and coal mining rights, together with all other available minerals and mineral and mining rights, in at least Eighteen Thousand (18,000) acres but not more than Twenty-Five Thousand (25,000) acres of land located east and north of Pinckneyville, Perry County, Illinois as outlined in red on the map marked "Exhibit A" and attached hereto, paying to the owner or owners of said land as consideration for each option so obtained the sum of One Dollar ($1.00) per acre of land. United shall, insofar as is practicable, obtain said options in such a manner that the optioned tracts of land will be contiguous and constitute a solid block.

4. Until otherwise directed by Alcoa, each option so obtained shall be in the form marked "Exhibit B", attached hereto, and shall provide for payment of a total purchase price to the optioner or optionors not to exceed Fifty Dollars ($50.00) per acre of land.

5. Whenever United, acting pursuant to the provisions of Article 3 hereof, shall be unable to obtain an option to purchase the coal underlying any tract or tracts of land within the area outlined in red on "Exhibit A", it shall undertake to obtain a recordable and assignable lease of coal and coal mining rights with respect to said tract or tracts of land in the form marked "Exhibit C" and attached hereto.

6. United shall without undue delay cause each option and each lease obtained to be recorded in the appropriate records of Perry County, Illinois.

7. Immediately after each option or lease has been recorded, United shall convey, assign, and deliver each such option or lease to Alcoa or to such other person or corporation as Alcoa shall in writing nominate or appoint, without recording such conveyance or assignment.

8. United does hereby acknowledge and declare that it will hold

the leases, options, deeds, titles, properties, and interests obtained pursuant to this AGREEMENT in trust for Alcoa; that it will continue to hold any leases, options, deeds, titles, properties, and interests obtained pursuant to the Agreement dated September 5, 1956, in trust for Alcoa; and that United will not claim to have any right, title, or interest in any of said leases, options, deeds, titles, properties, or interests.

9. Unless otherwise notified by Alcoa, United shall give extension notices as provided for in each and every option agreement, and at the same time, shall pay to the respective optionors the consideration required by the option agreements. The extension notices will be in such form as Alcoa may prescribe. At the time of delivery of the notice of extension and payment of consideration, United shall obtain the optionor's written acknowledgment of receipt of notice and payment of consideration.

10. Unless otherwise notified by Alcoa, United shall make annual payments as provided for in each and every lease obtained pursuant to Article 5 hereof, and at the same time, shall obtain the lessor's written acknowledgment of receipt of payment.

11. Upon Alcoa's request, United shall procure abstracts of title to the properties leased pursuant to Article 5 hereof, deliver these abstracts to title examiners designated by Alcoa, and assist in work reasonably necessary to curing any and all defects in the title to these properties.

12. Whenever Alcoa shall so request, United shall cause the optioned or leased properties to be properly drilled on approximately one-half mile centers and shall cause the cores to be examined and logged by a competent consulting engineer. United shall cause the coal samples to be analyzed by Commercial Testing Laboratory in Chicago, Illinois and shall promptly deliver to Alcoa the results of such analysis.

13. Unless otherwise notified by Alcoa, United shall take such steps as are necessary to exercising the options immediately prior to their

respective expirations and to taking good title of record to the coal and other interests previously optioned. In connection with the performance of this work, United hereby agrees to perform, upon Alcoa's request, such other work as is necessary or convenient to carrying out these purposes, such as but not necessarily limited to the procuring of abstracts, the delivering of these abstracts to title examiners designated by Alcoa, and the assisting in work reasonably necessary to cure any and all title defects. Thereafter, United shall convey these interests so obtained to Alcoa by deeds of special warranty without recording said deeds.

14. After United has conveyed the titles or assigned the leases to Alcoa as provided herein, United agrees that it shall continue to act as if it were the owner of all these interests so conveyed or so assigned until otherwise notified by Alcoa. In accordance with the foregoing it shall manage the properties, list the properties for taxes with the appropriate authorities, pay all taxes and charges accruing with respect thereto, and take any and all other steps as are reasonably incident to the ownership of the property and necessary to the maintenance of good title thereto.

15. Upon United's receiving notice of an application for a permit to prospect for oil and gas through any of the properties covered by this AGREEMENT, or on the surface above these properties, it promptly shall so notify Alcoa. Thereafter, United shall take such action with respect to preventing the issuance of a drilling permit to the applicant as Alcoa shall request.

16. On or before the tenth day of each month, United shall invoice Alcoa for, and Alcoa shall thereafter promptly pay, such charges as shall be due and owing to United by Alcoa on account of performance hereunder by United during the previous month. Such charges shall consist of the following:

A. Payments made by United to the optionor or optionors

pursuant to the provisions of Articles 3, 9, and 13 hereof;

B. Payments made by United to the lessor or lessors pursuant to the provisions of Articles 5 and 10 hereof;

C. Payments made by United for salaries and wages of persons employed by United solely for the purpose of performing the agreements contained in Articles 3 and 4 hereof;

D. Payments made by United for fees in connection with the recording of options and leases pursuant to Article 6 hereof, and with the recording of deeds pursuant to Article 13 hereof;

E. Payments made by United to satisfy obligations imposed with respect to the properties held in accordance with Article 14, including but not necessarily limited to taxes and assessments imposed thereon;

F. Payments made by United for fees in connection with objecting to the issuance of a permit to drill for oil and gas through the properties covered by this AGREEMENT, or on the surface above these properties, as may arise pursuant to the provisions of Article 15 hereof;

G. An amount which is equal to one and one-half times the portion of the salaries of United's engineering and land acquisition employees which is attributable to United's performance of the agreements contained in this AGREEMENT on the basis of actual time spent by such employees in performance thereof;

H. The actual cost to United of drilling, examination and logging of cores, and analysis of samples performed pursuant to Article 12 hereof; and the actual cost of procuring such abstracts as shall be purchased by United pursuant to Articles 11 and 13 hereof;

I. Expenses incurred for meals, lodging, transportation, telephone and telegraph messages, engineering supplies and office supplies.

17. United shall, upon being so notified by Alcoa at any time, immediately cease, or temporarily suspend, the obtaining of either options, or leases, or both, pursuant to this AGREEMENT.

18. This AGREEMENT may be terminated by either United or Alcoa by giving thirty (30) days prior written notice of such termination.

19. In the event Alcoa decides not to extend any of the options, or not to exercise any of these options, or to abandon any of the leases acquired under this AGREEMENT, the said options or leases shall at the election of United be reassigned by Alcoa to United upon the reimbursement by United to Alcoa of all charges theretofore paid by Alcoa to United with respect thereto as provided in either Article 16 hereof or Article 6 of the Agreement dated September 5, 1956, or both, plus any payments made on any of said properties by Alcoa prior to September 5, 1956.

20. United has previously obtained and assigned to Alcoa certain options enumerated and described on Schedule A, attached hereto, covering lands lying only partly within the area outlined in red on Exhibit A. As to the options shown on Schedule A, notwithstanding anything to the contrary in other Articles of this AGREEMENT, United and Alcoa agree as follows:

(a) Alcoa shall reassign to United the options shown on

Schedule A, and United shall hold each such option and cause it to be renewed, assigned, exercised or allowed to expire as herein provided.

(b) Until otherwise agreed to in writing by United and Alcoa, United shall cause each option shown on Schedule A to be kept in force by timely giving all renewal notices and paying all renewal charges therein allowed or required. When any such option is renewed and renewal charges have been paid by United as herein provided, United shall give Alcoa notice thereof, and Alcoa shall reimburse United for Alcoa's share of such renewal charges, which share is agreed to be the amount shown under "Alcoa Renewal Cost/Year" on Schedule A.

(c) If at any time either United or Alcoa shall desire that any such option be allowed to expire, it shall so notify the other in writing and the party receiving such notice shall, within 10 days thereof, in writing, notify the party giving such notice whether it agrees with or dissents from allowing such option to expire.

(1) If the notices of United and Alcoa agree that such option be allowed to expire, no renewal payment shall be made and the option shall be allowed to expire.

(2) If Alcoa gives United notice that Alcoa desires that such option be allowed to expire and United gives Alcoa notice that United dissents from allowing such option to expire, all rights of Alcoa in and to such option shall terminate and United shall thereafter hold such option for its sole account

and shall reimburse Alcoa for all option payments and renewal payments relating to such option for which Alcoa has reimbursed United pursuant to this agreement or pursuant to the agreement of September 5, 1958.

(3) If United gives Alcoa notice that United desires that such option be allowed to expire and Alcoa gives United notice that Alcoa dissents from allowing such option to expire, United shall cause such option to be renewed by timely giving all renewal notices and paying all renewal charges therein allowed or required. Forthwith after such renewal United shall assign such option to Alcoa and Alcoa shall reimburse United for the renewal payment made pursuant to the preceding sentence and for all option payments and renewal payments theretofore made by United on account of such option for which Alcoa has not reimbursed United.

(d) If, during the term, or any renewal term, of any option shown on Schedule A, either United or Alcoa shall desire the exercise of such option, it shall so notify the other, in writing, and the party receiving such notice shall, within 10 days thereof, in writing, notify the party giving such notice whether it agrees with or dissents from such exercise.

(1) If the party receiving notice agrees with the exercise, United shall proceed to exercise the option and complete the purchase of the land described therein. Promptly after the conveyance to United of the land

described in such option, United shall, by deed of general warranty, convey to Alcoa that portion of said land shown under "Alcoa Area Description" on Schedule A and Alcoa shall reimburse United for the purchase price paid by United for such portion.

(2) If the party receiving the notice dissents from the exercise, United shall proceed to exercise the option and complete the purchase of the land described therein. If the option is exercised and the land purchased at the instance of United and without the assent of Alcoa, United shall acquire and hold the land at its sole expense and for its own account and shall reimburse Alcoa for all option payments and renewal payments relating to such option for which Alcoa has reimbursed United pursuant to the aforementioned agreement of September 5, 1956, or pursuant to this agreement. If the option is exercised and the land purchased at the instance of Alcoa, and without the assent of United, United shall, by deed of general warranty, promptly convey the land described in such option to Alcoa, and Alcoa shall reimburse United the total purchase price now provided in such option less the total of all option payments and renewal payments relating to such option for which Alcoa has reimbursed United pursuant to the aforementioned agreement of September 5, 1956, or pursuant to this agreement.

21. All notices and requests provided for in this AGREEMENT shall be in writing. Notices to United shall be deemed to be properly given

when deposited in the United States mail, registered and postage prepaid, addressed to:

G. H. Utterback
Secretary-Treasurer
The United Electric Coal Companies
307 North Michigan Avenue
Chicago, Illinois 60601

Notices to Alcoa shall be deemed to be properly given when deposited in the United States mail, registered and postage prepaid, addressed to:

R. S. Overbeck
Aluminum Company of America
1501 Alcoa Building
Pittsburgh, Pennsylvania 15219

22. This AGREEMENT shall inure to the benefit of and shall be binding upon the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF the parties hereto have caused this AGREEMENT to be executed by their duly authorized officers.

Attest: THE UNITED ELECTRIC COAL COMPANIES

Secretary By President

Attest: ALUMINUM COMPANY OF AMERICA

Asst. Secretary By Vice President

State of Illinois)
) ss.
County of Cook)

I, G. A. Alderson, a Notary Public, do hereby certify that on the 17th day of May, 19 65, J. M. Harris, President and G. H. Whitebrook, Secretary, personally appeared before me and being first duly sworn by me severally acknowledged that they signed the foregoing document in the respective capacities therein set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the day and year before written.

(Seal)

G. A. Alderson
Notary Public

My commission expires April 12, 1969

COMMONWEALTH of)
Pennsylvania) ss.
County of Allegheny)

I, Wendy L. Richardson, do hereby certify that on the 11th day of May, 1965, H. J. Morrison, Vice President, and Alfred M. Hunt, Secretary, personally appeared before me and being first duly sworn by me severally acknowledged that they signed the foregoing document in the respective capacities therein set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the day and year before written.

(Seal)

Wendy L. Richardson

WENDY L. RICHARDSON, Notary Public
Pittsburgh, Allegheny County, Penna.
My Commission Expires
April 2, 1969

SCHEDULE A

UNDERGROUND COAL OPTIONS - BEAUCOUP & ROUND PRAIRIE FIELDS - PART ALCOA AREA PART UNITED ELECTRIC AREA

Option No.	Optionor	Alcoa Acres	U.E. Acres	Alcoa Renewal Cost/Year	U.E. Renewal Cost/Year	Alcoa Area Description	U. E. Area Description
134X	Louis, B. H.	40	40	$ 40	$ 40	NE 1/4, NW 1/4 Sec. 17-4S-2W	SE 1/4, SW 1/4 Sec. 8-4S-2W
123X	Thompson, L.	130	20	130	20	SW 1/4, NW 1/4 except for 10 acres in SE Cor., and NE 1/4 SW 1/4 Sec. 16-4S-2W, NW 1/4 NE 1/4 and N 1/2 of NE 1/4 NE 1/4 Sec. 17-4S-2W	W 1/2 SE 1/ SE 1/4 Sec. 8-4S-2W
127X	Walrath, E.C.	90	40	90	40	Und. 1/2 Int. NE 1/4 SE 1/4, SE 1/4 NE 1/4 and S 1/2 NE 1/4 NE 1/4 Sec. 17-4S-2W, and NW 1/4 SW 1/4 Sec. 16-4S-2W	SE 1/4 SW 1/4 Sec 9-4S-2W
138	Bronke, J. F.	40	40	40	40	SE 1/4 NE 1/4 Sec. 14-4S-2W	SE 1/4 SW 1/4 Sec. 11-4S-2W
115X	Gass, D.	40	40	40	40	SW 1/4 NE 1/4 Sec. 18-4S-2W	E 1/2, SE 1/4 SE 1/4 and S 1/2 NE 1/4 SE 1/4

1711

MORRIS DEPOSITION
EXHIBIT 62

MY-62 3147Rt
ORIG
GR Morris file

THE UNITED ELECTRIC COAL COMPANIES

307 NORTH MICHIGAN AVENUE

CHICAGO 1, ILLINOIS

J. H. MORRIS
PRESIDENT

September 12, 1960

Mr. Frank Bogont, President
Freeman Coal Mining Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Frank:

Enclosed is copy of letter from Ray Miller of Alcoa which I thought you would like to see.

In line with our recent discussion, it appears worth while to make a study of possible investment and cost per ton that might be achieved in an underground mine on the coal acreage that has been acquired by the Aluminum Company.

There is, of course, no hurry about this but whenever you would like to do it, please let us know what information is needed and we will supply it.

With kindest regards,

Yours very truly,

Johnnie

JHM:EM

GOVERNMENT EXHIBIT
Mor. Dep.
70

June 11, 1962

Morris Dep. Ex. 70
CBS 10-1-68

Mr. Francis Stanley Jordan
37 Jefferson Avenue
Short Hills, New Jersey

Dear Mr. Jordan:

This will acknowledge yours of June 7. Permit me to welcome you as a stockholder in our company and we appreciate your interest as expressed concerning recommending the purchase of United Electric stock for some others.

For our fiscal year ended July 31, 1961, approximately 62% of our sales was to the utilities. For our current year ending July 31, 1962, we anticipate this will increase to 70% or maybe slightly more.

We continue to share in the growth of the utility industry. Most of our utility customers are under long-term contracts with us, varying in number of years. All of these contracts carry escalation clauses covering changes in wage rates, costs of materials and supplies, hours of work per day or week, and changes in Federal or State laws having a direct effect on production costs.

We do not have any serious competition in the Midwest from oil for use in industrial and utility plants. We do have severe competition from natural gas when it is dumped at low prices during the summer months when there is no heating load. We feel, however, that with our mining methods and transportation costs, we can continue to hold our position with this competition. It is expected that with the diminishing reserves of gas and the possible higher prices, our competitive relationship with this fuel will improve.

We are glad to hear from you and if any further information is desired, please call on us.

Sincerely,

JCC:EF

6139

GOVERNMENT EXHIBIT Mor. Dep. 76

GOVERNMENT EXHIBIT Tar. Dep. 10

February 15, 1951

Mr. J. H. Taylor

Re: Illinois Power, Vermilion-Danville Power Plant

In recent discussions with Arch Krambrik, he mentioned that they are seriously considering the matter of stripping the coal that they own adjacent to their Vermilion power plants.

He stated that they have estimated that there is 6,000,000 tons that could be strippable in this area and that Armstrong had made them a proposition to strip this coal [illegible] them at a certain cost and deliver it to their power [illegible].

Arch recalled that we went into this situation some time ago and he would like to have us renew our efforts along those lines and come up with a cost and delivered figure for them to this coal.

I have mentioned this to Mr. Rayburn and I am sure [illegible] will want to discuss it with him on your return to the [illegible] and then contact Arch about it.

D. J. Payne

DJP:rh

cc - Mr. R. V. Rayburn

COPY

1715

Dix -1 Ex. 1, Id 4/14/69 D

GENERAL SERVICES ADMINISTRATION
FEDERAL SUPPLY SERVICE

TERM CONTRACT ORDERING DATA FOR:

FSC Group 91 Fuels
FSC Class 9110 — Coal

Veterans Administration Facilities
(Schedule 1)

&

Federal Public Buildings
(Schedule 2)

Within the states of:
Illinois, Indiana, Kentucky, Michigan, Ohio & Wisconsin

GEOGRAPHIC COVERAGE:

Effective Period:
Date of Award through June 30, 1968

IMPORTANT NOTICE

In addition to the "Special Provisions" below, Contractors listed herein are subject to the provisions of the following forms, which are a part of the Contract:

(a) General Provisions (Supply Contract) Standard Form 32, June 1964 Edition.

(b) Standard Form 33 & 33A, December 1964 Edition.

(c) Supplemental Provisions, GSA Form 1424, September 1964 Edition.

(d) PS Form T288, October 1965 "Equal Opportunity."

(e) Special Provisions Applicable to Coal Contracts dated March 9, 1951.

SCOPE OF CONTRACT

This schedule provides for the normal supply requirements of the installations specified herein, and contracts will be used as primary sources for the articles or services listed herein. Articles or services will be ordered from time to time in such quantities as may be needed. As it is impossible to determine the precise quantities of different kinds of articles and services described in the schedule that will be needed during the contract term, each Contractor will be obligated to deliver all articles and services of the kinds contracted for that may be ordered during the contract term, EXCEPT:

(a) EXIGENCIES: In cases of exigency. (Subject to audit by the General Accounting Office.)

(b) URGENT REQUIREMENTS: To the extent that a contractor is unable to meet the bona fide delivery requirements of ordering activities STIPULATING DELIVERIES SHORTER THAN THE CONTRACT DELIVERY TIME. Delivery requirements are defined as actual needs of the ordering office which require the articles or services must be delivered in the total quantity required by the date required. When the contract delivery time does not meet delivery requirements and the ordering activity determines that time permits, the Contractor shall be requested by letter, telegram or telephone (confirmed in writing) to state the best delivery time of which he is then capable. The Contractor shall reply to such inquiries in kind not more than 3 working days after receipt. Orders placed on the basis of a shorter delivery time agreed to shall be delivered within this shorter delivery time and in accordance with all other terms and conditions of the contract.

SPECIAL REQUIREMENTS

Where an agency included under Scope of Contract Provision finds that the specific articles or services listed herein will not meet a special requirement, articles or services having the same general characteristics needed to meet the special requirement may be procured: Provided, that a prior written waiver of the requirement for using this schedule is obtained from the General Services Administration. Requests for such waivers shall be submitted to the contracting office at the address shown on the face of the Schedule. Such requests shall (a) describe the pertinent differences between the articles or services listed herein and those required, (b) specify the quantities required, and (c) state the reasons why the articles or services listed herein will not meet the requirement.

(Continued)

SUPPLEMENTAL & SPECIAL PROVISIONS

PURCHASE ORDERS: Purchase or delivery orders will be issued to the coal contractor by the activity concerned in accordance with the schedule. Upon receipt of a purchase or delivery order, the contractor shall furnish the coal specified in the schedule in accordance with the provisions of the contract and in compliance with the instructions set forth in the order. The order should indicate to which office the contractor's invoices are to be submitted for payment. If the coal is to be shipped in a certain type of railroad car or delivered by a designated railroad to a particular yard or siding, such information should be furnished the contractor.

RAIL DELIVERIES: When necessary to meet unloading conditions, the government reserves the right to require shipments to be made in the type of transportation equipment it may specify and to reject shipments proffered in other types of equipment.

PRICES: (a) Prices "FOB MINE (CARS)" -Free on Board Cars, at the mine or at the water front dock.
(b) Prices "FOB DESTINATION (Tracks)" - Includes transportation costs to rail siding at destination. Drayage from railroad siding to bin to be arranged by ordering office.
(c) Prices "DELIVERED INTO BINS" - Includes delivery into the bins at the using activity without additional cost to the government.

Seller's Invoices: Paragraph 11 of Standard Form 33-A is hereby corrected to read "Invoices shall be prepared and submitted in original only, etc.," in lieu of "in Quarduplicate." The rest of the paragraph remains the same.

SPECIFICATION:
The Federal Activity and destination (delivery), the size of coal, the analytical constituents (limits) and estimated tonnage, by item numbers, are given in the Schedule. The sizes specified are based on round hold screen. Unless otherwise specifically stated for an item, the coal is for use as fuel in heating or steam generating plants. Coal which is unduly friable, oxidized, non-caking or non-coking, will not be acceptable.

SUPPLEMENTS TO SPECIAL PROVISIONS APPLICABLE TO COAL CONTRACTS DATED MARCH 9, 1951.

"PRICE REVISION - OTHER THAN RETAIL" - Paragraph 10 is supplemented as follows:

"The aggregate of the increases in any unit price made under this paragraph shall not exceed 10 percent of the original applicable price."

"PRICE REVISION - RETAIL - Paragraph 11 is supplemented as follows:

"The aggregate of the increases in any unit price made under this paragraph shall not exceed 10 percent of the original applicable price."

"VARIATION OF TONNAGE" - Paragraph 12 is supplemented as follows:

"Unless otherwise specified, any variation in the quantities called for in any order, not exceeding 10 percent, will be accepted when caused by conditions of loading or shipping."

(Continued)

VETERANS ADMINISTRATION FACILITIES

(SCHEDULE NO. 1)

ADDITIONAL REQUIREMENTS AND SPECIFICATIONS

Contractors who received awards on a delivered and stored basis will be required to place the coal on the stockpile or into coal hoppers as required by the installation.

On awards made f.o.b. mine, movement by rail will be made on commercial bills of lading, which will be converted to Government bills of lading at destination. Further instructions will be furnished in notices of acceptance and in purchase orders placed under the contracts.

(Continued)

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	ILLINOIS				
1.	Vet. Adm., Danville, Ill. 1900 E. Main St.	520 Tons – Aug. 610 " – Sept. 965 " – Oct. 1155 " – Nov. 1385 " – Dec. 1900 " – Jan. 1575 " – Feb. 1375 " – Mar. 1050 " – Apr. 625 " – May 550 " – June 11710 " Total	3/4" x 1/4" FSI – No. 5 Max. Moisture as Received – 14.0% Max. Volatile, Dry – (No Limit) Ash, Dry - 6.0% Min. – 12.0% Max. Sulphur, Dry – 3.1% Max. B.T.U., Dry 12,800 Min. A.S.T. 2,000°F Min. STRICTLY ADHERE TO SIZE	$6.00 Bin Delivered	Frontenac Coal Corp.

(Exception to Para. 4C of Special Provisions, Applicable to Coal Contracts – ALL TRUCK DELIVERIES WILL BE WEIGHED ON GOV'T OWNED SCALES AND WEIGHTS SO DETERMINED; SHALL BE BASIS OF SETTLEMENT.)

(Continued)

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
2.	ILLINOIS (Cont'd) Vet. Adm., Hines, Ill. Bldg. 142, West Broadview, Ill. Delivering Carrier IC RR. Triple Hopper Cars Required Activity has its own siding. Suggested Routings FOB Mine Shipment AWW – SOU – IC AWW – SOU – MONON – IC Dely. AWW – SOU – C & EI – IC Dely. AWW – NYC SYSTEM – IC Dely. AWW – SOU – PRR – IC Dely. SOU – MONON – IC Dely. Frt. Rate: $3.07 (1000 Tons) Per Ton $3.57 (Single Car) Per Ton OIL TREATMENT REQUIRED DURING MONTHS OF NOVEMBER, DECEMBER	1100 Tons – Aug. 1100 " – Sept. 2300 " – Oct. 3400 " – Nov. 4400 " – Dec. 12300 " Total	1-1/4" x 1/4" Stoker – Firm Moisture As Received – 12.0% Max Volatile Dry (No Limit) " Ash, Dry – 10.0% " Sulphur, Dry 3.6% " B.T.U., Dry 12,900 Min. A.S.T. 2,100°F Min.	$4.35 Mine	Knox Coal
3.	Vet. Adm., Marion, Ill. Activity does not have its own siding. Bin Capacity – 200 tons	170 Tons – Oct. 250 " – Nov. 300 " – Dec. 320 " – Jan. 290 " – Feb. 290 " – Mar. 200 " – Apr. 100 " – May 1,920 " Total	1" x 10" Mesh 25% Maximum thru 1/4" Round Hole Screen Oil Treated Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 2.0% " B.T.U., Dry 12,800 Min. A.S.T. 2100°F	$5.55 Bin Delivered	Bell & Zoller Coal Co.

(Continued)

1720

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	INDIANA				
4.	Vet. Adm., Marion, Ind. 38th St., Home Ave. (Host. Siding)	600 Tons – Aug. 1900 " – Sept. 2000 " – Oct.	1" x 1/4" Oil Treated Moisture as Received – 12.0% Max.	$4.40 Mine	Enos Coal Sales Div.
	Open Storage – Unlimited Capacity	2000 " – Nov. 500 " – Dec.	Volatile, Dry (No Limit) Ash, Dry – 12.0% "		
	Activity has its own siding Hopper Cars Required Delivering Carrier, NYC RR Rail Delivery	1200 " – Mar. 1000 " – Apr. 800 " – May 500 " – June	Sulphur, Dry – 4.0% " B.T.U., Dry 12,600 Min. A.S.T. 2,050°F "		
	Suggested Routings FOB Mine Shipment AWW – NYC AWW – NYC – N & W	10,500 " Total			
	Frt. Rate: $2.88 Per Ton				
	KENTUCKY				
5.	Vet. Adm., Lexington, Ky. 569 S. Broadway, Southern RR 600 West Vine & Patterson Sts. L&N RR 123 Rose St., C&O RR	350 Tons – Aug. 350 " – Sept. 550 " – Oct. 600 " – Nov. 650 " – Dec. 750 " – Jan.	1-1/4" x 1/4" Oil Treated	$10.09 Bin Delivered	Scotia Coal Co.
	Activity does not have its own siding. Bin capacity – 250 tons; outside storage lot – concrete slab – 2000 tons capacity	650 " – Feb. 700 " – Mar. 500 " – April 500 " – May 350 " – June	Moisture as Received – 6.0% Max. Volatile, Dry (No Limit) Ash, Dry – 8.0% "		
		5,950 " Total	Sulphur, Dry – 1.5% " B.T.U., Dry 13,600 Min. A.S.T. 2,400°F "		

(Continued)

1721

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	
	KENTUCKY (Cont'd)				
6.	Vet. Adm., Louisville, Ky. Zorn & Mellwood Activity does not have its own siding. Bin capacity 165 tons	350 Tons – Oct. 350 " – Nov. 450 " – Dec. 500 " – Jan. 400 " – Feb. 400 " – Mar. 350 " – Apr. 350 " – May 300 " – June 3,450 " Total	3/4 x 28 M Not exceeding 25% thru ¼" Round Hole Screen Moisture – 8.0% Max. Volatile, Dry (No Limit) Ash, Dry – 8.0% Max. Sulphur, Dry – 3.5% Max. B.T.U., Dry 13,000 Min. A.S.T. 2,100°F Min.	$7.69 Bin Delivered	*Charles Buddeke Coal Co.
7.	Vet. Adm., Ft. Thomas, Ky. 29 Bin capacity – 652 tons Outside coal pile capacity – 300 tons. Activity does not have its own siding.	28 Tons – July 178 " – Aug. 153 " – Sept. 70 " – Oct. 141 " – Nov. 173 " – Dec. 171 " – Jan. 141 " – Feb. 127 " – Mar. 35 " – April 35 " – May 28 " – June 1,280 Total	1" x 1/4" Oil Treated Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 1.5% " B.T.U., Dry 13,700 Min. A.S.T. 2,200°F "	$10.35 Bin Delivered	Atlas Coal & Blacktop

Truck delivery to storage points located at approximately 30 locations. Contractor should maintain a reserve supply sufficient to make deliveries as required.

ORDERS FOR THIS STATION WILL BE PLACED BY THE VA HOSPITAL, CINCINNATI, OHIO

(Continued)

1722

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	MICHIGAN				
8.	Vet. Adm., Ann Arbor, Michigan 2215 Fuller Road (Ann Arbor & NYC RR) No rail siding at activity. Inside overhead bunker. Capacity 150 Tons Outside concrete storage capacity - 900 Tons	200 Tons – Oct. 350 " – Nov. 425 " – Dec. 490 " – Jan 450 " – Feb. 400 " – Mar. 275 " – Apr. 200 " – May 2,790 " Total	1-1/4" x 1/4" Stoker Oil Treated Moisture as Received – 5.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 2.0% " B.T.U., Dry 13,800 Min. A.S.T. 2,400°F "	$11.27 Bin Delivered Guyan #1	Island Creek Coal Sales Co.
9.	Vet. Adm., Battle Creek, Mich. Ft. Custer, Battle Creek, Mich. (Delivery–carrier NYC RR) Coal silo capacity – 250 Tons Yard storage capacity – 7,000 Tons Rail delivery 50-70 Ton Hopper bottom cars required. Activity has its own siding. Suggested Routings FOB Mine Shipment C & O – NYC C & O – AA – NYC C & O – NYC (M) Frt. Rate: $4.97 Per Ton	1000 Tons – July 1000 " – Aug. 1000 " – Sept. 1000 " – Oct. 1000 " – Nov. 1000 " – Dec. 1000 " – Jan. 1000 " – Feb. 1000 " – Mar. 1000 " – Apr. 500 " – May 10,500 " Total	1-1/4" x 1/4" Stoker Oil Treated Moisture as Received – 6.0% Max. Volatile, Dry (No Limit) Ash, Dry – 7.0% " Sulphur, Dry – 2.0% " B.T.U., Dry 13,700 Min. A.S.T. 2,400°F "	$5.45 Mine Guyan #1	Island Creek Coal Sales Co.

(Continued)

1728

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	MICHIGAN (Cont'd)				
10.	Vet. Adm., Iron Mountain, Mich (Delivery carrier – Milwaukee RR) Bin capacity – 200 tons Outside concrete platform capacity. Activity has its own siding.	191 Tons – Aug. 211 " – Sept. 246 " – Oct. 314 " – Nov. 437 " – Dec. 500 " – Jan. 420 " – Feb. 385 " – Mar. 310 " – April 270 " – May 207 " – June 3,491 " Total	1" x 1/4" Moisture as Received – 8.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 1.7% " B.T.U., Dry 13,300 Min. A.S.T. 2,400°F. "	$12.60 Bin Delivered	C. Reiss Coal Co.
11.	Vet. Adm., Saginaw, Mich. Weiss Street Team Track, Saginaw, Mich. (C & O – PM or GTW RR) Coal silo capacity – 230 Tons Activity does not have its own siding.	200 Tons – Nov. 100 " – Dec. 300 " – Jan. 300 " – Feb. 50 " – Mar. 950 " Total	1-1/4" x 1/4" Oil Treated Moisture as Received – 5.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 1.5% " B.T.U., Dry 13,800 Min. A.S.T. 2,400°F "	$13.22 Bin Delivered Guyan #1	Island Creek Coal Sales Co.

1724

(Continued)

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	OHIO				
12.	Vet. Adm., Brookville, Ohio (New Hospital) 10000 Brookville Road Brookville, Ohio Delivering Carrier – B & O Bin capacity – 80 Tons Coal yard capacity – 3000 Tons Activity does not have its own siding. Truck Delivery.	400 Tons – Aug. 480 " – Sept. 680 " – Oct. 930 " – Nov. 1250 " – Dec. 1350 " – Jan. 1325 " – Feb. 1100 " – Mar. 950 " – Apr. 625 " – May 480 " – June 9,570 " Total	1" x 3/8" Free Swelling Index #5 Max. Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 6.0% Min. – 12.0% Max. Sulphur, Dry – 2.9% " B.T.U., Dry 13,000 Min. A.S.T. 2,150°F "	$7.70 Bin	Midvale Coal Co.
13.	Vet. Adm., Chillicothe, Ohio Delivery carrier B & O RR Hopper cars required Rail Delivery only Activity has its own siding. Outside storage – unlimited capacity. Suggested Routings FOB Mine Shipment C & O – B & O Dely. Frt. Rate: $3.29 Per Ton	300 Tons – July 300 " – Aug. 500 " – Sept. 800 " – Oct. 1000 " – Nov. 1000 " – Dec. 1200 " – Jan. 1200 " – Feb. 1100 " – Mar. 900 " – April 500 " – May 400 " – June 9,200 " Total	1-1/4" x 1/4" Stoker Oil Treated During Months of November, December, January, February, March and April Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 1.5% " B.T.U., Dry 12,800 Min. A.S.T. 2,100°F "	$5.25 Mine Guyan #1 $5.45 for Oil Treatment	Island Creek Coal Sales Co.

(Continued)

1726

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	
	OHIO (Cont'd)				
14.	Vet. Adm., Cincinnati, Ohio Melish Ave. Team Track RR, Brighton Sta. Cincinnati, Ohio (B & O RR) Bin capacity – 250 Tons Activity does not have its own siding. Bin is fed by outside hopper and conveyor.	660 Tons – July 690 " – Aug. 650 " – Sept. 360 " – Oct. 570 " – Nov. 615 " – Dec. 606 " – Jan. 650 " – Feb. 592 " – Mar. 530 " – Apr. 618 " – May 647 " – June 7,188 " Total	1-1/4" x 0" Not more than 25% passing through a 1/4" round hole screen. Oil treated. Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 1.5% " B.T.U., Dry 13,700 Min. A.S.T. 2,200°F "	$8.86 Bin Delivered	Island Creek Coal Sales Co.
15.	Vet. Adm., Dayton, Ohio (National Military Home) 4100 W. Third Street Via Dayton, Ohio B&O RR Activity has its own siding. Storage yard capacity – 6000 tons.	2500 Tons – Oct. 1000 " – Nov. 2000 " – Dec. 2000 " – Jan. 1000 " – Feb. 1000 " – Mar. 1000 " – April 1000 " – May 11,500 " Total	1" x 3/8" Free Swelling Index 5 Max. Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 6.0% Min. 12.0% Max. Sulphur, Dry – 3.5% " B.T.U., Dry 13,000 Min. A.S.T. 2,150°F. "	$7.20 Cars Destination	Peabody Coal Co.

DELIVERY REQUIRED BY RAIL IN HOPPER BOTTOM CARS

(Continued)

1726

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	WISCONSIN				
16.	Vet. Adm., Madison, Wisconsin (CMSTP&P RR Delivery) Hopper bottom cars required. Activity has its own siding.	186 Tons – July 182 " – Aug. 195 " – Sept. 343 " – Oct. 372 " – Nov. 527 " – Dec. 589 " – Jan. 511 " – Feb. 485 " – Mar. 350 " – April 273 " – May 220 " – June 4,243 " Total	1" x 1/4" Moisture as Received – 6.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 2.0% " B.T.U., Dry 13,600 Min. A.S.T. 2,400°F "	$12.34 Cars Destination	Great Lakes Coal & Dock
	Coal for this station desired delivery from docks at Milwaukee, Wisconsin				
17.	Vet. Adm., Tomah, Wisconsin Activity does not have its own siding. Bin capacity – 275 Tons Hard standing – 2000 Tons Delivery by truck is required with weekly deliveries approximating 1/6 of month requirements.	320 Tons – July 340 " – Aug. 430 " – Sept. 600 " – Oct. 800 " – Nov. 1000 " – Dec. 1180 " – Jan. 1020 " – Feb. 970 " – Mar. 710 " – Apr. 490 " – May 340 " – June 8,300 " Total	1" x 1/4" Oil Treated Moisture as Received – 10.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 3.0% " B.T.U., Dry 12,800 Min. A.S.T. 2,200°F "	$10.60	Great Lakes Coal & Dock Company

(Continued)

1727

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	WISCONSIN (Cont'd)				
18.	Vet. Adm., Wood, Wisconsin Bin capacity – 520 Tons Activity does not have its own siding. Delivery by truck is required. Necessary to maintain at all times a reserve supply of not less than 3500 tons of screenings.	275 Tons – July 275 " – Aug. 350 " – Sept. 600 " – Oct. 875 " – Nov. 1075 " – Dec. 1125 " – Jan. 1050 " – Feb. 1050 " – Mar. 750 " – Apr. 500 " – May 375 " – June 8,300 " Total	3/4" x 0 Slack Moisture as Received – 6.0% Max. Volatile, Dry (No Limit) Ash, Dry – 10.0% " Sulphur, Dry – 1.0% " B.T.U., Dry 13,600 Min. A.S.T. 2,200°F "	$14.05 Bin Delivered	Schneider Fuel & Supply

1728

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	ILLINOIS				
19.	Chicago, Illinois, GSA, PBS The U.S. Courthouse and Federal Office Building (New) 219 S. Dearborn St. Bin capacity – Two (2) –90 tons ea. Activity does not have its own siding.	100 Tons – Oct. 750 " – Nov. 1000 " – Dec. 1200 " – Jan. 1200 " – Feb. 1000 " – Mar. 300 " – Apr. 5,550 " Total	3/4" Mesh Washed Screenings Moisture as Received – 9.8% Max. Volatile, Dry – 40.2% " Ash, Dry – 8.4% " Sulphur, Dry – 2.2% " B.T.U., Dry 13,420 Min. A.S.T. 2,130°F "	$10.49 Bin Delivered	Dunn Coal & Oil Co.
20.	U.S. Dept. of the Interior Fish & Wildlife Service Crab Orchard National Wildlife Refuge, Route #2, Carterville, Ill. Delivery to Ordill, Ill. Due to road and bridge limitations, 10-ton max. capacity is permitted per truckload. Deliveries can be made Mondays through Saturdays inclusive, and unloaded directly into storage bins. Washing process to be accomplished prior to crushing and final sizing. Suppliers storage facilities to be adequate to prevent precipitation moisture following processing and prior to delivery.	50 Tons – Oct. 70 " – Nov. 100 " – Dec. 100 " – Jan. 70 " – Feb. 60 " – Mar. 50 " – April 500 " Total Bin delivery required Bin capacity 30 tons (4 bins) Truck Delivery only.	3/4" x 1/4" Mesh washed and oil treated stoker Moisture as Received – 7.0% Max. Volatile, Dry – 40.0% " Ash, Dry – 10.0% " Sulphur, Dry – 2.75% " B.T.U., Dry 12,000 Min. A.S.T. (Unknown)	$6.30 Bin Delivered	Freeman Coal Mining Corp.

(Continued)

1729

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	ILLINOIS (Cont'd)				
21.	Marion, Illinois, Dept. of Justice, United States Penitentiary Activity does not have own siding. Bin capacity – 450 tons. Bin delivery required by truck.	125 Tons – Aug. 150 " – Sept. 250 " – Oct. 350 " – Nov. 480 " – Dec. 500 " – Jan. 525 " – Feb. 425 " – Mar. 325 " – April 250 " – May 125 " – June 3,530 " Total	3/4" x 28 Mesh, Small Stoker Washed Free Swelling Index No. 6 Max. Moisture as Received – 9.0% Max. Volatile, Dry – 40.0% " Ash, Dry – 10.6% " Sulphur, Dry – 2.9% " B.T.U., Dry 11,760 Min. A.S.T. 2,150°F "	$5.70 Bin Delivered	Freeman Coal Mining Corp.
	INDIANA				
22.	Hammond, Indiana, GSA, Defense Materials Service, Hammond Depot, for use at Tank Farm. Silo capacity – 50 tons Ground storage capacity – 50 tons Activity does not have its own siding. Bin delivery required by truck.	50 Tons – Sept. 100 " – Oct. 100 " – Nov. 100 " – Dec. 100 " – Jan. 100 " – Feb. 50 " – Mar. 50 " – April 50 " – May 700 " Total	1-1/2" x 1/4" Washed nut Stoker, with mixture as follows: 1-1/2 – 3/4 – 44% 3/4 – 3/8 – 36% 3/8 – 1/4 – 20% Moisture as Received – 11.0% Max. Volatile, Dry – 44.0% " Ash, Dry – 10.0% " Sulphur, Dry – 3.0% " B.T.U., Dry 13,252 Min. A.S.T. 2,220°F "	$10.60 Bin Delivered	Hefter Coal & Oil Co.

(Continued)

1780

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	INDIANA (Cont'd)				
23.	Jeffersonville, Indiana, GSA, PBS Jeffersonville Depot Delivery carrier – NYC Activity has its own siding. Bin capacity 800 Tons. Bin delivery required by truck.	550 Tons – Oct. 600 " – Nov. 1000 " – Dec. 1000 " – Jan. 1000 " – Feb. 970 " – Mar. 400 " – Apr. 5,520 " Total	1-1/4 x 28 mesh Washed screenings. Oil treated Moisture as received – 10.8% Max. Volatile, Dry – 45.5% " Ash, Dry – 8.8% " Sulphur, Dry – 3.9% " B.T.U., Dry 13,100 Min. A.S.T. 2,100°F "	$7.69 Bin Delivered	Acme Fuel Co. Charles Buddeke Coal Co.
24.	Terre Haute, Indiana, Dept. of Justice, United States Penitentiary Yard pile capacity – 1000 Tons Bin capacity – 300 Tons. Bin delivery required. Truck delivery only.	1480 Tons – July 480 " – Aug. 480 " – Sept. 480 " – Oct. 1080 " – Nov. 1080 " – Dec. 1080 " – Jan. 1080 " – Feb. 900 " – Mar. 860 " – Apr. 9,000 " Total	1-1/4" x 28" mesh. Not to exceed 20% Fines Moisture as Received – 20.0% Max. Volatile, Dry – 44.0% " Ash, Dry – 10.0% " Sulphur, Dry – 2.0% " B.T.U., Dry 13,000 Min. A.S.T. 2,300°F "	$5.70 Bin Delivered	Peabody Coal Co.

(Continued)

1731

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	INDIANA (Cont'd)				
25.	Terre Haute, GSA DMS Depot Bin Capacity – 30 Tons Truck Delivery Only	30 Tons – Oct. 60 " – Nov. 70 " – Dec. 80 " – Jan. 60 " – Feb. 50 " – Mar. 350 " Total	1-1/4 x 1/4 Washed Stoker Analytical Limits: Moisture as Received – 9.8% Max. Volatile, Dry – 42.1% " Ash, Dry – 8.4% " Sulphur, Dry – 3.1% " B.T.U., Dry 13,000 Min. A.S.T. 2,150°F "	$7.50 Bin Delivered	Bell & Zoller
	KENTUCKY				
26.	Lexington Clinical Research Center 400 Ton bin capacity. Hopper bottom car required. Activity has its own siding. Delivering carrier Louisville & Nashville RR. Delivery Point, Narco, Fayette City,	295 Tons – Aug. 354 " – Sept. 826 " – Oct. 1062 " – Nov. 1121 " – Dec. 1180 " – Jan. 1121 " – Feb. 1062 " – Mar. 708 " – Apr. 472 " – May 295 " – June 8,496 " Total	3/4" slack Moisture as Received – 8.0% Max. Volatile, Dry – 36.0% " Ash, Dry – 10.0% " Sulphur, Dry – 2.0% " B.T.U., Dry 13,500 Min. A.S.T. 2,500°F "	$8.26 Cars Destination	Scotia Coal Co.

(Continued)

1732

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	KENTUCKY (Cont'd)				
27.	Louisville, Kentucky, GSA, PBS, 830 West Broadway Bin capacity – 30 Tons. Activity does not have its own siding.	30 Tons – Oct. 40 " – Nov. 60 " – Dec. 80 " – Jan. 80 " – Feb. 60 " – Mar. 350 " Total	1-1/2" x 28 Mesh Oil Treated Moisture – 9.8% Max. Volatile, Dry – 44.1% " Ash, Dry – 9.3% " Sulphur, Dry – 3.6% " B.T.U., Dry 13,500 Min. A.S.T. 2,080°F "	$7.69 Bin Delivered	Charles Buddeke Coal Co. "
28.	Louisville, Kentucky, GSA, PBS, 1405 West Broadway Bin capacity – 150 Tons. Activity does not have its own siding.	50 Tons – Oct. 50 " – Nov. 50 " – Dec. 100 " – Jan. 100 " – Feb. 50 " – Mar. 400 " Total	1-1/2" x 28 Mesh stoker Oil Treated. Moisture as Received – 7.5% Max. Volatile, Dry – 42.8% " Ash, Dry – 9.3% " Sulphur, Dry – 3.3% " B.T.U., Dry 13,500 Min. A.S.T. 2,080°F "	$7.69 Bin Delivered	Acme Fuel Charles Buddeke Coal Co.

(Continued)

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	MICHIGAN				
29.	Battle Creek, Michigan, GSA, PBS Federal Center Delivering carrier – NYC (MCRR) Gondola cars required. Bin capacity – 400 Tons, Bldg. #5 Ground storage – 4,000 Tons, W. Jackson Street Yard. Activity has own siding.	200 Tons – Sept 600 " – Oct. 850 " – Nov. 950 " – Dec. 950 " – Jan. 950 " – Feb. 800 " – Mar. 400 " – Apr. 300 " – May 200 " – June 6200 " Total	1-1/4" x 1/4" Washed – Oil Treated Moisture as Received – 4.4% Max. Volatile, Dry – 36.7% " Ash, Dry – 6.4% " Sulphur, Dry – 1.3% " B.T.U., Dry. 14,320 Min. A.S.T. 2,600°F "	$10.92 Cars Destination	Scotia Coal Co.
30.	Watersmeet, Michigan, U.S. Forest Service Bin capacity – 60 tons. Bin delivery required by truck Activity does not have its own siding.	50 Tons – Nov. 50 " – Feb. 50 " – April 150 " Total	1" x 3/8" Washed and treated stoker. Moisture as Received – 8.0% Max. Volatile, Dry – 42.0% " Ash, Dry – 8.5% " Sulphur, Dry (Unknown) B.T.U., Dry 13,300 Min. A.S.T. 2,150°F "	$13.65 Bin Delivered	C. Reiss Coal Co.

(Continued)

1734

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
	OHIO				
31.	Cleveland, Ohio, N.A. & S.A. Lewis Research Center. Coal is to be deep mined only, washed or dry cleaned nut, free burning for use in Firite spreader type Stoker.	500 Tons – Oct. 1000 " – Nov. 1000 " – Dec. 1000 " – Jan. 1000 " – Feb. 1000 " – Mar. 1000 " – April 500 " – May 7,000 " Total	1-1/4" x 3/8" Stoker No slack Moisture as Received – 5.3% Max. Volatile, Dry – 43.2% " Ash, Dry – 10.0% " Sulphur, Dry – 3.0% " B.T.U., Dry 13,000 Min. A.S.T. 2,100°F "	$8.10 Bin Delivered	Midvale Coal Co.
	Coal supplier shall remove the flyash from the storage hopper at the heating plant. Loading of flyash will be done by the Government. It is the intent of this Laboratory that the 200 ton hopper in the steam generating plant be kept filled to its capacity at all times, and deliveries will be accepted at all times. However, not more than 20% of the deliveries should be made between the hours of 5 P.M. and 8 A.M. the next day. Yard storage – 7000 tons.				
32.	Columbus, Ohio, PBS, U.S. Post Office and Courthouse, 85 Marconi Blvd. (new) Activity does not have its own siding. Bin capacity – 100 tons.	100 Tons – Oct. 200 " – Nov. 200 " – Dec. 200 " – Jan. 200 " – Feb. 100 " – Mar. 100 " – April 100 " – May 1,200 " Total	1-1/4" x 1/4" Stoker Moisture as Received – 2.9% Max. Volatile, Dry – 37.0% " Ash, Dry – 5.3% " Sulphur, Dry – 1.0% " B.T.U., Dry 14,475 Min. A.S.T. 2,960°F "	$9.47 Cars Destination	Scotia Coal Co.

1735

LIST OF CONTRACTORS

ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law, 152, 81st Congress

Contract No.	Name and Address	Telephone No.
[1]GS-05S-4843	Atlas Coal & Blacktop, Inc. 1105 Sarasota Street Newport, Kentucky Terms: Net Name of Mine: Guyan #4 Mine Location & Shipping Point: Stowe, Logan County, West Va.	(606) 431-1672
[2]GS-05S-4939	Bell & Zoller Coal Company 208 South LaSalle Street Chicago, Illinois 60604 Terms: Net Name of Mine: Zeigler #4 (Item #3 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Zeigler Mine, Illinois Name of Mine: Mount Pleasant (Item #25 Mine Location: Terre Haute, Vigo, Indiana Mine Shipping Point: Terre Haute, Indiana	(312) CE6-4222
[2]GS-05S-4845 (Item 16)	Great Lakes Coal & Dock Co. 611 E. Wisconsin Avenue Milwaukee, Wisconsin 53202 Terms: Net Name of Mine: Guyan #5 Mine Location & Shipping Point: Kelly, Logan County, W. Va.	(414) 272-4285
[2]GS-05S-4944 (Item 17)	Great Lakes Coal & Dock Co. 611 E. Wisconsin Avenue Milwaukee, Wisconsin 53202 Terms: Net Name of Mine: Orient #4 Mine Location & Shipping Point: Johnston City, Williamson, Illinois	(414) 272-4285

(Continued)

LIST OF CONTRACTORS

ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law 152, 81st Congress

Contract No.	Name and Address	Telephone No.
*GS-05S-4945	Dunn Coal & Oil Company 5100 So. Federal Street Chicago, Illinois 60609 Terms: Net Name of Mine: Orient No. 4 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Orient No. 4, Illinois	(312) OA4-1551
*GS-05S-4938	Enos Coal Sales Div. Pickands Mather & Co. (Agent for Enos Coal Corp.) 300 Fidelity Bldg. 111 Monument Circle Indianapolis, Indiana 46204 Terms: Net Name of Mine: Blackfoot Five Mine Location & Shipping Point: Winslow, Pike County, Indiana	(317) 636-6591
*GS-05S-4946	Freeman Coal Mining Corporation 300 W. Washington Street Chicago, Illinois 60606 Terms: Net Name of Mine: Orient No. 4 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Orient No. 4, Illinois	(312) AN3-2800
*GS-05S-4937	Frontenac Coal Corporation 105 South Meridian Street Indianapolis, Indiana 46225 Terms: Net Name of Mine: Harmattan Mine Location: Danville, Vermilion County, Illinois Mine Shipping Point: Hillery, Illinois	(317) 632-2441

(Continued)

LIST OF CONTRACTORS

ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law 152, 81st Congress

Contract No.	Name and Address	Telephone No.
*GS-05S-4940	Scotia Coal Company P.O. Box 10080 Knoxville, Tennessee 37919	(615) 588-8511
	Terms: Net Name of Mine: Royal Scot Mine Location & Shipping Point: Scot, Letcher County, Kentucky	
*GS-05S-4947	Hefter Coal & Oil Company 3018 East 95th Street Chicago, Illinois 60617	(312) RE4-6767
	Terms: Net Name of Mine: Zeigler #4 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Zeigler Mine, Illinois	
*GS-05S-4846	Inland Creek Coal Sales Company 1501 Euclid Avenue Cleveland, Ohio	(216) 241-3215
	Terms: Net	
	For Items 8-9-11-13	
	Name of Mine: Guyan #1 Mine Location & Shipping Point: Amherstdale, Logan, W. Va.	
	For Item 14	
	Name of Mine: Guyan #4 Mine Location: Stowe, Logan County, West Va. Mine Shipping Point: Stowe, West Va.	
*GS-05S-4844	Schneider Fuel & Supply Co. 3438 West Forest Home Avenue Milwaukee, Wisconsin 53246	(414) 671-5100
	Terms: Net Mine Location & Shipping Point: Bishop, McDowell, West Va.	

(Continued)

LIST OF CONTRACTORS

ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law, 152, 81st Congress

Contract No.	Name and Address	Telephone No.
GS-05S-4942	Midvale Coal Company, Inc. Inland Creek Coal Sales Company, Agents 1501 Euclid Avenue Cleveland, Ohio 44115 Terms: Net Name of Mine: Midvale Mine Location & Shipping Point: Midvale, Tuscarawas County, Ohio	(216) 241-3215
GS-05S-4943	Peabody Coal Company 301 North Memorial Drive St. Louis, Missouri 63102 Terms: Net For Item 10 Name of Mine: Sunnyhill #9 Mine Location & Shipping Point: New Lexington, Perry County, Ohio	(314) Geneva 6-3400
GS-05S-4810	For Item 24 Name of Mine: Chieftain #20 Mine Location: Riley, Vigo County, Indiana Mine Shipping Point: Keller, Indiana	
GS-05S-4941	The C. Reiss Coal Company Sheboygan, Wisconsin 53081 Terms: Net Name of Mine: Hampton No. 3 Mine Location & Shipping Point: Hampton Mines, Boone County, West Va.	(414) 457-4411

(Continued)

LIST OF CONTRACTORS

ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law, 152, 81st Congress

Contract No.	Name and Address	Telephone No.
*GS-05S-4958	Acme Fuel Charles Buddeke Coal Co. 907 Logan Street Louisville, Kentucky 40202 Name of Mine: Fine Mine Location & Shipping Point: Fine, Kentucky	(502) 584-5263
*GS-05S-5061 *	Charles Buddeke Coal Company 907 Logan Street Louisville, Kentucky 40202 Name of Mine: Fine Mine Location & Shipping Point: Fine, Kentucky	(502) 584-5263

* Contractor is not a small business concern.
* Contractor is a small business concern.

1576

GOVERNMENT EXHIBIT No. 1-A Dep.

GENERAL DYNAMICS CORPORATION

ASSETS

LINE	CLASSIFICATION	ITEM	AMOUNT
1	CURRENT ASSETS		
2	CASH		
3	U.S. AND CANADIAN GOVERNMENT SECURITIES		
4	ACCOUNTS AND NOTES RECEIVABLE—		
5	U.S. AND CANADIAN GOVERNMENTS		—
6			
7	OTHER TRADE RECEIVABLES		
8	LESS—RESERVE FOR DOUBTFUL ACCTS.		
9	OTHER TRADE RECEIVABLES—NET		
10			
11	INTERCOMPANY RECEIVABLES—CURRENT		
12			
13	UNREIMBURSED EXPENDITURES AND RELATED		
14	PROFIT PRINCIPALLY ON AIRCRAFT AND SHIP		
15	CONTRACTS IN PROCESS		—
16			
17	INVENTORIES—		
18	FINISHED GOODS		
19	WORK IN PROCESS		—
20	MATERIALS, PARTS AND SUPPLIES		—
21			
22	LESS—ADVANCE AND PROGRESS PAYMENTS		—
23	INVENTORIES—NET		
24			
25	ADVANCES TO VENDORS AND SUBCONTRACTORS		—
26	PREPAID EXPENSES		
27			
28	TOTAL		
29			
30	INVESTMENTS AND OTHER ASSETS		
31	INVESTMENTS AND ADVANCES—		
32	CONSOLIDATED SUBSIDIARIES		—
33	UNCONSOLIDATED SUBSIDIARIES		—
34	OTHER		
35	REMEASUREMENT RECEIVABLES AND OTHER ASSETS		
36	NOTES AND OTHER RECEIVABLES		
37	USED AIRCRAFT LESS AMORTIZATION		—
38	OTHER ASSETS		
39			
40			
41			
42	TOTAL		
43			
44			
45			
46	FIXED ASSETS		
47	LAND AND IMPROVEMENTS		
48	BUILDINGS AND IMPROVEMENTS		—
49	MACHINERY AND EQUIPMENT		
50	CONSTRUCTION IN PROCESS		
51			
52	LESS—RES. FOR DEPR. AND AMORTIZATION		
53	FIXED ASSETS—NET		
54			
55	TOTAL		

Pg 1741 of 2000

12/61 pt. 8226

GOVERNMENT EXHIBIT No. Imp. 1-B

"F" GENERAL DYNAMICS CORPORATION

LIABILITIES, CAPITAL & SURPLUS

DECEMBER 31, 1961

LINE	CLASSIFICATION	CODE	CURRENT
1	CURRENT LIABILITIES:		
2	NOTES PAYABLE		—
3	CURRENT PORTION OF LONG-TERM DEBT		—
4	ACCOUNTS PAYABLE		[illegible]
5	ACCRUED SALARIES AND WAGES		[illegible]
6	U.S. AND CANADIAN INCOME TAXES		[illegible]
7	OTHER ACCRUED TAXES		[illegible]
8	CONTRACT DEPOSITS AND ADVANCES IN EXCESS OF RELATED COSTS		—
9	DIVIDENDS PAYABLE		—
10	INTERCOMPANY PAYABLES — CURRENT		[illegible]
11	[illegible]		[illegible]
12	[illegible]		[illegible]
13	TOTAL		[illegible]
14			
15	LONG-TERM DEBT (LESS CURRENT INSTALLMENTS)		
16	NOTES PAYABLE		—
17	MORTGAGES PAYABLE		—
18			
19	INTERCOMPANY PAYABLES		—
20	TOTAL		—
21			
22	MINORITY INTERESTS		—
23	CAPITAL STOCK		—
24	SURPLUS		—
25			
26	TOTAL		—
27			
28	INTERDIVISION ACCOUNT		—
29	INTERDIVISION CASH ACCOUNT		—
30			
31			
32	CAPITAL STOCK AND SURPLUS:		
33	CAPITAL STOCK —		
34	PREFERRED		—
35	COMMON		[illegible]
36			
37	CAPITAL SURPLUS		—
38			
39	EARNED SURPLUS —		
40	BALANCE AT BEGINNING OF YEAR		[illegible]
41	PROFIT (LOSS) FOR THE PERIOD		[illegible]
42			
43			
44	LESS-DIVIDENDS		—
45			
46			
47	BALANCE AT END OF PERIOD		[illegible]
48			
49	TOTAL		[illegible]
50			
51	TOTAL		[illegible]

GOVERNMENT EXHIBIT
Aug. Dep.
1-C

GENERAL DYNAMICS CORPORATION

PROFIT AND LOSS

Military Corp. Consolidated
12-31-59

LINE	CLASSIFICATION	CODE	AMOUNT
1	SALES, LESS RETURNS		32 915 740 35
2	DISCOUNTS		-
3	ALLOWANCES		72 085 01
4	NET SALES		32 843 679 34
5			
6	COST OF SALES:		
7	MATERIAL, LABOR AND OVERHEAD		28 230 029 73
8	UNDER (OVER) ABSORBED OVERHEAD		-
9	SELLING AND ADVERTISING EXPENSE		553 156 28
10	GENERAL AND ADMINISTRATIVE EXPENSE		556 122 97
11	RESEARCH AND DEVELOPMENT EXPENSE		-
12	CORP. OFFICE & GEN. ATOMIC DIV. EXPENSE		-
13	TOTAL		29 092 308 95
14			
15	OPERATING PROFIT (LOSS)		3 751 370 38
16			
17	OTHER INCOME (DEDUCTIONS):		
18	DIVIDENDS -		
19	CONSOLIDATED SUBSIDIARIES		-
20	UNCONSOLIDATED SUBSIDIARIES		-
21	OTHER		-
22	INCENTIVE COMPENSATION CREDIT*		-
23	CYLINDER DEMURRAGE		-
24	INTEREST INCOME		55 134 32
25	GAIN ON SALE -		
26	SECURITIES		-
27	FIXED ASSETS		3 837 93
28	ROYALTIES		-
29			
30			
31	INTEREST EXPENSE		137 239 00
32	INCENTIVE COMPENSATION PROVISION		-
33	MINORITY INTERESTS		-
34	OTHER-NET		14 727 83
35	RENEGOTIATION PROFITS REFUND PROVISION		(625 536 00)
36	OTHER INCOME (DEDUCTIONS) - NET		(230 075 53)
37			
38	PROFIT (LOSS) BEFORE TAXES		3 671 298 85
39			
40	PROVISION FOR INCOME TAXES		900 000 00
41			
42	NET PROFIT (LOSS)		2 771 298 85
43	BREAKDOWN OF NET SALES:		
44	RESTRICTED		-
45	UNRESTRICTED		32 843 679 34
46	TOTAL (PER LINE 4)		32 843 679 34
47	INTERDIV. AND INTERCO. TRANSACTIONS:		
48	INTERDIVISION SALES		-
49	INTERCOMPANY -		
50	SALES		2 838 612 78
51	INTEREST INCOME		-
52	INTEREST EXPENSE		-
53	DEPRECIATION, AMORTIZATION AND DEPLETION:		
54	PROPERTY, PLANT AND EQUIP.		3 769 665 02
55	USED AIRCRAFT		-

All expenses paid *For Expenses Other Than Duty

GIBBS

GOVERNMENT EXHIBIT
Nos. Dep.
2-A

GENERAL DYNAMICS CORPORATION

REVISED — MARCH 30, 1961

ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS:		
2	CASH		$ 5 378 023 83
3	U.S. AND CANADIAN GOVERNMENT SECURITIES		3 000 497 05
4	ACCOUNTS AND NOTES RECEIVABLE—		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	OTHER TRADE RECEIVABLES		2 701 856 80
8	LESS—RESERVE FOR DOUBTFUL ACCTS.		27 748 24
9	OTHER TRADE RECEIVABLES—NET		2 674 108 56
10	SHORT TERM SECURITIES		923 833 33
11	INTERCOMPANY RECEIVABLES—CURRENT		3 827 141 11
12			
13	UNREIMBURSED EXPENDITURES AND ESTIMATED		
14	PROFIT PRINCIPALLY ON AIRCRAFT AND SHIP		
15	CONTRACTS IN PROCESS		-
16			
17	INVENTORIES—		
18	FINISHED GOODS		61 253 54
19	WORK IN PROCESS		-
20	MATERIALS, PARTS AND SUPPLIES		-
21			
22	LESS—ADVANCE AND PROGRESS PAYMENTS		-
23	INVENTORIES—NET		61 253 54
24			
25	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
26	PREPAID EXPENSES		7 867 66
27			
28	TOTAL		33 836 785 36
29			
30	INVESTMENTS AND OTHER ASSETS:		
31	INVESTMENTS AND ADVANCES—		
32	CONSOLIDATED SUBSIDIARIES		-
33	UNCONSOLIDATED SUBSIDIARIES		-
34	OTHER		560 937 50
35	NONCURRENT RECEIVABLES AND OTHER ASSETS—		3 550 00
36	NOTES AND OTHER RECEIVABLES		-
37	USED AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		35 002 33
39			
40			
41			
42	TOTAL		379 489 83
43			
44			
45			
46	FIXED ASSETS:		
47	LAND AND IMPROVEMENTS		3 55 611 50
48	BUILDINGS AND IMPROVEMENTS		-
49	MACHINERY AND EQUIPMENT	22	057 765 83
50	CONSTRUCTION IN PROCESS	3	068 660 03
51			
52	LESS—RES. FOR DEPR. AND AMORTIZATION	12	470 808 98
53	FIXED ASSETS—NET	13	007 228 38
54			
55	TOTAL	26	823 143 57

(As restated 3/30)

GOVERNMENT EXHIBIT
Nug. Dep. 2-B

GENERAL DYNAMICS CORPORATION

REVISED - MARCH 30, 1961

LIABILITIES, CAPITAL & SURPLUS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT LIABILITIES:		
2	NOTES PAYABLE		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	ACCOUNTS PAYABLE		$ 882 609 84
5	ACCRUED SALARIES AND WAGES		612 385 67
6	U.S. AND CANADIAN INCOME TAXES		971 470 [illegible]
7	OTHER ACCRUED TAXES		610 375 63
8	CONTRACT DEPOSITS AND ADVANCES BY		
9	EXCESS OF RELATED COSTS		-
10	DIVIDENDS PAYABLE		-
11	INTERCOMPANY PAYABLES - CURRENT		312 908 29
12	[illegible]		305 020 [illegible]
13	[illegible]		259 240 39
14	TOTAL		$ [illegible] 599 [illegible]
15			
16	LONG-TERM DEBT LESS CURRENT INSTALLMENTS:		
17			
18	NOTES PAYABLE		-
19			
20	MORTGAGES PAYABLE		-
21			
22	INTERCOMPANY PAYABLES		-
23			
24	TOTAL		-
25			
26	MINORITY INTERESTS		
27	CAPITAL STOCK		-
28	SURPLUS		-
29			
30	TOTAL		-
31			
32	INTERDIVISION ACCOUNT		-
33	INTERDIVISION CASH ACCOUNT		-
34			
35			
36	CAPITAL STOCK AND SURPLUS:		
37	CAPITAL STOCK -		
38	PREFERRED		-
39	COMMON		63 905 00
40			
41	CAPITAL SURPLUS		-
42			
43	EARNED SURPLUS -		
44	BALANCE AT BEGINNING OF YEAR		16 [illegible] 153 57
45	PROFIT (LOSS) FOR THE PERIOD		8 [illegible] 474 73
46			
47			
48	LESS-DIVIDENDS		-
49			
50			
51	BALANCE AT END OF PERIOD		29 [illegible] 729 30
52			
53	TOTAL		29 [illegible] 283 30
54			
55	TOTAL		28 [illegible] 333 37

FILED UNDER SEC

1591

GOVERNMENT EXHIBIT Mag 2-Dep.

GENERAL DYNAMICS CORPORATION

REVISED - MARCH 30, 1961

PROFIT AND LOSS

1/1/60 - 12/31/60

LINE	CLASSIFICATION	CODE	AMOUNT
1	SALES, LESS RETURNS		32 065 745 70
2	DISCOUNTS		-
3	ALLOWANCES		55 972 99
4	NET SALES		32 009 772 71
5			
6	COST OF SALES:		
7	MATERIAL, LABOR AND OVERHEAD		27 120 636 05
8	UNDER (OVER) ABSORBED OVERHEAD		-
9	SELLING AND ADVERTISING EXPENSE		533 954 33
10	GENERAL AND ADMINISTRATIVE EXPENSE		681 717 40
11	RESEARCH AND DEVELOPMENT EXPENSE		-
12	CORP. OFFICE & GEN. ATOMIC DIV. EXPENSE		-
13	TOTAL		28 336 307 77
14			
15	OPERATING PROFIT (LOSS)		3 673 465 32
16			
17	OTHER INCOME (DEDUCTIONS):		
18	DIVIDENDS -		
19	CONSOLIDATED SUBSIDIARIES		-
20	UNCONSOLIDATED SUBSIDIARIES		-
21	OTHER		250 00
22	INCENTIVE COMPENSATION CREDIT		-
23	CYLINDER DEMURRAGE		-
24	INTEREST INCOME		76 918 45
25	GAIN ON SALE -		
26	SECURITIES		5 278 66
27	FIXED ASSETS		3 861 66
28	ROYALTIES		-
29			
30			
31	INTEREST EXPENSE		(4 709 97)
32	INCENTIVE COMPENSATION PROVISION		(227 102 00)
33	MINORITY INTERESTS		-
34	OTHER-NET		52 584 25
35			
36	OTHER INCOME (DEDUCTIONS) - NET		(92 909 99)
37			
38	PROFIT (LOSS) BEFORE TAXES		3 580 474 93
39			
40	PROVISION FOR INCOME TAXES		960 000 00
41			
42	NET PROFIT (LOSS)		2 620 474 93
43	BREAKDOWN OF NET SALES:		
44	RESTRICTED		-
45	UNRESTRICTED		32 009 772 71
46	TOTAL (PER LINE 4)		32 009 772 71
47	INTERDIV. AND INTERCO. TRANSACTIONS:		
48	INTERDIVISION SALES		-
49	INTERCOMPANY -		
50	SALES		1 121 560 78
51	INTEREST INCOME		-
52	INTEREST EXPENSE		-
53	DEPRECIATION, AMORTIZATION AND DEPLETION:		
54	PROPERTY, PLANT AND EQUIP.		1 612 133 96
55	USED AIRCRAFT		-

REVISED 3-61 *For Corporate Office Use Only

~~G3284~~ 1582

GOVERNMENT EXHIBIT Mag. Dep. 3-A

GENERAL DYNAMICS CORPORATION

ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS:		
2	CASH		$ 5 017 942
3	GOVERNMENT & OTHER MARKETABLE SECURITIES		3 075 576
4	ACCOUNTS AND NOTES RECEIVABLE—		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	NOTES RECEIVABLE		-
8	OTHER TRADE RECEIVABLES		2 860 132
9	LESS—RESERVE FOR DOUBTFUL ACCTS.		17 796
10	NOTES AND OTHER TRADE REC.—NET		2 842 336
11			
12	INTERCOMPANY RECEIVABLES—CURRENT		168 910
13			
14	UNRECOVERED EXPENDITURES AND ESTIMATED PROFITS ON CONTRACTS IN PROCESS		-
15			
16	INVENTORIES:		
17	FINISHED GOODS		53 508
18	WORK IN PROCESS		-
19	MATERIALS, PARTS AND SUPPLIES		-
20	TOTAL		53 508
21	LESS—ADVANCE AND PROGRESS PAYMENTS		-
22	INVENTORIES—NET		53 508
23			
24	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
25	PREPAID EXPENSES		2 651
26			
27			
28	TOTAL		11 159 222
29	INVESTMENTS AND OTHER ASSETS:		
30	INVESTMENTS AND ADVANCES—		
31	CONSOLIDATED SUBSIDIARIES		-
32	UNCONSOLIDATED SUBSIDIARIES		-
33	OTHER		102 535
34	NONCURRENT RECEIVABLES AND OTHER ASSETS—		
35	NOTES RECEIVABLE		-
36	OTHER RECEIVABLES		3 450
37	USED AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		16 672
39			
40			
41	TOTAL		122 659
42	PROPERTY, PLANT AND EQUIPMENT:		
43	LAND		171 724
44	LAND IMPROVEMENTS		2 530 137
45	TOTAL LAND AND IMPROVEMENTS		2 701 861
46	BUILDINGS AND IMPROVEMENTS		-
47	MACHINERY AND EQUIPMENT		27 146 040
48	CONSTRUCTION IN PROCESS		-
49	TOTAL		30 160 503
50	LESS—INCL. FOR DEPR. AND AMORTIZATION		14 290 598
51			
52	FIXED ASSETS—NET		15 869 905
53			
54	TOTAL		27 151 743

Pro received Date

Nugent b-p Ex 3-A 9/10/68

GOVERNMENT EXHIBIT Aug. 3-B Dep.

GENERAL DYNAMICS CORPORATION

LIABILITIES, CAPITAL & SURPLUS

Consolidated
Balance Sheet
Dec. 31, 1948

LINE	CLASSIFICATION	CODE	ACCOUNT
1	CURRENT LIABILITIES:		
2	NOTES PAYABLE TO BANKS		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	OTHER NOTES PAYABLE		-
5	ACCOUNTS PAYABLE		$ 755 107
6	ACCRUED SALARIES AND WAGES		410 919
7	U.S. AND CANADIAN INCOME TAXES		1 014 013
8	OTHER ACCRUED TAXES		222 996
9	CONTRACT DEPOSITS AND ADVANCES IN EXCESS OF RELATED COSTS		-
10	DIVIDENDS PAYABLE		-
11	INTERCOMPANY PAYABLES - CURRENT		854 589
12			
13			
14	TOTAL		$ 3 256 624
15	LONG-TERM DEBT (LESS CURRENT INSTALLMENTS)		
16			
17	NOTES PAYABLE		-
18			
19	MORTGAGES PAYABLE		-
20			
21	INTERCOMPANY PAYABLES		-
22			
23	TOTAL		-
24	MINORITY INTERESTS		
25	CAPITAL STOCK		-
26			
27	SURPLUS		-
28			
29	TOTAL		-
30	INTERDIVISION ACCOUNTS		
31	CURRENT ACCOUNT		-
32	CAPITAL ACCOUNT		-
33			
34	TOTAL		-
35	CAPITAL STOCK AND SURPLUS		
36	CAPITAL STOCK OF GENERAL DYNAMICS -		
37	PREFERRED		-
38	COMMON		-
39	CAPITAL STOCK OF CONSOLIDATED SUBS. -		
40	PREFERRED		-
41	COMMON		61 765
42			
43	CAPITAL SURPLUS		-
44			
45	EARNED SURPLUS -		
46	BALANCE AT BEGINNING OF YEAR		19 354 939
47			
48	PROFIT (LOSS) FOR THE PERIOD		2 618 585
49			
50	LESS-DIVIDENDS		-
51	BALANCE AT END OF PERIOD		21 973 524
52	TOTAL		24 035 289
53			
54	TOTAL		27 351 761

(Line numbers 2-8 and 46-48 are indented)

Wagner Dep
Ex 3-B
9/10/48

GOVERNMENT EXHIBIT Nug 3-C Dep

GENERAL DYNAMICS CORPORATION

PROFIT AND LOSS

LINE	CLASSIFICATION	CODE	[illegible] Mining Corp. and Consolidated 1/1/61 - 12/31/61
1	SALES, LESS RETURNS		29 958 [illegible]
2	[illegible]		-
3	[illegible]		77 [illegible]
4	NET SALES		29 879 [illegible]
5	COST OF SALES:		
6	MATERIAL, LABOR AND OVERHEAD		25 375 [illegible]
7	[illegible]		-
8	[illegible]		498 [illegible]
9	[illegible]		678 [illegible]
10	[illegible]		-
11	[illegible]		-
12			
13	TOTAL		26 552 [illegible]
14			
15	OPERATING PROFIT (LOSS)		3 327 [illegible]
16	OTHER INCOME (DEDUCTIONS):		
17	DIVIDENDS -		
18	CONSOLIDATED SUBSIDIARIES		-
19	UNCONSOLIDATED SUBSIDIARIES		-
20	OTHER		892
21	INCENTIVE COMPENSATION CREDIT		-
22	CYLINDER DAMAGE		-
23	INTEREST INCOME		72 [illegible]
24	GAIN ON SALE -		
25	SECURITIES		-
26	FIXED ASSETS		3 [illegible]
27	ROYALTIES		-
28			
29			
30	INTEREST EXPENSE		(915)
31	INCENTIVE COMPENSATION PROVISION		(352) (660)
32	MINORITY INTERESTS		-
33			
34	OTHER-NET		(182)
35	OTHER INCOME (DEDUCTIONS) - NET		(8) [illegible]
36	PROFIT (LOSS) BEFORE TAXES		3 [illegible] [illegible]
37			
38	PROVISION FOR INCOME TAXES		- 625 [illegible]
39			
40	NET PROFIT (LOSS)		2 818 [illegible]
41	BREAKDOWN OF NET SALES:		
42	NONTAXED		-
43	CONSTRUCTED		29 819 [illegible]
44	TOTAL (PER LINE 4)		29 879 [illegible]
45	INTERDIV. AND INTERCO. TRANSACTIONS:		
46	INTERDIVISION SALES		-
47	INTERCOMPANY-		
48	SALES		3 [illegible] [illegible]
49	INTEREST INCOME (EXPENSE)		-
50			
51	DEPRECIATION, AMORTIZATION AND DEPLETION:		
52	PROPERTY, PLANT AND EQUIP.		2 826 [illegible]
53	DEPLETION IN EXCESS OF COST BASIS		2 819 [illegible]
54	USED AIRCRAFT		-
55			

For Corporate Office Use Only

Nugent Dep Ex 3-C, Id 9/6/64

Plaintiff's Exhibit 1595

GOVERNMENT EXHIBIT No. 4-A Dep.

GENERAL DYNAMICS CORPORATION

ASSETS

LINE	CLASSIFICATION	CODE	Consolidated Balance Sheet (Excluding Convair) December 31, 1962
			Amount
1	CURRENT ASSETS:		
2	CASH		33 908 384
3	GOVERNMENT & OTHER MARKETABLE SECURITIES		3 843 525
4	ACCOUNTS AND NOTES RECEIVABLE-		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	NOTES RECEIVABLE		6 500
8	OTHER TRADE RECEIVABLES		3 270 438
9	LESS--RESERVE FOR DOUBTFUL ACCTS.		12 796
10	NOTES AND OTHER TRADE REC.--NET		3 265 390
11			
12	INTERCOMPANY RECEIVABLES--CURRENT		346 339
13			
14	UNLIQUIDATED EXPENDITURES AND ESTIMATED PROFITS ON CONTRACTS IN PROCESS		-
15			
16	INVENTORIES-		
17	FINISHED GOODS		54 568
18	WORK IN PROCESS		-
19	MATERIALS, PARTS AND SUPPLIES		-
20	TOTAL		54 568
21	LESS--ADVANCE AND PROGRESS PAYMENTS		-
22	INVENTORIES--NET		54 568
23			
24	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
25	PREPAID EXPENSES		2 339
26			
27			
28	TOTAL		38 [illegible] 284
29	INVESTMENTS AND OTHER ASSETS:		
30	INVESTMENTS AND ADVANCES-		
31	CONSOLIDATED SUBSIDIARIES		-
32	UNCONSOLIDATED SUBSIDIARIES		-
33	OTHER		571 554
34	NONCURRENT RECEIVABLES AND OTHER ASSETS-		
35	NOTES RECEIVABLE		-
36	OTHER RECEIVABLES		3 345
37	USED AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		38 528
39			
40			
41	TOTAL		413 [illegible] 428
42	PROPERTY, PLANT AND EQUIPMENT)		
43	LAND		335 705
44	LAND IMPROVEMENTS		2 507 583
45	TOTAL LAND AND IMPROVEMENTS		2 692 786
46	BUILDINGS AND IMPROVEMENTS		-
47	MACHINERY AND EQUIPMENT		28 748 458
48	CONSTRUCTION IN PROCESS		37 411
49	TOTAL		31 478 655
50	LESS--RES. FOR DEPR. AND AMORTIZATION		16 [illegible] 758
51			
52	FIXED ASSETS--NET		14 [illegible] 896
53			
54	TOTAL		35 [illegible] 824

P-D (REVISED 8-61)

Nugent. Dep Ex 4-A 9/10/63

1751

Pltf Exhibit 1586

GOVERNMENT EXHIBIT Nugent Dep. 4-B

GENERAL DYNAMICS CORPORATION

LIABILITIES, CAPITAL & SURPLUS

Form No. 1 Revised Corporation Balance Sheet — December 31, 1962

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT LIABILITIES		
2	NOTES PAYABLE TO BANKS		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	OTHER NOTES PAYABLE		-
5	ACCOUNTS PAYABLE		715 243
6	ACCRUED SALARIES AND WAGES		630 266
7	U.S. AND CANADIAN INCOME TAXES		905 027
8	OTHER ACCRUED TAXES		467 578
9	CONTRACT DEPOSITS AND ADVANCES IN EXCESS OF RELATED COSTS		-
10	DIVIDENDS PAYABLE		-
11	INTERCOMPANY PAYABLES - CURRENT		4 520 187
12			
13			
14	TOTAL		8 839 029
15	LONG-TERM DEBT (LESS CURRENT INSTALLMENTS)		
16			
17	NOTES PAYABLE		-
18			
19	MORTGAGES PAYABLE		-
20			
21	INTERCOMPANY PAYABLES		-
22			
23	TOTAL		-
24	MINORITY INTERESTS		-
25	CAPITAL STOCK		
26			
27	SURPLUS		-
28			
29	TOTAL		-
30	INTERDIVISION ACCOUNTS		
31	CURRENT ACCOUNT		-
32	CASH ACCOUNT		-
33			
34	TOTAL		-
35	CAPITAL STOCK AND SURPLUS		
36	CAPITAL STOCK OF GENERAL DYNAMICS-		
37	PREFERRED		-
38	COMMON		-
39	CAPITAL STOCK OF CONSOLIDATED SUBS.-		
40	PREFERRED		-
41	COMMON		63 905
42			
43	CAPITAL SURPLUS		-
44			
45	EARNED SURPLUS-		
46	BALANCE AT BEGINNING OF YEAR		20 348 395
47			
48	PROFIT (LOSS) FOR THE PERIOD		2 200 429
49			
50	LESS-DIVIDENDS		-
51	BALANCE AT END OF PERIOD		22 548 824
52	TOTAL		22 612 729
53			
54	TOTAL		30 451 758

Nugent Dep Ex 4-B ff. 9/10/64

P-51 REVISED 5-60

GENERAL DYNAMICS CORPORATION

PROFIT AND LOSS

GOVERNMENT EXHIBIT Plaintiff's Dep. 4-C

Line	Classification	Code	Amount
1	SALES, LESS RETURNS		
2	DISCOUNTS		30 255 651
3	ALLOWANCES		317 674
4	NET SALES		30 334 977
5	COST OF SALES:		
6	MATERIAL, LABOR AND OVERHEAD		26 362 278
7	UNDER (OVER) ABSORBED OVERHEAD		-
8	SELLING AND ADVERTISING EXPENSE		337 278
9	GENERAL AND ADMINISTRATIVE EXPENSE		835 406
10	RESEARCH AND DEVELOPMENT EXPENSE		-
11	CONG. OPTNS. & GEN. ATOMIC DEV. EXPENSE		-
12			
13	TOTAL		27 535 962
14			
15	OPERATING PROFIT (LOSS)		2 798 015
16	OTHER INCOME (DEDUCTIONS)		
17	DIVIDENDS -		
18	CONSOLIDATED SUBSIDIARIES		-
19	UNCONSOLIDATED SUBSIDIARIES		-
20	OTHER		850
21	INCENTIVE COMPENSATION CREDIT*		-
22	CYLINDER DEMURRAGE		-
23	INTEREST INCOME	388	694
24	GAIN ON SALE -		
25	SECURITIES		-
26	FIXED ASSETS	5	389
27	ROYALTIES		-
28			
29			
30	INTEREST EXPENSE		-
31	INCENTIVE COMPENSATION PROVISION		-
32	MINORITY INTERESTS		-
33			
34	OTHER-NET	(3	300)
35	OTHER INCOME (DEDUCTIONS) - NET	333	905
36	PROFIT (LOSS) BEFORE TAXES	3 340	409
37			
38	PROVISION FOR INCOME TAXES	1	340 000
39			
40	NET PROFIT (LOSS)	2 000	409
41	BREAKDOWN OF NET SALES		
42	RESTRICTED		-
43	UNRESTRICTED	30 334	977
44	TOTAL (PER LINE 4)	30 334	977
45	INTERDIV. AND INTERCO. TRANSACTIONS		
46	INTERDIVISION SALES		-
47	INTERCOMPANY-		
48	SALES	3 325	787
49	INTEREST INCOME (EXPENSE)		-
50			
51	DEPRECIATION, AMORTIZATION AND DEPLETION		
52	PROPERTY, PLANT AND EQUIP.	1	335 615
53	DEPLETION IN EXCESS OF COST BASE	2	799 850
54	USED AIRCRAFT		-
55			

Footnotes omitted *For Corporate Office Use Only

P 1961
1587

Augment. Ex. 4-C, 32
9/10/62

1522

GOVERNMENT EXHIBIT Mag. Dep. 5-A

GENERAL DYNAMICS CORPORATION

Final

ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS:		
2	CASH		$ 203 231
3	GOVERNMENT & OTHER MARKETABLE SECURITIES		611 475
4	ACCOUNTS AND NOTES RECEIVABLE-		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	NOTES RECEIVABLE:		-
8	OTHER TRADE RECEIVABLES		554 406
9	LESS--RESERVE FOR DOUBTFUL ACCTS.		17 748
10	NOTES AND OTHER TRADE REC.--NET		546 708
11			
12	INTERCOMPANY RECEIVABLES--CURRENT		370 826
13			
14	UNLIQUIDATED EXPENDITURES AND ESTIMATED PROFITS ON CONTRACTS IN PROCESS		-
15			
16	INVENTORIES-		
17	FINISHED GOODS		93 853
18	WORK IN PROCESS		-
19	MATERIALS, PARTS AND SUPPLIES		-
20	TOTAL		93 853
21	LESS--ADVANCE AND PROGRESS PAYMENTS		-
22	INVENTORIES--NET		93 853
23			-
24	ADVANCES TO VENDORS AND SUBCONTRACTORS		19 774
25	PREPAID EXPENSES		
26			
27			
28	TOTAL		27 049 832
29	INVESTMENTS AND OTHER ASSETS:		
30	INVESTMENTS AND ADVANCES-		
31	CONSOLIDATED SUBSIDIARIES		-
32	UNCONSOLIDATED SUBSIDIARIES		-
33	OTHER		321 679
34	NONCURRENT RECEIVABLES AND OTHER ASSETS-		
35	NOTES RECEIVABLE:		-
36	OTHER RECEIVABLES		-
37	HELD AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		29 040
39			
40			
41	TOTAL		372 [illegible]
42	PROPERTY, PLANT AND EQUIPMENT:		385 423
43	LAND		8 227 [illegible]
44	LAND IMPROVEMENTS		8 [illegible]
45	TOTAL LAND AND IMPROVEMENTS		8 634 [illegible]
46	BUILDINGS AND IMPROVEMENTS		87 972 [illegible]
47	MACHINERY AND EQUIPMENT		-
48	CONSTRUCTION IN PROCESS		33 771 [illegible]
49	TOTAL		30 659 [illegible]
50	LESS--RES. FOR DEPR. AND AMORTIZATION		-
51			89 659 [illegible]
52	FIXED ASSETS--NET		-
53			
54	TOTAL		33 [illegible] 832

P-2 (REVISED 6-60)

GOVERNMENT EXHIBIT Nug. Dep. 5-B

GENERAL DYNAMICS CORPORATION

LIABILITIES, CAPITAL & SURPLUS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT LIABILITIES:		
2	NOTES PAYABLE: TO BANKS		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	OTHER NOTES PAYABLE		-
5	ACCOUNTS PAYABLE:		2 [illegible]
6	ACCRUED SALARIES AND WAGES		[illegible]
7	U.S. AND CANADIAN INCOME TAXES		1 [illegible]
8	OTHER ACCRUED TAXES		[illegible]
9	CONTRACT DEPOSITS AND ADVANCES IN EXCESS OF RELATED COSTS		-
10	DIVIDENDS PAYABLE:		-
11	INTERCOMPANY PAYABLES - CURRENT		153 [illegible]
12			
13			
14	TOTAL		4 [illegible]
15	LONG-TERM DEBT (LESS CURRENT INSTALLMENTS)		
16			
17	NOTES PAYABLE:		-
18			
19	MORTGAGES PAYABLE:		-
20			
21	INTERCOMPANY PAYABLES		-
22			
23	TOTAL		-
24	MINORITY INTERESTS		
25	CAPITAL STOCK		-
26			
27	SURPLUS		-
28			
29	TOTAL		-
30	INTERDIVISION ACCOUNTS		
31	CURRENT ACCOUNT		-
32	CASH ACCOUNT		-
33			
34	TOTAL		-
35	CAPITAL STOCK AND SURPLUS:		
36	CAPITAL STOCK OF GENERAL DYNAMICS:		
37	PREFERRED		-
38	COMMON		-
39	CAPITAL STOCK OF CONSOLIDATED SUBS.:		
40	PREFERRED		-
41	COMMON		63 [illegible]
42			
43	CAPITAL SURPLUS		-
44			
45	EARNED SURPLUS:		
46	BALANCE AT BEGINNING OF YEAR		29 [illegible]
47			
48	PROFIT (LOSS) FOR THE PERIOD		- 2 [illegible]
49			
50	LESS-DIVIDENDS		-
51	BALANCE AT END OF PERIOD		[illegible]
52	TOTAL		[illegible]
53			
54	TOTAL		[illegible]

GOVERNMENT EXHIBIT Nuc. Dep. 5-C

GENERAL DYNAMICS CORPORATION

PROFIT AND LOSS

LINE	CLASSIFICATION	CODE	AMOUNT
1	SALES, LESS RETURNS		28 332 983
2	DISCOUNTS		-
3	ALLOWANCES		2 [illegible]
4	NET SALES		28 [illegible]
5	COST OF SALES:		
6	MATERIAL, LABOR AND OVERHEAD		23 223 220
7	UNDER (OVER) ABSORBED OVERHEAD		-
8	SELLING AND ADVERTISING EXPENSE		510 934
9	GENERAL AND ADMINISTRATIVE EXPENSE		758 005
10	RESEARCH AND DEVELOPMENT EXPENSE		-
11	CONS. OFFICE & GEN. ATOMIC DEV. EXPENSE		-
12			
13	TOTAL		25 532 057
14			
15	OPERATING PROFIT (LOSS)		3 [illegible]
16	OTHER INCOME (DEDUCTIONS):		
17	DIVIDENDS —		
18	CONSOLIDATED SUBSIDIARIES		-
19	UNCONSOLIDATED SUBSIDIARIES		-
20	OTHER		730
21	INCENTIVE COMPENSATION CREDIT		-
22	CYLINDER DISCARDAGE		-
23	INTEREST INCOME		311 374
24	GAIN ON SALE —		
25	SECURITIES		-
26	FIXED ASSETS		13 016
27	ROYALTIES		-
28			
29			
30	INTEREST EXPENSE		(387 000)
31	INCENTIVE COMPENSATION PROVISION		-
32	MINORITY INTERESTS		-
33			
34	OTHER (NET)		(3 272)
35	OTHER INCOME (DEDUCTIONS) - NET		[illegible]
36	PROFIT (LOSS) BEFORE TAXES	2	233 [illegible]
37			
38	PROVISION FOR INCOME TAXES		205 000
39			
40	NET PROFIT (LOSS)	2	[illegible]
41	BREAKDOWN OF NET SALES:		
42	RESTRICTED		-
43	UNRESTRICTED	28	332 983
44	TOTAL (PER LINE 4)	28	[illegible]
45	INTERDIV. AND INTERCO. TRANSACTIONS:		
46	INTRADIVISION SALES		-
47	INTERCOMPANY:		
48	SALES	3	372 983
49	INTEREST INCOME (EXPENSE)		38 850
50			
51	DEPRECIATION, AMORTIZATION AND DEPLETION:	2	252 983
52	PROPERTY, PLANT AND EQUIP.	3	839 927
53	DEPLETION IN EXCESS OF COST BASIS		-
54	USED AIRCRAFT		
55			

*For Corporate Office Use Only

GOVERNMENT EXHIBIT Navy Dep. 6-A

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

Period 1/30/59

LINE	CLASSIFICATION	AMOUNT		
1	CASH			
2	MARKETABLE SECURITIES			
3	RECEIVABLES – GOVERNMENT			
4	– OTHER, LESS RESERVES			
5	INVENTORIES:			
6				
7	LESS: ADVANCES AND PROGRESS PAYMENTS			
8	NET INVENTORIES			
9	PREPAID EXPENSES			
10	OTHER CURRENT ASSETS			
11				
12				
13	TOTAL CURRENT ASSETS			
14				
15	INVESTMENTS AND ADVANCES			
16	NON-CURRENT RECEIVABLES AND OTHER ASSETS			
17				
18	PROPERTY, PLANT AND EQUIPMENT – GROSS			
19	– NET			
20				
21	TOTAL ASSETS			
22				
23	NOTES PAYABLE TO BANKS			
24	CURRENT INSTALLMENTS ON LONG-TERM DEBT			
25	ACCOUNTS PAYABLE AND ACCRUED EXPENSES			
26	ACCRUED INCOME AND TAXES			
27	U.S. AND CANADIAN INCOME TAXES			
28	DIVIDENDS DECLARED			
29	ADVANCES PAYABLE			
30	OTHER CURRENT LIABILITIES			
31				
32				
33	TOTAL CURRENT LIABILITIES			
34				
35	LONG-TERM DEBT (LESS CURRENT PORTION)			
36	MINORITY INTERESTS			
37				
38	DEFERRED INCOME			
39				
40	PREFERRED STOCK – SUBSIDIARY			
41	– DIVISION			
42	SHARE OWNERS' EQUITY			
43	PREFERENCE:			
44	COMMON			
45	SURPLUS AND RETAINED			
46	CAPITAL SURPLUS			
47				
48	EARNED SURPLUS, BEGINNING OF YEAR			
49	NET INCOME, YEAR			
50	DIVIDENDS – PREFERENCE:			
51	COMMON			
52				
53	EARNED SURPLUS, END OF PERIOD			
54	TOTAL SHARE OWNERS' EQUITY			
55	TOTAL LIABILITIES AND EQUITY			

REPORT FROM: Pomona Plant, Pomona, California

DATE: December 31, 1958

GOVERNMENT EXHIBIT Aug. Dep. 6-B

GENERAL DYNAMICS CORPORATION

INCOME STATEMENT

Revised 2/20/68

REPORT FROM [illegible] Corp.

DATE December 31, 1967

LINE	MONTH	AMOUNT		
1				
2	NET SALES	3	031	040
3				
4	OPERATING PROFIT (LOSS)		(142	030)
5				
6	OTHER INCOME (DEDUCTIONS)		529	001
7				
8	PRETAX PROFIT (LOSS)		245	036
9				
10	PROVISION FOR INCOME TAXES		(142	371)
11				
12	NET INCOME (LOSS)		3.0	207
13				
14	SALES – INTERCOMPANY		3 1	040
15	– INTERDIVISION		-	
16				
17	STATISTICAL DATA			
18	NET SALES (LINE 2)	3	031	040
19	LESS: SUPPORT DIVISION SALES		-	
20	DIVISION SALES BASE	3	031	040
21				
22				
23				
24	YEAR TO DATE			
25				
26	NET SALES	31	017	203
27				
28	OPERATING PROFIT (LOSS)		739	277
29				
30	OTHER INCOME (DEDUCTIONS)		482	819
31				
32	PRETAX PROFIT (LOSS)	1	222	096
33				
34	PROVISION FOR INCOME TAXES		(216	371)
35				
36	NET INCOME (LOSS)	1	437	420
37				
38				
39	SALES – NONCOMPANY:		-	
40	– NONDIVISION	31	017	203
41	TOTAL (LINE 39)	31	017	203
42	SALES – INTERCOMPANY		-	
43	– INTERDIVISION		-	
44	INTEREST EXPENSE (INCOME) – NET		(97	0077
45	DEPLICIATION, AMORTIZATION, ETC.	2	393	532
46	DEPLETION IN EXCESS OF COST	1	005	377
47				
48	STATISTICAL DATA			
49	NET SALES (LINE 39)	31	017	203
50	LESS: SUPPORT DIVISION SALES		-	
51	DIVISION SALES BASE	31	017	203
52				
53				
54				
55				

REPORT FROM [illegible] Corp.

DATE December 31, 1967

August Dep Ex 6-B IR 9/10/68

1965

GOVERNMENT EXHIBIT Nug. Dep. 7-A

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

REPORT FROM: Freeman Coal Mining Corp.
DATE: December 31, 1965

LINE	CLASSIFICATION		AMOUNT		
1	CASH		3	169	940
2	MARKETABLE SECURITIES		1	201	636
3	RECEIVABLES – GOVERNMENT				
4	– TRADE (LESS RESERVES		3	355	986
5	UNRECOVERED EXPENDITURES				
6	INVENTORIES			110	813
7	LESS: ADVANCE AND PROGRESS PAYMENTS				
8	NET INVENTORIES			110	813
9	PREPAID EXPENSES			26	852
10	INTERCOMPANY RECEIVABLES		2	789	798
11					
12					
13	TOTAL CURRENT ASSETS		11	146	605
14					
15	INVESTMENTS AND ADVANCES			306	872
16	NON-CURRENT RECEIVABLES AND OTHER ASSETS			21	652
17					
18	PROPERTY, PLANT AND EQUIPMENT – GROSS		35	931	905
19	– NET		13	012	522
20					
21	TOTAL ASSETS		25	487	555
22	Production Payment – Net of Taxes	A	3	896	000
23	NOTES PAYABLE TO BANKS			–	
24	CURRENT INSTALLMENTS ON LONG-TERM DEBT			–	
25	ACCOUNTS PAYABLE AND ACCRUED EXPENSES		2	521	489
26	ACCRUED SALARIES AND WAGES			709	436
27	U.S. AND CANADIAN INCOME TAXES	X	1	668	622
28	CUSTOMERS' DEPOSITS				
29	DIVIDENDS PAYABLE				
30	INTERCOMPANY PAYABLES			369	781
31					
32					
33	TOTAL CURRENT LIABILITIES	X	8	913	328
34	Deferred Federal Income Tax			880	849
35	LONG-TERM DEBT (LESS CURRENT PORTION)				
36	MINORITY INTERESTS				
37					
38	INTERDIVISION ACCOUNTS				
39					
40	INDEBTEDNESS (NET) – INTERCOMPANY				
41	– INTERDIVISION				
42	SHARE OWNERS' EQUITY				
43	PREFERENCE				
44	COMMON			63	905
45	(TREASURY) AND UNEARNED				
46	CAPITAL SURPLUS				
47					
48	EARNED SURPLUS, BEGINNING OF YEAR		28	115	392
49	NET INCOME (LOSS)		1	114	280
50	DIVIDENDS – PREFERENCE			–	
51	COMMON		14	600	000
52				–	
53	EARNED SURPLUS, END OF PERIOD		14	629	572
54	TOTAL SHARE OWNERS' EQUITY		14	693	477
55	TOTAL LIABILITIES AND EQUITY		25	487	654

REPORT FROM: Freeman Coal Mining Corp.

DATE: December 31, 1965

P-G 10-60

1594

GOVERNMENT EXHIBIT Mag. Dep. 7-B

Final Copy

GENERAL DYNAMICS CORPORATION
INCOME STATEMENT

REPORT FROM: Freeman Coal Mining Corp.
DATE: December 31, 1962

LINE		AMOUNT		
1	MONTH			
2	NET SALES	3	078	370
3				
4	OPERATING PROFIT (LOSS)		(279	726)
5				
6	OTHER INCOME (DEDUCTIONS)		(14	473)
7				
8	PRETAX PROFIT (LOSS)		(294	199)
9				
10	PROVISION FOR INCOME TAXES		(610	128)
11				
12	NET INCOME (LOSS)		315	929
13				
14	SALES - INTERCOMPANY		235	874
15	- INTERDIVISION		-	
16				
17	STATISTICAL DATA			
18	NET SALES (LINE 2)	3	078	370
19	LESS: SUPPORT DIVISION SALES		-	
20	DIVISION SALES BASE	3	078	370
21				
22	Dividend Income			250
23				
24	YEAR TO DATE			
25				
26	NET SALES	31	665	837
27				
28	OPERATING PROFIT (LOSS)		10	630
29				
30	OTHER INCOME (DEDUCTIONS)		166	462
31				
32	PRETAX PROFIT (LOSS)		177	092
33				
34	PROVISION FOR INCOME TAXES		(937	128)
35				
36	NET INCOME (LOSS)	1	114	220
37				
38				
39	SALES - NONCONTRACT		-	
40	- NONNEGOTIABLE	31	665	837
41	TOTAL (LINE 39)	31	665	837
42	SALES - INTERCOMPANY	2	088	860
43	- INTERDIVISION			
44	INTEREST EXPENSE (INCOME) - NET	(	179	821)
45	DEPRECIATION, AMORTIZATION, ETC.	2	844	192
46	DEPLETION IN EXCESS OF COST - Book Income	1	083	954
47	- Tax Returns (Est.)	1	154	486
48	STATISTICAL DATA			
49	NET SALES (LINE 26)	31	665	837
50	LESS: SUPPORT DIVISION SALES		-	
51	DIVISION SALES BASE	31	665	837
52	Investment Credit		118	484
53				
54	Dividend Income			500
55				

REPORT FROM: Freeman Coal Mining Corp.
DATE: December 31, 1965

P-10 12-62

1573 GDYA

GOVERNMENT EXHIBIT Nug. Dep. 8-A

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

Date 12/31/66

LINE	CLASSIFICATION		AMOUNT	
1	CASH		$ 514	776
2	MARKETABLE SECURITIES		-	
3	RECEIVABLES - GOVERNMENT		-	
4	- TRADE (LESS DISCOUNTS)		347	905
5	UNRECOVERED EXPENDITURES		-	
6	INVENTORIES		51	490
7	(LESS) ADVANCES AND PROGRESS PAYMENTS		-	
8	NET INVENTORIES		51	490
9	PREPAID EXPENSES		17	193
10	INTERCOMPANY RECEIVABLES		574	135
11				
12				
13	TOTAL CURRENT ASSETS	13	485	900
14				
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES		-	
16	EQUITY, IN EXCESS OF COST - UNCONSOL SUBSIDIARIES		-	
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS		272	351
18				
19	PROPERTY, PLANT AND EQUIPMENT - GROSS	38	084	498
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	25	115	923
21	PROPERTY, PLANT AND EQUIPMENT - NET	12	968	575
22				
23	TOTAL ASSETS	26	646	826
24	Production Payment - Net of Taxes	8	773	240
25	NOTES PAYABLE TO U.S. BANKS		-	
26	NOTES PAYABLE TO CANADIAN BANKS		-	
27	CURRENT INSTALLMENTS ON LONG-TERM DEBT		-	
28	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	2	565	231
29	ACCRUED SALARIES AND WAGES		905	344
30	U.S. AND CANADIAN INCOME TAXES	1	114	357
31	CUSTOMERS' DEPOSITS		-	
32	DIVIDENDS PAYABLE		-	
33	INTERCOMPANY PAYABLES		653	154
34				
35				
36	TOTAL CURRENT LIABILITIES	14	912	136
37				
38	LONG-TERM DEBT (LESS CURRENT PORTION)		-	
39	DEFERRED INCOME TAX		815	601
40	MINORITY INTERESTS		-	
41				
42	INTERDIVISION ACCOUNTS		-	
43				
44	UNREALIZED PROFIT - INTERCOMPANY		-	
45	- INTERDIVISION		-	
46				
47	SHARE OWNER'S EQUITY			
48	CAPITAL STOCK		65	205
49	TREASURY STOCK		-	
50	CAPITAL SURPLUS		-	
51				
52	EARNED SURPLUS, BEGINNING OF YEAR	14	629	572
53	NET INCOME (LOSS)	1	125	552
54	DIVIDENDS - CAPITAL STOCK	(6	000	040)
55				
56				
57				
58	EARNED SURPLUS, END OF PERIOD	9	754	784
59	TOTAL SHARE OWNERS' EQUITY	9	818	989
60	TOTAL LIABILITIES AND EQUITY	26	646	826

REPORT FOR ▷ Precious Coal Mining Corp.

611.1 6/66

Nugent Dep Ex 8-A JR 6/14/68

GOVERNMENT EXHIBIT Mtg. Dep. 8-B

GENERAL DYNAMICS CORPORATION

INCOME STATEMENT

REPORT FROM Freeman Coal Mining Corp.
DATE 12/31/66

LINE	ITEM	AMOUNT		
1	**MONTH**			
2	NET SALES	$	581	115
3	COST OF SALES	$	497	749
4				
5	OPERATING PROFIT (LOSS)		163	366
6	OTHER INCOME (EXPENSE)			
7	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES			
8	INTEREST INCOME			495
9	INTEREST EXPENSE		-	
10	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		56	179
11	MISCELLANEOUS NET		7	062
12				
13	PRETAX PROFIT (LOSS)		207	100
14	PROVISION FOR INCOME TAXES		(560	189)
15	NET INCOME (LOSS)		767	289
16				
17	SALES - INTERCOMPANY		424	610
18	- INTERDIVISION		-	
19				
20	INVESTMENT CREDIT		10	793
21				
22				
23				
24	**YEAR TO DATE**			
25	NET SALES	34	343	920
26	COST OF SALES	34	600	711
27				
28	OPERATING PROFIT (LOSS)		(56	793)
29	OTHER INCOME (EXPENSE)			
30	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES		-	
31	INTEREST INCOME		23	568
32	INTEREST EXPENSE			(576)
33	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		216	160
34	MISCELLANEOUS NET		(141	928)
35				
36	PRETAX PROFIT (LOSS)		40	211
37	PROVISION FOR INCOME TAXES	(1	085	041)
38	NET INCOME (LOSS)	1	125	252
39				
40	SALES - INTERCOMPANY	2	529	990
41	- INTERDIVISION		-	
42				
43	INVESTMENT CREDIT		138	793
44				
45	SALES - NEGOTIABLE		-	
46	- NONNEGOTIABLE	34	343	920
47	TOTAL (LINE 25)	34	343	920
48				
49	STATISTICAL DATA			
50	NET SALES (LINE 25)	34	343	920
51	LESS: SUPPORT DIVISIONS SALES		-	
52	DIVISION SALES PASS	34	343	920
53				
54	DEPRECIATION, AMORTIZATION, ETC.	2	285	877
55	DEPLETION IN EXCESS OF COST		765	207
56	DIVIDENDS RECEIVED - FROM SUBSIDIARIES		-	
57	- OTHERS			500
58				
59				
60				

REPORT FROM Freeman Coal Mining Corp.
DATE 12/31/66

1767

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

Peabody Coal Mining Corp.

DATE 12/31/67

LINE	CLASSIFICATION		AMOUNT	
1	CASH		83	363
2	MARKETABLE SECURITIES		-	
3	RECEIVABLES - GOVERNMENT		-	
4	- TRADE (LESS RESERVES)	3	903	455
5	UNRECOVERABLE EXPENDITURES		-	
6	INVENTORIES		94	584
7	LESS: ADVANCE AND PROGRESS PAYMENTS		-	
8	NET INVENTORIES		94	584
9	PREPAID EXPENSES		14	246
10	INTERCOMPANY RECEIVABLES	6	286	877
11				
12				
13	TOTAL CURRENT ASSETS	8	384	335
14				
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES		-	
16	EQUITY, IN EXCESS OF COST - UNCONSOL. SUBSIDIARIES		-	
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS		367	576
18				
19	PROPERTY, PLANT AND EQUIPMENT - GROSS	40	839	875
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	27	198	103
21	PROPERTY, PLANT AND EQUIPMENT - NET	13	641	772
22				
23	TOTAL ASSETS	22	393	673
24	Production Payment - Net of Taxes	8	661	555
25	NOTES PAYABLE TO U.S. BANKS		-	
26	NOTES PAYABLE TO CANADIAN BANKS		-	
27	CURRENT INSTALLMENTS ON LONG-TERM DEBT		-	
28	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	2	762	587
29	ACCRUED SALARIES AND WAGES		887	736
30	U.S. AND CANADIAN INCOME TAXES	(2	165	051)
31	CUSTOMERS' DEPOSITS		-	
32	DIVIDENDS PAYABLE		-	
33	INTERCOMPANY PAYABLES		98	569
34				
35				
36	TOTAL CURRENT LIABILITIES	10	747	395
37				
38	LONG-TERM DEBT (LESS CURRENT PORTION)		-	
39	DEFERRED INCOME TAX		-	
40	MINORITY INTERESTS	1	162	868
41			-	
42				
43	INTERDIVISION ACCOUNTS		-	
44				
45	UNREALIZED PROFIT - INTERCOMPANY		-	
46	- INTERDIVISION		-	
47				
48	SHARE OWNER'S EQUITY			
49	CAPITAL STOCK		63	903
50	TREASURY STOCK		-	
51	CAPITAL SURPLUS		-	
52				
53	EARNED SURPLUS: BEGINNING OF YEAR	9	754	784
54	NET INCOME (LOSS)	1	037	762
55	DIVIDENDS - CAPITAL STOCK			
56				
57				
58	EARNED SURPLUS, END OF PERIOD	10	812	526
59	TOTAL SHARE OWNER'S EQUITY	10	876	431
60	TOTAL LIABILITIES AND EQUITY	22	293	673

REPORT FROM: Peabody Coal Mining Corp.

DELI 1/67

GOVERNMENT EXHIBIT No. Dep. 9-A

8246

1577

Ph

GOVERNMENT EXHIBIT Mag. Dep. 9-B

			3	967 355
			3	246 161
9				(494)
10				-
11	MISCELLANEOUS		(5	881)
12				
13	PRETAX PROFIT		(184	701)
14	PROVISION FOR INCOME		(4	320)
15	NET INCOME (LOSS)		(180	381)
16				
17	SALES - INTERCOMPANY		440	470
18	- INTERDIVISION		-	
19				
20	INVESTMENT CREDIT		(11	129)
21				
22				
23				
24	YEAR TO DATE			
25	NET SALES	36	714	037
26	COST OF SALES	36	534	490
27				
28	OPERATING PROFIT (LOSS)		179	547
29	OTHER INCOME (EXPENSE)			
30	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES		-	
31	INTEREST INCOME		7	847
32	INTEREST EXPENSE			(494)
33	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		-	
34	MISCELLANEOUS NET		(685	728)
35				
36	PRETAX PROFIT (LOSS)		(498	828)
37	PROVISION FOR INCOME TAXES	(1	556	570)
38	NET INCOME (LOSS)	1	057	742
39				
40	SALES- INTERCOMPANY	3	011	330
41	- INTERDIVISION		-	
42				
43	INVESTMENT CREDIT		75	934
44				
45	SALES- NONNEGOTIABLE		-	
46	- NONNEGOTIABLE	36	714	037
47	TOTAL (LINE 25)	36	714	037
48				
49	STATISTICAL DATA			
50	NET SALES (LINE 25)	36	714	037
51	LESS: SUPPORT DIVISIONS SALES		-	
52	DIVISION SALES BASE	36	714	037
53				
54	DEPRECIATION, AMORTIZATION, ETC.	2	261	340
55	REVALUATION IN EXCESS OF COST	1	164	523
56	DIVIDENDS RECEIVED - FROM SUBSIDIARIES		-	
57	- OTHERS			500
58				
59				
60				

REPORT FROM (1) Arizona Coal Mining Corp.

DATE 12/31/67

~~SDAB~~
1599

GOVERNMENT EXHIBIT
Major 11-A

GENERAL DYNAMICS CORPORATION
INCOME STATEMENT

Research Chart Mining Corporation
DATE 12/31/58

LINE		CURRENT		
1	MONTH			
2	NET SALES			
3	COST OF SALES	2	546	979
4		2	534	710
5	OPERATING PROFIT (LOSS)			
6	OTHER INCOME (EXPENSE)		12	269
7	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES			
8	INTEREST INCOME			
9	INTEREST EXPENSE			475
10	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)			
11	MISCELLANEOUS NET			
12			(48	736)
13	PRETAX PROFIT (LOSS)			
14	PROVISION FOR INCOME TAXES		(35	992)
15	NET INCOME (LOSS)		(166	230)
16			110	238
17	SALES - INTERCOMPANY			
18	- INTERDIVISION		260	224
19				
20	INVESTMENT CREDIT		(10	036)
21				
22				
23				
24	YEAR TO DATE			
25	NET SALES			
26	COST OF SALES	33	411	154
27		36	154	030
28	OPERATING PROFIT (LOSS)			
29	OTHER INCOME (EXPENSE)		(762	876)
30	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES			
31	INTEREST INCOME			
32	INTEREST EXPENSE		5	895
33	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)			
34	MISCELLANEOUS NET			
35			(866	866)
36	PRETAX PROFIT (LOSS)			
37	PROVISION FOR INCOME TAXES	(1	603	847)
38	NET INCOME (LOSS)	(2	396	424)
39			792	577
40	SALES - INTERCOMPANY	2	965	430
41	- INTERDIVISION			
42				
43	INVESTMENT CREDIT		374	047
44				
45	SALES - NEGOTIABLE			
46	- NONNEGOTIABLE			
47	TOTAL (LINE 25)	33	411	154
48		33	411	154
49	STATISTICAL DATA			
50	NET SALES (LINE 25)			
51	LESS: SUPPORT DIVISIONS SALES	33	411	154
52	DIVISION SALES BASE			
53		33	411	154
54	DEPRECIATION, AMORTIZATION, ETC.	2	356	777
55	DEPLETION IN EXCESS OF COST			
56	DIVIDENDS RECEIVED - FROM SUBSIDIARIES			
57	- OTHERS			500
58				
59				
60				

REPORT FROM ▷ Research Chart Mining Corporation 12/31/58

/600

GOVERNMENT EXHIBIT 11-B

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

(DOLLARS)

REPORT FROM ◊ Freeman Coal Mining Corporation

DATE 12/31/66

LINE	CLASSIFICATION		AMOUNT	
1	CASH		66	2.2%
2	MARKETABLE SECURITIES			
3	RECEIVABLE - GOVERNMENT			
4	- TRADE (LESS RESERVES)	3	509	9.5%
5	UNREIMBURSED EXPENDITURES			
6	INVENTORIES		140	6.1%
7	LESS: ADVANCE AND PROGRESS PAYMENTS			
8	NET INVENTORIES		140	6.1%
9	PREPAID EXPENSES		18	7.5%
10	INTERCOMPANY RECEIVABLES	11	135	8.5%
11				
12				
13	TOTAL CURRENT ASSETS	14	871	4.2%
14				
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES			
16	EQUITY, IN EXCESS OF COST - UNCONSOL SUBSIDIARIES			
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS		258	6.1%
18	EQUIPMENT LEASED TO OTHERS			
19	PROPERTY, PLANT AND EQUIPMENT - GROSS	47	905	8.1%
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	28	792	7.1%
21	PROPERTY, PLANT AND EQUIPMENT - NET	19	113	0.9%
22				
23	TOTAL ASSETS	34	243	1.3%
24				
25	NOTES PAYABLE TO U.S. BANKS			
26	NOTES PAYABLE TO CANADIAN BANKS			
27	COMMERCIAL PAPER			
28	DRAFTS PAYABLE			
29	CURRENT INSTALLMENTS ON LONG-TERM DEBT			
30	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	3	703	0.5%
31	PRODUCTION PAYMENTS - NET OF TAXES	14	321	9.9%
32	ACCRUED SALARIES AND WAGES	1	279	5.7%
33	U.S. AND CANADIAN INCOME TAXES	1	392	5.5%
34	CUSTOMERS' DEPOSITS			
35	DIVIDENDS PAYABLE			
36	INTERCOMPANY PAYABLES		75	0.8%
37				
38	TOTAL CURRENT LIABILITIES	20	772	2.5%
39	LONG-TERM DEBT (LESS CURRENT PORTION)			
40	OTHER LIABILITIES			
41	DEFERRED REVENUE FROM ASSIGNED LEASES			
42	DEFERRED INCOME TAX	1	801	9.1%
43	MINORITY INTERESTS			
44	INTERDIVISION ACCOUNTS			
45				
46	UNREALIZED PROFIT - INTERCOMPANY			
47	- INTERDIVISION			
48				
49	SHARE OWNER'S EQUITY			
50	CAPITAL STOCK		83	99.5%
51	TREASURY STOCK			
52	CAPITAL SURPLUS			
53				
54	EARNED SURPLUS, BEGINNING OF YEAR	10	812	1.2%
55	NET INCOME (LOSS)		792	1.5%
56	DIVIDENDS - CAPITAL STOCK			
57				
58	EARNED SURPLUS, END OF PERIOD	11	605	1.8%
59	TOTAL SHARE OWNERS' EQUITY	11	688	1.6%
60	TOTAL LIABILITIES AND EQUITY	34	243	1.3%

1766 Nugent Dep Ex, 11, Ig.
9/10/68
Pinkerton 2

GOVERNMENT EXHIBIT
Nug. Dep.
16

GMSZ
1601

1967 KEYSTONE COAL BUYERS MANUAL

A McGraw-Hill Publication
© Copyrighted 1967 McGraw-Hill, Inc.
Printed in U. S. A.

Price $45.00 per copy

McGraw-Hill Mining Publications
Coal Age—Engineering & Mining Journal—Metals Week
Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

JOHN R. EMERY, Publisher
Mining Publications

ALFRED E. FLOWERS, Editor
Keystone Coal Buyers Manual
Coal Age

GEORGE F. NIELSEN, General Manager
Keystone Coal Buyers Manual
Coal Mine Directory
Monthly News Bulletin Service

McGRAW-HILL, INC.
330 West 42d St., New York, N.Y. 10036

1767

Deep Mined Co[illegible]

No. 6 Seam in Southern and Centr[illegible]

distinguished for their basic character and excellent preparation for electric utility, industrial, metallurgical and heating uses

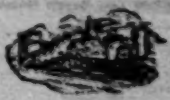
ORIENT NO. 8

Shipping point Orient Mine No. 3, Illinois. Daily capacity 14,000 tons. One of the largest mines in the country. Famed for quality and excellence of preparation. The lowest ash low sulphur coal in Illinois for metallurgical, electric utility, industrial and heating applications. Extensive reserves.

ORIENT NO. 4

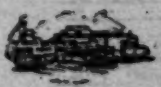
Shipping point Orient Mine No. 4, Illinois. Daily capacity 7,000 tons. A special feature of this mine is its attractive glossy-black, firm structure coal, unusually low in moisture and high in Btu content. A popular dealer coal as well as a long-time favorite with utilities and industries.

ORIENT NO. 5



Shipping point West Frankfort, Illinois. Daily capacity 7,000 tons. Freeman's newest mine, highly automated for unusually precise control of both quality and sizing. Orient No. 5 coal is a low moisture, high Btu product, highly desirable for utility, industrial and heating uses.

CROWN MINE



Shipping point Crown, Illinois. Daily capacity 10,000 tons. The largest air-cleaning plant in the country plus unusually versatile preparation facilities capable of meeting varied market requirements. Crown coal is widely used by utilities and industries, and also has a large and loyal dealer following.

Distributors of Choice High and Low Volatile Coals from Eastern Kentucky and West Virginia

FREEMAN COAL MINING CORPORATION

A DIVISION OF GENERAL DYNAMICS CORPORATION / [illegible]

1623
GOVERNMENT EXHIBIT
Aug. Exp. 17

1967 KEYSTONE COAL BUYERS MANUAL

A McGraw-Hill Publication
© Copyrighted 1967 McGraw-Hill, Inc.
Printed in U. S. A.

Price $45.00 per copy

McGraw-Hill Mining Publications
Coal Age—Engineering & Mining Journal—Metals Week
Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

JOHN B. EMERY, Publisher
Mining Publications

ALFRED E. FLOWERS, Editor
Keystone Coal Buyers Manual
Coal Age

GEORGE P. NIELSEN, General Manager
Keystone Coal Buyers Manual
Coal Mine Directory
Monthly News Bulletin Service

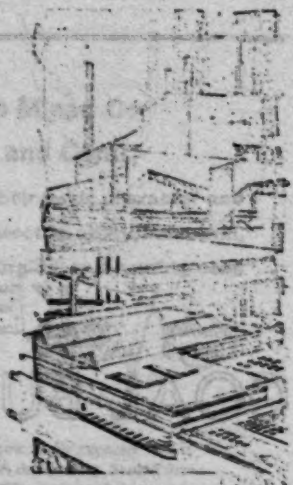
McGRAW-HILL, INC.
330 West 42d St., New York, N.Y. 10036

BY BARGE on the Inland Waterways

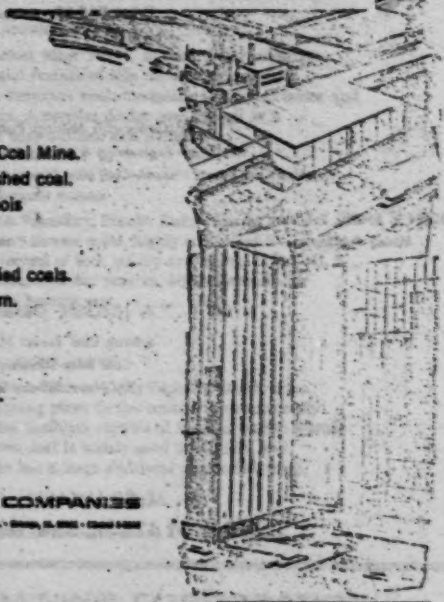
BY LAKE VESSEL to Great Lakes Ports

BY RAIL to all Middle West Points

BY TRUCK for Local Area Delivery



UNITED ELECTRIC COALS for
ELECTRIC UTILITIES and BASIC INDUSTRIES



BANNER– Direct Barge-Loading Coal Mine.
Premium quality heavy media washed coal.
Banner Seam, Peoria County, Illinois

CUBA-SUCKHEART
Heavy media, washed and heat dried coals.
Fulton County, Illinois, No. 5 Seam.

FIDELITY
Washed and heat dried coals.
Perry County, Illinois, No. 6 Seam.

THE UNITED ELECTRIC COAL COMPANIES
A DIVISION OF GENERAL DYNAMICS CORPORATION/30 S. Wacker Dr. • Chicago, IL 60606 • (312) 750-2600

GOVERNMENT
Aug. Dep.
19

1968 KEYSTONE COAL BUYERS MANUAL

A McGraw-Hill Publication

© Copyrighted 1968 McGraw-Hill, Inc.
Printed in U. S. A.

Price $60.00 per copy

McGraw-Hill Mining Publications
Coal Age—Engineering & Mining Journal—Metals Week
Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

JOHN R. EMERY, Publisher
Mining Publications

ALFRED E. FLOWERS, Editor
Keystone Coal Buyers Manual
Coal Age

GEORGE F. NIELSEN, General Manager
Keystone Coal Buyers Manual
Coal Mine Directory
Monthly News Bulletin Service

McGRAW-HILL, INC.
330 West 42d St., New York, N.Y. 10036

UNITED ELECTRIC COALS
for Electric Utilities and Basic Industries

by Barge on Inland Waterways
by Rail to Middle West Points
by Truck for Local Area Delivery

BANNER MINE PEORIA COUNTY, ILLINOIS

Shipping point Banner, Illinois. Banner No. 2 Seam. Daily capacity 4,000 tons. A direct barge-loading mine, producing heavy medium washed coal for commercial, industrial, and heating markets.

FIDELITY MINE PERRY COUNTY, ILLINOIS

Shipping point Pinckneyville, Illinois. No. 6 Seam. Daily capacity 8,000 tons. An unusually versatile preparation plant producing required sizes of washed and heat-dried coal.

BUCKHEART MINE FULTON COUNTY, ILLINOIS

Shipping point Canton, Illinois. No. 5 Seam. Daily capacity 9,000 tons. A heavy medium preparation plant with its own rail facilities to transport coal to barge-loading dock at Liverpool.

CUBA MINE FULTON COUNTY, ILLINOIS

Shipping points Cuba and Lewistown, Illinois. No. 5 Seam. Daily capacity 4,500 tons. Produces high quality washed and heat-dried coals primarily for electric utilities and industries.

THE UNITED ELECTRIC COAL COMPANIES

A SUBSIDIARY OF GENERAL DYNAMICS CORPORATION/ 307 N. Michigan Ave. • Chicago, Ill. 60601 • Telex 2-4369

1772
Nigeria Dig. Ex. 20, Id. 9/16/68
1772
GOVERNMENT EXHIBIT
Aug. Dep.
20

CHICAGO/NEW YORK THE BLACK DIA[illegible]

FEBRUARY, 1968
Our 83rd year

ndustry Matched Quality Coals from CAPITOL FUEL

Supplier of Quality Coal for 49 years

THE CAPITOL FUEL COMPANY

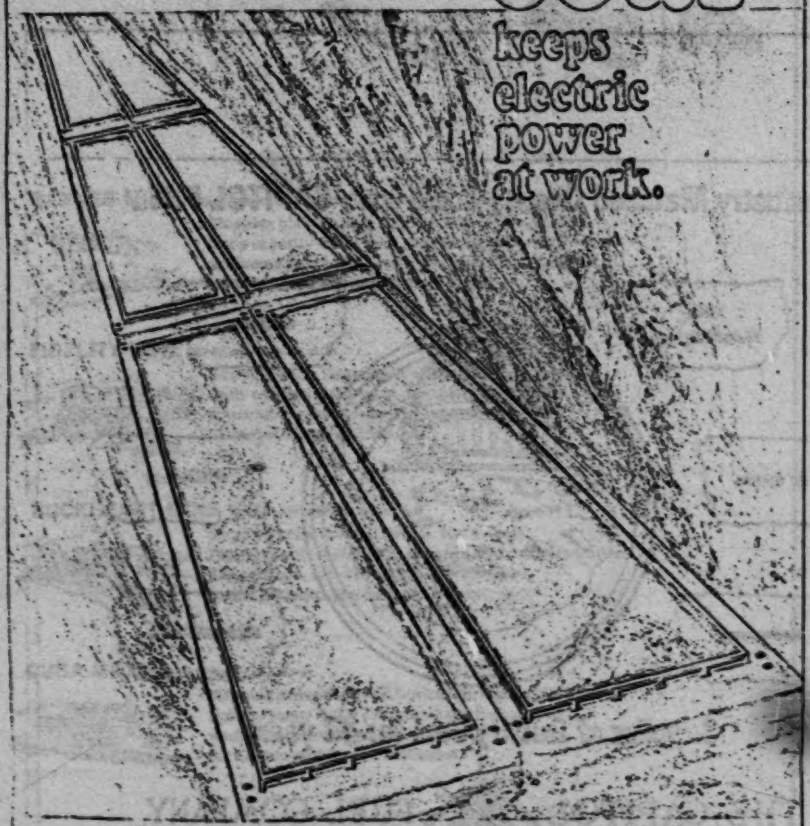
Leader Building

Cleveland, Ohio 44114
Telephone: 621-2600
Area Code: 216

Huge production facilities at four mines and flexibility of distribution keynote United Electric's efficient, dependable service to electric utilities and industries. Shipments by the economical all-water route on the inland waterways and by rail. You can be sure of large tonnages for the big job coal's got to do—today and tomorrow.

united electric coal

keeps electric power at work.



THE UNITED ELECTRIC COAL COMPANIES

A SUBSIDIARY OF GENERAL STEAMSHIP CORPORATION / 327 S. Michigan Ave. • Chicago, Ill. 60604 • Cable 6-4600

GOVERNMENT EXHIBIT Bus. Dep. 22

KIRKLAND, ELLIS, HODSON, CHAFFETZ & MASTERS
PRUDENTIAL PLAZA
CHICAGO, ILLINOIS 60601
TELEPHONE RANDOLPH 6-6600

WASHINGTON OFFICE
WORLD CENTER BUILDING

February 13, 1968

Xerox copy file

John T. Cusack, Esquire
Attorney, Midwest Office
Antitrust Division
Department of Justice
Room 2634 United States Courthouse
219 South Dearborn Street
Chicago, Illinois 60604

Re: United States v. General Dynamics, et al.

Dear Mr. Cusack:

Enclosed herewith is a statement, compiled from the stock records of The United Electric Coal Companies showing the amount of dividends paid by UEC to Material Service Corporation, General Dynamics Corporation and Freeman Coal Mining Corporation for the period January 1, 1950 to December 27, 1967.

We understand that this is the information requested by Paragraph 18 of your draft motion for production of documents and our conference on December 11, 1967.

Very truly yours,

Reuben L. Hedlund

RLH:ew
Enclosure

61-1-37-1
DEPARTMENT OF JUSTICE
FEB 14 1968
DIVISION OF RECORDS

THE UNITED ELECTRIC COAL COMPANIES

DIVIDENDS PAID ON THE COMMON STOCK OF THE UNITED ELECTRIC COAL COMPANIES BY YEAR TO MATERIAL SERVICE CORPORATION, GENERAL DYNAMICS CORPORATION, AND PEABODY COAL MINING CORPORATION FOR THE PERIOD JANUARY 1, 1950 TO DECEMBER 27, 1967.

YEAR	AMOUNT OF DIVIDENDS PAID TO MATERIAL SERVICE CORP.	GENERAL DYNAMICS	PEABODY COAL	TOTAL
1966	$ 456,844.05	$ 6,043,650.00	-	$ 6,500,494.05
1965	609,125.40	29,160.00	-	638,285.40
1964	609,125.40	29,160.00	-	638,285.40
1963	418,145.40	29,160.00	-	447,305.40
1962	406,530.25	28,350.00	-	434,880.25
1961	371,684.80	25,920.00	-	397,604.80
1960	371,684.80	12,400.00	-	384,084.80
1959	295,996.80	-	-	295,996.80
1958	265,060.80	-	-	265,060.80
1957	234,846.35	-	-	234,846.35
1956	161,963.00	-	-	161,963.00
1955	142,147.25	-	-	142,147.25
1954	20,675.00	-	-	20,675.00
1953	-	-	-	-
1952	-	-	-	-
1951	-	-	-	-
1950	-	-	-	-
TOTAL	$ 4,363,829.30	$ 6,197,800.00	-	$ 10,561,629.30

...ant Deposition ... page 29

ANNUAL ...

THE ... ELECTRIC RAIL ROAD COMPANY

JOHN E. AMES
Chicago, Illinois

...VING ...WN
Chica... Illinois

MILTON ...NOFF
Chicago, Illinois

BARTON R. GEBHART
Chicago, Illinois

DUDLEY F. JESSOPP
Chicago, Illinois

JOHN M. MORRIS
Chicago, Illinois

FRANK NUGENT
Chicago, Illinois

THOMAS J. TARRY
Chicago, Illinois

REUBEN THORSON
Chicago, Illinois

OFFICERS

JOHN M. MORRIS
President

R. J. HEPBURN
Vice President—Operations

THOMAS J. TARRY
Vice President—Sales

G. H. UTTERBACK
Secretary

JOHN T. MURRAY
Treasurer

WILLIAM B. HAUBOLD
Controller

CARL A. HOLM
Assistant Treasurer

G. A. ALDERSON
Assistant Secretary

RESULTS ... OPERATIONS
YEAR ENDED JULY 31

	[illegible]	1[illegible]
...ES		
...ed	$22,281,250	$19,904,888
Tonnage	5,584,151	4,947,875
INCOME		
Amount	$ 3,533,349	$ 2,844,402
Percentage of sales	[illegible]%	15.3%
Per share	$ [illegible]	$ 3.02
DIVIDENDS		
Amount	$ 1,[illegible]3,050	$ 1,213,050
Per share	$ 1.50	$ 1.50
WORKING CAPITAL		
At year end	$ 3,3[illegible],436	$ 2,880,987
LONG-TERM DEBT		
At year end	$ -	$ 615,500
STOCKHOLDERS' EQUITY		
Equity at year end	$27,[illegible]37,539	$24,703,350
Per share	$ [illegible]	$ 26.26
Number at year end	1,[illegible]	1,515
EMPLOYEES		
Number at year end	378	454
Average hourly earnings	$ 4.[illegible]	$ 3.58

TRANSFER AGENT: The Chase Manhattan Bank
REGISTRAR: Continental Bank New York Trust Company

EXECUTIVE OFFICES: 69 W. WASHINGTON ST., CHICAGO 2, ILL. • 677 CHICAGO, ILL.; ST. LOUIS, MO.; PEORIA, ILL.
...NOIS BANNER: GLENCOE, ILL. • GLENBARD CARTON, ILL. • ... ILL. • ...ITY: DU QUOIN, ILL. • MARY MOORE: DANVILLE, ILL.

...ORATIONS IN THE ... TRANSPORTATION ...
...DUSTRIAL DEVELOPMENT ... MANUFACTURING ...

PRESIDENT'S LETTER TO STOCKHOLDERS

1964 was a very good year for your Company, as you will see from the following pages. Good operating conditions at all of our mining properties contributed substantially to the results. Increased sales to our customers made it possible to produce a record of 5,562,886 tons. Details of the year's results are presented under "Review of the Year."

Wherever possible, we continue to reclaim land which has been mined and put it to the use for which it is best adapted. Color photographs on the cover of this report show some of the recreational facilities that have been established and are being used.

Most of the responsible strip coal mine operators are doing this. The enclosed brochure produced by the Mined Land Conservation Conference shows the variety and extent of land reclamation activities in many states. Your Company is a member of the Conference and contributes both time and money as well as the talents of our organization to this work.

The coal industry must continue to support every effort to maintain and increase its proportion of the energy market. This will require the use of every means of reducing mining costs and the full cooperation of all transportation agencies to achieve the lowest possible delivered costs at point of use. We believe that our competitive position can be maintained in the territory served by your Company.

Approximately 60% of our production is shipped via the inland waterways. Railroads are making a determined effort to compete with water-borne coal and substantial reductions in their freight rates have been made in recent months. We continue to watch this development closely and endeavor to retain our competitive relationship in the market areas served by our mines.

Sales and production at all of our properties continue currently on a very satisfactory basis and we are optimistic about the future of the coal industry.

We have always had the full and sincere cooperation of our entire organization and we are grateful to our shareholders, members of our Board of Directors, and all employes for their interest and efforts on behalf of the Company.

Respectfully submitted,

John M Mem

President

September 11, 1964

New heat dryer unit at Fidelity Mine reduces moisture content of the coal and [illegible]

REVIEW OF THE YEAR

Sales of the Company were the highest on record – $22,391,226. Net income was $3,233,343, equivalent to $4.80 per share. Progress over the past ten years is shown on Page 12 and inside back cover of this Annual Report.

At the end of our fiscal year 1963, bank loans amounted to $1,708,199 and all of this was retired during the year ended July 31, 1964.

The dividend rate of $1.60 per share annually was continued throughout the past year.

CAPITAL ADDITIONS A new heat dryer was installed at the Fidelity Mine and started operating in February of 1964. This dryer removes the excess moisture from the washed coal, increasing the heating value and avoiding the extreme difficulties of unloading frozen coal in severe winter weather. Prior to the installation of the dryer, our shipments from Fidelity Mine were seriously curtailed during extremely low temperatures and this will now be avoided. The dryer has performed in a very satisfactory manner and completely in accord with our expectations.

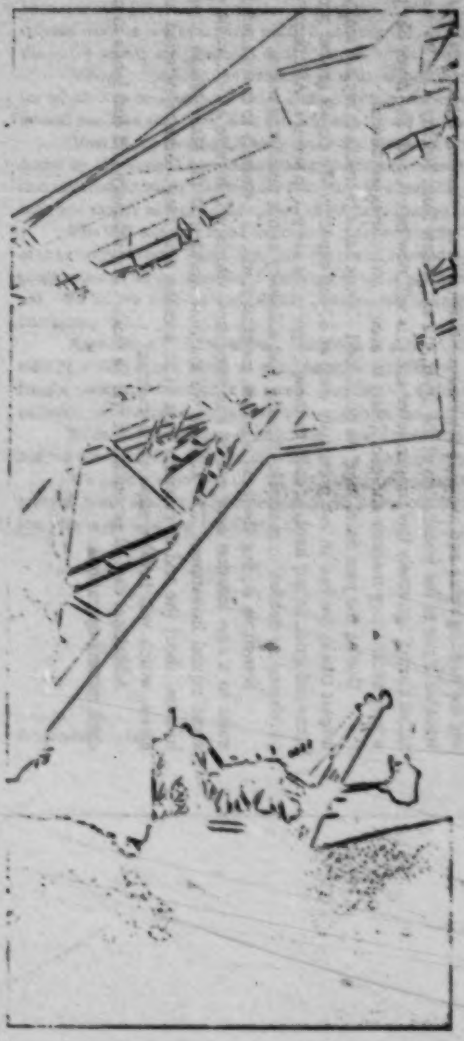
During the past fiscal year, we purchased 100-ton haulage trucks to replace smaller units. The largest trucks we had in use previously were of 60-ton capacity. We expect greater production and some reduction in our haulage costs as these larger units are put in service. Additional units will be purchased as needed to maintain capacity and efficiency at our producing mines.

Sometime during the next eighteen months, it will be necessary to move some heavy equipment to a new location near one of our properties, which will involve considerable expense and some capital investment. The acreage we are now working at the Mary Moore Mine will be exhausted about the end of calendar year 1964 and the equipment there transferred to other properties, which will involve expense in moving.

Additional capital expenditures will be made for machinery and coal lands to maintain efficient mining operations.

1778

PRODUCTION OF UNITED ELECTRIC COALS

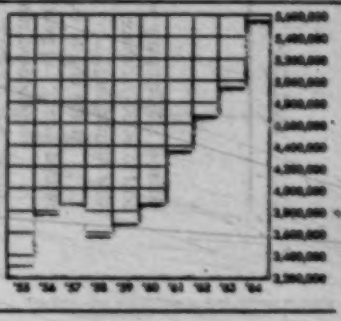


As indicated below, our production has continued to grow year by year, showing an increase of 12¼ % for the year ended July 31, 1964 over the previous fiscal year ended July 31, 1963.

BY MINES—TONS

		1963
Cuba	840,871	804,980
Buckheart	1,848,864	1,330,455
Fidelity	1,899,040	1,904,447
Banner	717,094	008,158
Mary Moore	983,937	395,583
	5,588,868	4,946,583

BY YEARS—TONS

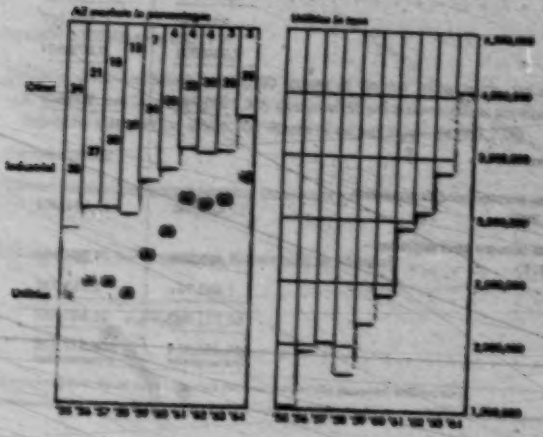


COAL DEPOSITS At the year end July 31, 1964, our total recoverable tonnage was 143,400,000 tons, of which 95,500,000 tons are suitable for mining by the strip method and 48,900,000 tons of underground coal. During the fiscal year, we added to our available strip acreage just about the amount produced by all of our mines.

CHANGE IN FISCAL YEAR For some time it has appeared desirable to change our fiscal year end from July 31 to December 31. This will make it easier to comply with the requirements of various governmental bureaus and to compare results of the Company with those of other coal producers and industries. The change was authorized by the Board of Directors during the past fiscal year. The interim statement for the five months period ending December 31, 1964 will be sent to our shareholders and also incorporated in our Annual Report for the calendar year 1965, which will be our next fiscal year.

PERSONNEL Without loss of working time, an amended wage agreement was negotiated last spring with the United Mine Workers of America whereby wages were increased $1.00 per day on April 2, 1964 and an additional $1.00 per day on January 1, 1965. Vacation pay was increased from $200 to $225 beginning with payments in June, 1964. The new agreement is terminable on sixty days' notice by either party on or after March 31, 1968.

CONSUMPTION OF UNITED ELECTRIC COALS



Practically our entire increase in sales last year occurred in shipments to public utilities. 75% of our production was sold in this market, 18% to industrial consumers, and the balance of 3% to others. We continue to direct our sales efforts toward maintaining and increasing our proportion of the utility and industrial market.

BALANCE SHEET JULY 31, 1964 AND 1963

ASSETS

	JULY 31	
	1964	1963
CURRENT ASSETS:		
Cash	$ 1,593,607	$ 1,339,507
Bank certificates of deposit	2,000,000	—
Accounts receivable (less allowance for possible losses, $50,000)	1,885,976	1,787,276
Inventories:		
Coal on hand, at lower of cost or market	196,259	269,817
Drilling, blasting, and stripping costs of coal in process of being mined, at average cost	386,830	409,343
Repair parts, operating supplies, etc., at average cost or lower (less allowance for obsolescence, $70,000)	1,641,111	1,580,507
Total inventories	2,224,200	2,249,667
Prepaid expenses	275,820	496,117
Total current assets	7,589,603	5,972,657
INVESTMENTS, ETC.	755,784	755,809
PROPERTY, PLANT, AND EQUIPMENT:		
Buildings, machinery, etc., at cost (less accumulated depreciation—1964, $21,834,445; 1963, $19,061,380)	11,626,501	13,004,063
Coal lands and rights, etc., at cost (less accumulated depletion—1964, $6,127,858; 1963, $5,912,417)	7,602,295	7,564,853
Advance mining royalties—net	1,482,731	1,013,737
	20,711,527	21,582,653
TOTAL	$29,456,914	$28,311,119

LIABILITIES

	JULY 31	
	1954	1953
CURRENT LIABILITIES:		
Notes payable	$ –	$ 1,212,748
Accounts payable and accrued expenses	736,666	802,817
Federal income taxes	917,181	341,453
Accrued salaries and wages, etc.	472,534	431,388
Dividends payable	303,264	303,264
Total current liabilities	2,429,645	3,091,670
NOTES PAYABLE, ETC.	–	515,599
STOCKHOLDERS' EQUITY:		
Common stock—authorized, 750,000 shares of $5 par value each; issued 677,920 shares (including 306,000 shares of $5 par value each at previous aggregate stated value of 306,000 shares of no par value, $4,657,318)	6,516,918	6,516,918
Capital surplus	1,350,691	1,350,691
Earned surplus, per accompanying statement	19,344,885	16,921,466
	27,121,494	24,798,075
Deduct—cost of 4,000 common shares held in treasury	94,225	94,225
	27,027,269	24,703,850
TOTAL	$29,456,914	$28,311,119

The notes appearing on page 11 are an integral part of the financial statements.

STATEMENT OF INCOME AND EARNED SURPLUS

THE UNITED ELECTRIC COAL COMPANIES
FOR THE YEARS ENDED JULY 31, 1964 AND 1963

	YEAR ENDED JULY 31	
	1964	1963
Sales—Net	$22,391,226	$19,904,586
Operating Costs and Expenses (exclusive of depreciation and depletion):		
Cost of mining	13,493,460	12,508,026
Selling, general, and administrative expenses	1,080,757	1,103,481
	14,574,217	13,611,507
Profit from Operations, before Deducting Depreciation and Depletion	7,817,009	6,293,079
Deduct:		
Depreciation	3,127,923	3,059,585
Depletion	233,241	189,882
	3,361,164	3,249,467
Profit from Operations	4,455,845	3,043,612
Income Charges and Credits:		
Provision for Federal income taxes (1963, after reduction of $125,000 shown below)	1,375,000	760,000
Interest expense	38,915	125,563
Profit on sale of equipment (less applicable income taxes, $125,000)	—	*369,550*
Other income charges and credits—net	*192,418*	*116,802*
	1,222,497	399,210
Net Income for the Year	3,233,348	2,644,402
Earned Surplus at Beginning of the Year	16,921,466	15,490,120
Investment Credit Applicable to Prior Years	303,127	—
	20,457,941	18,134,522
Deduct—Dividends ($1.80 per share)	1,213,056	1,213,056
Earned Surplus at End of the Year	$19,244,885	$16,921,466

NOTES

1. INVESTMENTS Included in investments is the cost, $730,000, of the Company's investment in capital stocks of affiliates engaged in barge operations. The Company's equity in the combined net assets of these affiliates at the close of their fiscal year exceeded its investments therein. These barge affiliates had loans of $3,483,245 at July 31, 1964 and the owners of these affiliates in effect guarantee that the revenues will be sufficient to repay the instalments of these loans. In connection with such guarantee, the Company has also agreed to maintain working capital of $1,750,000. At July 31, 1964, the Company had working capital of $5,559,958.

2. INVESTMENT CREDIT Investment credit applicable to prior years, which had been treated as a reduction of property at July 31, 1963, has been reversed in 1964 and credited to earned surplus.

3. COMMITMENTS At July 31, 1964, the Company had commitments of approximately $2,450,000 for advance royalty payments on long-term coal leases and $950,000 for future payments on option contracts to purchase coal lands, of which approximately $850,000 is payable in the twelve months ending July 31, 1965.

ACCOUNTANTS' REPORT

THE UNITED ELECTRIC COAL COMPANIES:

We have examined the balance sheet of The United Electric Coal Companies as of July 31, 1964 and the related statement of income and earned surplus for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and statement of income and earned surplus present fairly the financial position of the Company at July 31, 1964 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS
Certified Public Accountants

Chicago, September 11, 1964

GOVERNMENT EXHIBIT
Dep. Dep.
55 B

GENERAL DYNAMICS CORPORATION
ONE ROCKEFELLER PLAZA
NEW YORK, N. Y. 10020

INVITATION FOR TENDERS
OF COMMON STOCK OF
THE UNITED ELECTRIC COAL COMPANIES
AT $50.00 PER SHARE

To the Holders of Common Stock of
THE UNITED ELECTRIC COAL COMPANIES:

General Dynamics Corporation ("General Dynamics") invites the holders of Common Stock of The United Electric Coal Companies ("UEC"), upon the terms and conditions set forth in this Invitation, in the enclosed Form of Tender and Assignment and on the reverse thereof, to tender shares of Common Stock of UEC for purchase by General Dynamics at the price of $50.00 per share in cash, net to the seller. No charges for brokers' commissions or state transfer taxes will be made to stockholders of UEC for transfer of their shares to General Dynamics.

General Dynamics will pay to any member of a registered national securities exchange or of the National Association of Securities Dealers, Inc. whose name appears on the Form of Tender and Assignment as soliciting broker a fee of 50¢ per share for each share tendered thereby and purchased pursuant to this Invitation for Tenders.

This offer expires at 5:00 p.m., Eastern Daylight Saving Time, on Tuesday, October 25, 1966, and tenders must be received at the office of The Chase Manhattan Bank (National Association), Tender Agent, 80 Pine Street, 2nd Floor, New York, N. Y., on or before said date, provided, however, that General Dynamics may, at its option, by notice to the Tender Agent, extend the period for tenders from time to time until not later than Monday, November 21, 1966.

If 170,000 or more shares are properly tendered prior to the expiration of the initial or extended tender period, General Dynamics will be obligated, subject to the conditions hereof, to purchase all shares tendered.

Whether or not the period for tenders is extended, if less than 170,000 shares are tendered during the period within which tenders may be made, General Dynamics is not obligated to purchase any of the shares tendered, but it reserves the right to purchase all or any part of the shares tendered. If General Dynamics purchases fewer than all such shares tendered, purchases will be prorated and the same proportion of shares will be purchased from each tendering stockholder (except that, in the event that proration of shares tendered will result in a return of ten shares or less to any stockholder, General Dynamics reserves the right to retain and purchase all such shares). Any proration will be effected in such a way as to eliminate the purchase of fractional shares.

All tenders are irrevocable until the shares are purchased or returned as provided in this Invitation for Tenders. In order to take advantage of this offer stockholders of UEC should act promptly. You should either:

1. Send the enclosed Form of Tender and Assignment properly filled out, executed and accompanied by your stock certificate(s) and any necessary supporting documents, as set forth in the instructions on the reverse of the Form of Tender and Assignment, to The Chase Manhattan Bank (National Association), Corporate Agency Department, 80 Pine Street, 2nd Floor, New York, N. Y. 10015 (registered mail is suggested); or

2. Request your broker or bank to complete the transaction for you.

GOVERNMENT EXHIBIT Bldg. Dep. 35 b

Payment for shares purchased pursuant to this invitation will be made promptly after expiration of the tender period. General Dynamics reserves the right to reject any alternative, conditional or contingent tenders.

At December 31, 1965, directors of UEC as a group owned 2,400 shares of Common Stock of UEC; such directors are eligible to participate in this offer.

General Dynamics owns 445,773 shares of Common Stock of UEC, which is 66.15% of the outstanding shares. General Dynamics first acquired ownership of UEC shares through its acquisition on December 31, 1959 of Material Service Corporation, which then owned 232,303 such shares. Since that date General Dynamics has from time to time acquired 213,470 additional shares, either on the open market or by privately negotiated purchases, at prices ranging from $31.125 to $50.50 per share and averaging $45.83 per share.

If General Dynamics acquires 165,000 shares or more of UEC Common Stock it will own in excess of 90% of the outstanding stock of UEC, and presently intends to acquire complete ownership of the business of UEC. Under the laws of Delaware, in which UEC is incorporated, a corporation owning 90% or more of the shares of another corporation may merge the latter into itself by filing a certificate of ownership and merger authorized by the board of directors of the parent corporation. If such action is taken the certificate would specify the cash or other consideration to be paid upon the surrender of the shares held by the minority. Any stockholder objecting to such a merger and demanding payment for his stock as provided in Section 253(e) of the Delaware General Corporation Law would be entitled to be paid the value of his stock on the date of the recording of the certificate, exclusive of any element of value arising from the expectation or accomplishment of the merger, all as provided in said Section 253(e).

Currently the number of publicly held shares of UEC fails to meet the New York Stock Exchange criterion for continued listing. The Exchange has informed UEC that October 24, 1966 has been tentatively set as the date when trading in UEC stock on the Exchange will be suspended.

Business and Operations of The United Electric Coal Companies

UEC is engaged in the production and sale of bituminous coal which is marketed in the Chicago, St. Louis and other Midwestern industrial areas.

The following summary of earnings of UEC for the years 1961 through 1965 has been prepared from the financial information contained in UEC's 1965 Annual Report to Stockholders. The information set forth for the nine-month periods ended September 30, 1965 and 1966, has not been audited, but in the opinion of UEC's management presents fairly the results of operations for such periods. Reference is made to the balance sheet of UEC at December 31, 1965, which was included in the 1965 Annual Report, and the unaudited balance sheet at September 30, 1966, and related notes, all of which are appended hereto. Copies of such 1965 Annual Report will be sent upon request.

SUMMARY OF EARNINGS

	Fiscal Year Ended July 31			Year Ended Dec. 31		Nine Months Ended September 30 (Unaudited)	
	1961	1962	1963	1964	1965	1965	1966
	(In Thousands, except per share amounts)						
Net Sales	$16,133	$19,006	$19,900	$23,196	$25,004	$15,676	$17,309
Earnings Before Income Taxes	3,430	3,581	3,529	5,054	5,410	3,110	3,794
Provision for Income Taxes	1,680	1,650	885	1,372	930	585	1,100
Net Earnings	1,630	1,931	2,644	3,679	4,480	1,525	2,694
Depreciation and Depletion	1,790	2,850	3,340	3,500	3,650	2,304	2,699
Per Share of Common Stock:							
Net Earnings	$ 2.39	$ 2.61	$ 3.55	$ 5.16	$ 6.65	$ 2.26	$ 3.79
Dividends Paid	1.60	1.65	1.80	1.80	1.80	1.35	1.35
Stockholders' Equity	38.89	34.83	36.66	41.77	48.62	43.66	45.53

TEN YEAR RECORD OPERATING AND FINANCIAL DATA

THE UNITED ELECTRIC C

	Tons Produced and Sold	Net Sales	Depreciation and Depletion	Earnings Before Income Taxes	Provision for Income Taxes	Net Earnings	Shares of Common Stock Outstanding	Per Share of Common Stock: Earnings	Per Share of Common Stock: Dividends Declared	Per Share of Common Stock: Stockholders' Equity	Working Capital	Coal Lands, Plant and Equipment, Less Depreciation and Depletion	Long-te... Indebted...
1964	5,584,151	$22,391,226	$3,361,164	$4,608,348	$1,375,000	$3,233,348	673,920	$4.80	$1.80	$40.10	$5,559,958	$20,711,527	$ –
1963	4,947,875	19,904,586	3,249,467	3,529,402	885,000	2,644,402	673,920	3.92	1.80	36.66	2,880,987	21,582,653	515,5
1962	4,633,630	19,055,659	2,859,346	3,505,236	1,050,000	2,455,236	673,920	3.64	1.70	34.53	3,190,498	21,140,096	1,989,7
1961	4,343,530	18,135,466	1,699,882	3,629,853	1,000,000	2,629,853	673,920	3.90	1.60	32.59	3,284,855	20,334,453	2,442,5
1960	3,839,634	16,021,572	1,524,827	2,342,472	480,000	1,862,472	673,920	2.76	1.60	30.29	3,026,638	20,105,940	3,380,5
1959	3,699,677	15,770,289	1,551,849	2,611,313	800,000	1,811,313	673,920	2.69	1.60	29.12	2,772,358	16,684,704	1,200,0
1958	3,591,909	15,454,725	1,590,948	2,335,664	787,000	1,548,664	673,920	2.30	1.60	28.04	2,538,648	15,361,414	–
1957	3,890,842	16,300,572	1,678,375	3,004,006	960,000	2,044,006	677,220	3.02	1.30	27.32	3,438,544	13,298,913	180,0
1956	3,789,349	14,960,424	1,421,641	2,311,556	650,000	1,661,556	677,920	2.45	1.00	25.60	3,179,295	13,204,764	–
1955	3,325,759	12,476,899	1,378,718	897,332	212,400	684,932	67...		1.00	24.15	2,516,334	13,704,308	573,1

RECORD OPERATING AND FINANCIAL DATA

THE UNITED ELECTRIC COAL COMPANIES

	Depreciation and Depletion	Earnings Before Income Taxes	Provision for Income Taxes	Net Earnings	Shares of Common Stock Outstanding	Per Share of Common Stock: Earnings	Per Share of Common Stock: Dividends Declared	Per Share of Common Stock: Stockholders' Equity	Working Capital	Coal Lands, Plant and Equipment, Less Depreciation and Depletion	Long-term Indebtedness	Net Assets	Coal Deposits —Tons
,226	$3,361,164	$4,608,348	$1,375,000	$3,233,348	673,920	$4.80	$1.80	$40.10	$5,559,958	$20,711,527	$ —	$27,027,289	143,400,000
,586	3,249,467	3,529,402	885,000	2,644,402	673,920	3.92	1.80	36.66	2,880,967	21,582,653	515,599	24,703,850	127,700,000
,659	2,859,346	3,505,236	1,050,000	2,455,236	673,920	3.64	1.70	34.53	3,190,428	21,140,096	1,929,701	23,272,504	123,300,000
,[illegible]	1,699,882	3,629,853	1,000,000	2,629,853	673,920	3.90	1.60	32.59	3,284,855	20,334,453	2,442,545	21,962,933	121,600,000
,573	1,524,827	2,342,472	480,000	1,862,472	673,920	2.76	1.60	30.29	3,026,638	20,105,940	3,380,502	20,411,351	123,100,000
,289	1,551,849	2,611,313	800,000	1,811,313	673,920	2.69	1.60	29.12	2,772,358	16,684,704	1,200,000	19,627,151	124,500,000
,725	1,590,946	2,335,664	787,000	1,548,664	673,920	2.30	1.60	28.04	2,538,648	15,361,414	—	18,894,110	102,700,000
,572	1,678,275	3,004,006	960,000	2,044,006	677,220	3.02	1.30	27.32	3,438,544	13,298,913	180,000	18,500,970	86,600,000
,424	1,421,641	2,311,556	650,000	1,661,556	677,920	2.45	1.00	25.60	3,179,295	13,204,764	—	17,354,763	92,600,000
,889	1,378,718	897,332	212,400	684,932	67[illegible]	[illegible]	1.00	24.15	2,516,334	13,704,308	573,199	16,371,127	90,400,000

GOVERNMENT EXHIBIT
Nug. Dep.
35 c

In 1965 UEC produced and sold 5,409,815 tons of bituminous coal compared with 5,801,52[illegible] in 1964. Production during the first nine months of 1966 exceeded production for the comp[illegible] period in 1965 by 516,663 tons.

Earnings for 1965 declined from the prior year as a result of extraordinary expenses incurred in connection with closing the Mary Moore Mine (where the coal reserves were exhausted), moving heavy equipment to other operating properties and, at two of UEC's four other mines, developing new operating pits and moving from worked-out areas. In addition, in the Spring of 1965 record flood conditions on the Mississippi River curtailed sales and disrupted operations for approximately two months at one of UEC's principal mines. For the first nine months of 1966, however, net income was $2,493,986 compared to $1,524,908 for the first nine months of 1965.

In 1964 and 1965 UEC sold 73% of its production to electric utilities, 23% to industrial users and 4% to others, with two electric utilities accounting for approximately 38% of total sales. Approximately 63% of sales in 1965 were made under term contracts (almost all with electric utilities) which will expire at various dates from December 31, 1966 to December 31, 1970, and an additional 9% of 1965 sales were made under term contracts expiring on or before December 31, 1974. Substantially all sales to industrial users are under one-year contracts or on a spot basis except for two contracts, one for 275,000 tons per year expiring on May 31, 1970 and the other for 325,000 tons per year expiring on December 31, 1968.

UEC competes intensively with other coal producers. In addition, atomic energy is becoming a competitive source of energy for electric utilities, but no prediction is made herein as to the long-range effect which atomic energy will have on coal utilization in the Midwest. General Dynamics is actively engaged in commercial development of atomic energy.

During the period from January 1960 to September 1966, the average price of bituminous coal sold by UEC declined from $4.27 to $4.10 per ton, with sales to electric utilities being made at slightly lower prices than to industrial users; substantially all of this reduction, however, has been offset by operating efficiencies and lower freight rates.

UEC operates four open pit or strip mines located in Illinois as follows: Fidelity Mine in Perry County, whose output is transported to market by rail and barge; Cuba Mine in Fulton County, which is strategically located to serve the Peoria market; and Buckheart Mine in Fulton County and Banner Mine in Fulton and Peoria Counties, which also serve the Peoria market and in addition are located close to the Illinois River, making possible low-cost transportation to the Chicago area. In addition, UEC has underground coal deposits in Illinois and strip coal and underground deposits near Hayden, in Routt County, Colorado.

UEC states that at December 31, 1965, it had approximately 84,600,000 tons of coal reserves in Illinois suitable for strip mining. Of this total, approximately 72,100,000 tons are dedicated to UEC's four existing mines which, at UEC's 1965 annual rate of production, have remaining lives ranging from 8 to 16 years. UEC also had approximately 50,800,000 tons of underground coal deposits in Illinois, and other miscellaneous reserves of 7,000,000 tons, but has no present plans to mine such coal.

In light of the limited life of UEC's existing strip mining reserves in Illinois and the unavailability of additional strip mining reserves in the Midwest, UEC has been engaged in an exploration program in Colorado and other western states to secure strip mining coal reserves which can be developed by utilizing UEC's strip mining machinery and equipment. As a result of such exploration program, in addition to the reserves described above UEC states that it has acquired in Colorado an estimated 12,500,000 tons of coal reserves suitable for strip mining, and an undetermined amount of underground coal reserves the extent of which has not been explored. UEC has no coal operations in Colorado and has no plans to commence operations there until increased demand for coal in that area makes development of such

GOVERNMENT EXHIBIT Rue 35 Dep.

reserves commercially feasible. Accordingly the future commercial success of the exploration program and the development of the Colorado reserves is a matter of speculation.

Approximately half of UEC's strip coal deposits and substantially all its underground coal deposits are leased; the balance of such reserves is owned in fee. At December 31, 1965, UEC had commitments of approximately $1,900,000 for advance royalty payments on long-term leases and $600,000 for future payments on contracts to purchase coal lands; approximately $630,000 of the total commitments of $2,500,000 was payable in 1966. At September 30, 1966, such commitments amounted to approximately $1,600,000 for advance royalty payments and $600,000 for future payments on contracts to purchase coal lands.

From time to time UEC has transactions in the ordinary course of business with Freeman Coal Mining Corporation, a wholly owned subsidiary of General Dynamics. In 1965 UEC sold approximately $1,284,000 of coal through Freeman Coal and Freeman Coal sold approximately $200,000 of coal through UEC. All such transactions have been on customary trade terms. In addition, UEC and Freeman Coal are supplying coal on a joint basis to certain customers.

UEC delivers a portion of its coal production by barge utilizing the facilities of three companies which are 50% owned by UEC.

A 30-month agreement with the United Mine Workers of America was reached in the Spring of 1966. Although the agreement will result in increased labor costs, UEC's term sales contracts contain escalation clauses so that the increased labor costs are not expected to have any material adverse effect upon UEC's earnings.

As set forth in its balance sheet as at September 30, 1966, UEC has issued 577,920 shares of Common Stock, of which 4,000 shares are held in treasury. Each share of Common Stock has the same rights and privileges; is entitled to one vote; participates equally in any dividends declared upon the Common Stock; and would participate equally in assets available for distribution to stockholders upon any liquidation, dissolution or winding-up. The Common Stock has no conversion or preemptive rights. The Transfer Agent for the Common Stock is The Chase Manhattan Bank (National Association).

Dividends have been paid on UEC Common Stock at the annual rate of $1.60 in 1961, $1.65 in 1962 and thereafter at the annual rate of $1.80. In connection with its guaranty of the obligations of certain affiliates, UEC has agreed to maintain working capital of $1,750,000 (at September 30, 1966, working capital was $11,134,822).

The following table sets forth the market prices of the Common Stock of UEC on the New York Stock Exchange:

Year or Period Ending	High	Low
1961	67½	44½
1962	64	41¾
1963	59	45¾
1964	55	44¾
1965	50¾	42¼
1966 (to September 30)	49¾	39½

On September 30, 1966, 100 shares of UEC Common Stock were traded on the New York Stock Exchange at $41¾ per share prior to the announcement of this tender offer. The last previous sale on the Exchange had taken place on September 22, 1966, when the closing price was $42¾.

GOVERNMENT EXHIBIT Misc. Exp. 35 a

General

General Dynamics may withdraw this Invitation, at its option, at any time during the initial or extended tender period, if a state of war has been declared by the United States, or if any banking moratorium or general suspension of trading on the New York Stock Exchange has been declared or if any legal action or proceeding shall have been instituted or threatened in any court or government agency against General Dynamics or UEC with regard to this tender offer.

General Dynamics makes no recommendation that stockholders of UEC tender or refrain from tendering all or any of their shares, and no one has been authorized to make any such recommendation. Each stockholder must make his own decision as to whether to tender shares and, if so, how many shares to tender.

Additional copies of this Invitation for Tenders and the Form of Tender and Assignment and UEC's Annual Report for 1965 can be obtained from The Chase Manhattan Bank (National Association), or at the following offices of Georgeson & Co.:

52 Wall Street
New York, N. Y. 10005

Republic Building
Cleveland, Ohio 44115

617 Land Title Building
Philadelphia, Pennsylvania 19102

41 Sutter Street
San Francisco, California 94104

208 South La Salle Street
Chicago, Illinois 60604

Penobscot Building
Detroit, Michigan 48226

140 Federal Street
Boston, Massachusetts 02110

650 South Spring Street
Los Angeles, California 90014

Dated: October 5, 1966.

GENERAL DYNAMICS CORPORATION

N-g. x 35 f, Ex. 9/4/63, 240-5

GOVERNMENT EXHIBIT Aug. Dec. 35

THE UNITED ELECTRIC COAL COMPANIES

BALANCE SHEET

December 31, 1965 and September 30, 1966

ASSETS

	December 31, 1965	September 30, 1966 (Unaudited)
CURRENT ASSETS:		
Cash	$ 1,766,345	$ 1,321,113
Bank certificates of deposit	3,675,000	5,975,000
Accounts receivable (less allowance for possible losses—1965, $50,000; 1966, $50,000)	2,596,400	2,617,185
Note receivable	—	1,000,000
Inventories:		
Coal on hand, at lower of average cost or market	102,025	63,710
Drilling, blasting, and stripping costs of coal in process of being mined, at average cost	391,507	470,001
Repair parts, operating supplies, etc., at average cost or lower (less allowance for obsolescence—1965, $100,000; 1966, $118,000)	1,802,138	1,794,990
Total inventories	2,295,670	2,328,701
Prepaid expenses	307,509	266,486
Total current assets	10,440,824	13,508,485
INVESTMENTS (Note 1)	755,383	753,885
PROPERTY, PLANT AND EQUIPMENT:		
Buildings, machinery, etc., at cost (less accumulated depreciation—1965, $25,367,105; 1966, $27,288,920)	10,699,788	9,051,940
Coal lands and rights, etc., at cost (less accumulated depletion—1965, $6,775,311; 1966, $7,204,793)	7,344,738	7,086,936
Advance mining royalties—net	2,232,670	2,655,356
	20,277,196	18,794,232
Total	$31,473,405	$33,056,602

GOVERNMENT EXHIBIT Bug. Dep. 35 8

THE UNITED ELECTRIC COAL COMPANIES

BALANCE SHEET

December 31, 1965 and September 30, 1966

LIABILITIES

	December 31, 1965	September 30, 1966 (Unaudited)
Current Liabilities:		
Accounts payable and accrued expenses	$ 1,029,473	$ 781,012
Accrued salaries and wages, etc.	487,698	483,397
Federal income taxes	554,225	805,990
Dividend payable	—	303,264
Total current liabilities	2,071,396	2,373,663
Stockholders' Equity:		
Common stock—authorized, 750,000 shares of $5 par value each; issued, 677,920 shares (including 306,000 shares at previous aggregate stated value of $4,657,318)	6,516,918	6,516,918
Capital surplus	1,359,691	1,359,691
Earned surplus	21,619,625	22,900,555
	29,496,234	30,777,164
Deduct—cost of 4,000 common shares held in treasury	94,225	94,225
	29,402,009	30,682,939
Total	$31,473,405	$33,056,602

Notes:

1. Investments: Included in investments is the cost, $750,000, of the Company's investment in capital stocks of affiliates engaged in barge operations. The Company's equity in the combined net assets of these affiliates exceeds its investments therein. These barge affiliates had loans of $2,043,405 at December 31, 1965, and $2,360,886 at September 30, 1966, and the owners of these affiliates in effect guarantee that the revenues will be sufficient to repay the installments of these loans. In connection with such guarantee, the Company has also agreed to maintain working capital of $1,750,000.

2. Commitments: At December 31, 1965, the Company had commitments of approximately $1,300,000 for advance royalty payments on long-term coal leases and $600,000 for future payments on option contracts to purchase coal lands, of which approximately $630,000 is payable in the year ending December 31, 1966. At September 30, 1966, such commitments amounted to approximately $1,050,000 for advance royalty payments and $600,000 for future payments on contracts to purchase coal lands.

ON AND EDUCATION
CAL SURVEY
PING
MINES
NOIS
MON
HE STATE OF ILLINOIS
ON WITH
S INSTITUTE, INC.
JO DAVIESS
STEPHENSON
WINNEBAGO
BOONE
MCHENRY
LAKE
CARROLL
OGLE
DEKALB
KANE
DUPAGE
CHICAGO
WHITESIDE
LEE
WILL COUNTY (ROMEO) STATION
SOUTH CHICAGO
ROCK ISLAND
MOLINE
JOLIET
PLAINES STATION
ROCK
HENRY
BUREAU
LASALLE
WILL
GRUNDY
HERO
HENNEPIN
OTTAWA
NEW WINDSOR
PUTNAM
NORTHERN ILLINOIS
KANKAKEE
MARK
MARSHALL
LAFAYETTE
SHERWOOD
KNOX
PEORIA
WOODFORD
LIVINGSTON
IROQUOIS
FULTON-PEORIA
NORTH PEORIA
KINGSTON
MCDONOUGH
TAZEWELL
LIVERPOOL
MCLEAN
FORD
HAVANA
MASON
DEWITT
VERMILION
CHAMPAIGN
DANVILLE
MENARD
LOGAN
BROWN
CASS
PIATT
MACON
MURDOCK
SANGAMON
MORGAN
SCOTT
MOULTRIE
EDGAR
CHRISTIAN
COLES
GREENE
SHELBY
SPRINGFIELD (CENTRAL)
CUMBERLAND
CLARK
MACOUPIN
MONTGOMERY
JERSEY
FAYETTE
EFFINGHAM
JASPER
CRAWFORD
ALTON
BOND
CLAY
RICHLAND
LAWRENCE
MADISON
EAST ST. LOUIS

FULTON-PEORIA
SPRINGFIELD (CENTRAL)
DANVILLE
MURDOCK
BELLEVILLE
EAST ST. LOUIS
ALTON
DUQUOIN
SOUTHERN ILLINOIS
SHAWNEETOWN
CAVE IN ROCK
JOPPA
PEORIA
WOODFORD
LIVINGSTON
MC DONOUGH
FORD
MASON
TAZEWELL
MC LEAN
DE WITT
VERMILION
CHAMPAIGN
PIATT
MACON
MORGAN
SCOTT
MENARD
SANGAMON
CHRISTIAN
MOULTRIE
DOUGLAS
EDGAR
COLES
GREENE
MACOUPIN
MONTGOMERY
SHELBY
CUMBERLAND
CLARK
JERSEY
FAYETTE
EFFINGHAM
JASPER
CRAWFORD
MADISON
BOND
CLAY
RICHLAND
LAWRENCE
CLINTON
MARION
WASHINGTON
WAYNE
JEFFERSON
PERRY
RANDOLPH
FRANKLIN
HAMILTON
WHITE
JACKSON
SALINE
GALLATIN
HARDIN
UNION
ALEXANDER
PULASKI
MASSAC

SPRINGFIELD (CENTRAL)
FULTON-PEORIA
BUSHNELL
BELLEVILLE
EAST ST. LOUIS
MURDOCK
Freight rate district
Boundary of the Pennsylvania System
Mine water contamination
Multiple mine depths or bedding partings
Shaft mine
Slope mine
Strip mine
Mine number
Production of 100,000 to 1 million tons in 1965
Production of 1 million tons or more in 1965

STATE GEOLOGICAL SURVEY
SHIPPING COAL MINES IN ILLINOIS
JACK A. SIMON
JANUARY 1, 1966
NEW WINDSOR
LAFAYETTE
SHERWOOD
FULTON-PEORIA
SPRINGFIELD (CENTRAL)
NORTHERN ILLINOIS
MURDOCK
EAST ST. LOUIS

NUG. DEP. EXHIBIT 39-A

bcc: Mr. J. M. Morris (1)

December 11, 1964

Mr. Frank Nugent, President
Freeman Coal Mining Corporation
300 W. Washington St.
Chicago, Illinois 60606

Dear Frank:

Enclosed please find four copies of the tabulation you requested of the Midwestern coal consumption by utility plants for the year 1963.

We trust that this is the information you wanted and if there is anything further we can do in this connection, please advise.

Best regards,

/s/ T. J. Tarzy
T. J. TARZY

TJT:sjs

cc: Mr. B. R. Gebhart

* Denotes use of additional coal from s ces other than Illinois, Indiana, & West Kentucky.

All tonnage figures shown are in thousands.

MIDWESTERN COA CONSUMPTION BY UTILITY PLANTS 1963

(Plants using under 50,000 tons per year not included)

GOVERNMENT EXHIBIT Nug. Dep. 39-B

Total Tons All MIDWESTERN Coal	Name of Utility	Tons of ILLINOIS Coal Used	Tons of INDIANA Coal Used	Tons of WEST KENTUCKY Coa Used
15,870*	TVA	3,470	-	12,420
11,350	Commonwealth Edison	10,450	700	200
4,390	Union Electric	4,390	-	-
4,060	Indiana & Kentucky Electric Corp	-	1,680	2,380
3,320	Public Service of Indiana	-	1,560	1,760
3,150	Electric Energy	1,400	-	1,750
2,660*	Wisconsin Electric Power	1,400	-	1,260
2,230	Illinois Power	2,000	30	200
2,170*	Indiana & Michigan Electric	-	1,570	600
2,110*	Northern States Power	1,910	-	200
1,600	Central Illinois Public Service	1,600	-	-
1,580	Northern Indiana Public Service	200	1,380	-
1,560	Indianapolis Power & Light	-	1,560	-
1,460*	Cincinnati Gas & Electric	-	-	1,460
1,410	Louisville Gas & Electric	-	-	1,410
1,290*	Consumers Power	80	80	1,130
1,160	Memphis Tenn. Light, Gas & Water	-	-	1,160
980	Central Illinois Light	980	-	-
980	Wisconsin Power & Light	620	-	360
900*	Tampa Electric - F. J. Gannon	-	-	900
550*	Kentucky Utilities	-	-	550
480	Dairyland Power Co-Op.	420	-	60
470	Interstate Power	460	10	-
450	Southern Indiana Gas & Electric	-	430	20
410*	Wisconsin Public Service	410	-	-
400*	Iowa Electric Light & Power	400	-	-
400*	Georgia Power	-	-	400
300	Iowa-Illinois Gas & Electric	300	-	-
280	Central Electric Power-Chamois	280	-	-
230	Springfield Ill. Water Light & Power	230	-	-
190	Central Illinois Electric & Gas	140	50	-
160	Madison Gas & Electric	120	-	40
130	Richmond Indiana Electric & Power	-	130	-
120	Lake Superior District Power-Ashland	120	-	-
100	[illegible]	[illegible]	[illegible]	100

2,230	Illinois Power	2,000	30	200	
2,170*	Indiana & Michigan Electric	-	1,570	600	
2,110*	Northern States Power	1,910	-	200	
1,600	Central Illinois Public Service	1,600	-	-	
1,580	Northern Indiana Public Service	200	1,380	-	
1,560	Indianapolis Power & Light	-	1,560	-	
1,460*	Cincinnati Gas & Electric	-	-	1,460	
1,410	Louisville Gas & Electric	-	-	1,410	
1,290*	Consumers Power	80	80	1,130	
1,160	Memphis Tenn. Light, Gas & Water	-	-	1,160	
980	Central Illinois Light	980	-	-	
980	Wisconsin Power & Light	620	-	360	
900*	Tampa Electric - F. J. Gannon	-	-	900	
550*	Kentucky Utilities	-	-	550	
480	Dairyland Power Co-Op.	420	-	60	
470	Interstate Power	460	10	-	
450	Southern Indiana Gas & Electric	-	430	20	
410*	Wisconsin Public Service	410	-	-	
400*	Iowa Electric Light & Power	400	-	-	
400*	Georgia Power	-	-	400	
300	Iowa-Illinois Gas & Electric	300	-	-	
280	Central Electric Power-Chamois	280	-	-	
230	Springfield Ill. Water Light & Power	230	-	-	
190	Central Illinois Electric & Gas	140	50	-	
160	Madison Gas & Electric	120	-	40	
130	Richmond Indiana Electric & Power	-	130	-	
120	Lake Superior District Power-Ashland	120	-	-	
100	Owensboro, Ky. Municipal Utility	-	-	100	
80	Manitowoc Wisc. Public Utility	80	-	-	
80	Muscatine Iowa Munic. Elec. Plant	70	-	-	
70	N. E. Missouri Electric Power	70	-	-	
60	Marshfield Wisc. Elec. & Water	60	-	-	
60	Crawfordsville Ind. Elec. Light & Pr.	-	60	-	
50*	Iowa Public Service	50	-	-	
50	Mt. Carmel Public Utility	-	50	-	
50	Logansport, Indiana, City of	-	-	50	
69,400	TOTALS	31,690	9,290	28,420	
	Total Field Production	51,700	15,100	35,700	102,500
	Tons Used by Utilities	31,690	9,290	28,420	49.40
	Percentage Utility Use	61.3%	61.5%	79.6%	

NUG. DEP. EXHIBIT 49

BOARD OF DIRECTORS MEETING HELD OCTOBER 28, 1960

* * * *

Upon motion duly made by Mr. Nugent, and duly seconded by Mr. Falkoff, it was unanimously

RESOLVED, that the proper officers of this Company, for and on its behalf, be and they hereby are authorized and directed to place a purchase order for a 70 cubic yard stripping shovel costing approximately $2,800,000.00; and

FURTHER RESOLVED, that said order be subject to cancellation within 30 days from this date by payment of such expenditures as the manufacturer may have made during that time and which cannot be recouped by him.

The Chairman stated because of conversations in the past in regard to possible consolidation with another coal company in this area it might be well to give some consideration to the subject.

Thereupon, on motion duly made by Mr. Gebhart, and duly seconded by Mr. Thorson, Messrs. Nugent, Falkoff and Morris not voting, it was

RESOLVED, that a committee composed of Messrs. Nugent as Chairman, Falkoff and Morris be and they hereby are appointed to serve at the pleasure of this Board to investigate and report to this Board concerning such consolidation.

* * * *

NUGENT EXHIBIT A

THE UNITED ELECTRIC COAL COMPANIES
307 North Michigan Avenue
Chicago 1, Illinois
FRANK F. KOLE
PRESIDENT

October 9, 1956

Mr. Henry Crown
Chairman of the Board
Material Service Corporation
300 West Washington Street
Chicago 6, Illinois

Dear Henry:

Herewith a comparison of ourselves and Traux-Traer based primarily on tons produced in each locality per annum showing what we would get in a merger and what we might be giving. The earnings by United and Truax per ton from the coal in each area should be the same over a period of time, as the overburden in each area is about the same on the average. Some years overburden will be much lower at one mine than another, resulting in lower stripping cost and lower blasting cost, but it will average out.

At present in Fulton County we are producing the same tons as Truax, but our potential reserves are 60 per cent greater, and ultimately this will be represented in production and sales. We are now building a new, larger wheel at our Cuba mine which will increase our capacity there 500,000 tons a year, and we are also considering the acquisition of a mine in the Banner area on the Illinois River just below Peoria. This mine is now producing 200,000 tons a year, and we might increase this to 700,000 tons. If we did this, our total capacity in Fulton County would be 3,300,000 tons, as compared with Truax's present 2,100,000. In Southern Illinois

Truax has much larger reserves than we do, but I do not think this is a particularly good place to have reserves. Our Danville and Buffalo Creek mines are very profitable mines, as profitable as or more profitable than similar mines in Fulton County. The Truax mines in West Virginia and in North Dakota are out of our territory, and I do not know anything about them.

More of the benefits would come from the Truax properties than from our own. At present the tonnage from the Little Sister properties goes to the Little Sister washer and then goes by Burlington Railroad to the Truax dock. We would take this to Buckheart and then down our railroad. At the Shakerag mine of Truax, the combined company might save money by putting in a washer to prepare only two sizes of coal, 2 x 4 and 2 x 0. The various other sizes could be produced at the Fidelity washer. This would make for a cheap and economical-to-run washer at the Shakerag properties.

For a consolidated company, the West Virginia tonnage does not have as much purpose as in the present Truax company, as in a consolidated company it would be only a fifth of the total output, instead of a third, and if certain expansion that we are contemplating were put through, it would be only a sixth. Under these circumstances, it would be only the tail of the dog, with its own mining and selling problems that would be completely different from the problems of the other 80 per cent. I doubt whether under these circumstances it would get the same progressive, forward-looking attention that the other 80 per cent would, and whatever it did get might detract from the attention that should be given to the properties in the Middle West. With the present move toward consolidations in the East and toward acquisition of properties, it might be that this property could be sold and the funds distributed to the present Truax stockholders, or they might be given preferred stock.

If the Eastern properties were taken out, our relative productions would be as follows:

	United's Production	Truax's Production	Excess of Truax's Production Over United's
Fulton County	2,100,000	2,100,000	—
Railroad—Profits in Tons of Coal Equivalent	300,000	—	(300,000)
Danville	300,000	—	(300,000)
Buffalo Creek	300,000	—	(300,000)
Total	3,000,000	2,100,000	(900,000)
Southern Illinois	1,500,000	2,500,000	1,000,000
Total	4,500,000	4,600,000	100,000
North Dakota	—	1,500,000	1,500,000
Total	4,500,000	6,100,000	1,600,000

The earnings from the 6,100,000 would not be far different from the earnings from the 4,500,000.

We are in a position now to go ahead with some expansion, and if we did so, we would be sharing the benefits of this with Truax. On the other hand, they would be paying their share of it. We have the possibility now of earning $3.50 or $4.00 a share from our present properties and of opening new mines which would increase these earnings. I just want to be sure that in a merger our earnings per share per annum would be increased.

Very sincerely yours,

/s/ Frank F. Kolbe
FRANK F. KOLBE
President

GOVERNMENT EXHIBIT Fed. Dep. 5

The United Electric Coal Companies
Computation of Provision for Federal Income Taxes
Month of October, 1966 and 10 Months ended October 31, 1966

Profit before Income Taxes (Year to Date)			4,144,190
Less:			
Excess of percentage depletion over depletion recorded per books			1,813,978
Taxable Income (Year to Date)			2,330,212
Income Tax Calculation	2,700,571 @ 48%	1,296,274	
	29,641 @ 25%	7,410	
		1,303,684	
Surtax Credit		(6,500)	1,297,184
Investment Credit			(13,420)
			1,283,764
Additional provision			21,236
Provision for Income Taxes (Year to Date)			1,305,000
Less to Date Tax Provision (Last Month)			1,100,000
Provision for Income Taxes (This Month)			205,000

The United Electric Coal Companies

INTERCOMPANY SALES	OCTOBER 1964	YEAR TO DATE OCTOBER 31, 1964
FREEMAN	$ 142,196.27	$ 1,794,362.93
MATERIAL SERVICE	41,366.10	276,264.00
	$ 183,562.37	$ 2,071,626.93

THE UNITED ELECTRIC COAL COMPANIES
ACTUAL VS. BUDGET
YEAR TO DATE OCTOBER 31, 1966

	Actual	% of Sales	Budget	% of Sales
Net Sales	19,622,000	100.0	17,671,000	100.0
Operating Profit	4,028,000	20.5	2,905,000	16.4
Other Income (Expense)	116,000	.6	100,000	.6
Provision for Contingency	-	-	300,500	1.7
Profit before Income Taxes	4,144,000	21.1	2,704,500	15.3
Net Income	2,839,000	14.5	1,966,500	11.1

SALES

Sales were up because of more business and higher realization than anticipated in the budget.

PROFIT

Profit was greater because of higher sales as per above, and costs incurred have generally been lower than anticipated.

Included in net income is $13,420.06 of investment credit.

BALANCE SHEET

The Company had commitments of approximately $2,500,000 for payments of advance royalties and on option contracts to purchase coal lands.

Barge affiliates of the Company had loans of $2,568,606 as of September 30, 1966, and the owners of those affiliates in effect guarantee that the revenues will be sufficient to repay the installments of these loans.

As of October 31, 1966, the Company had a reserve for doubtful accounts of $50,000.

Included in cash as of October 31, 1966, are $5,475,000 of Certificates of Deposit.

Included in intercompany receivables are promissory notes in the amount of $2,000,000 from General Dynamics Corporation and accrued interest thereon of $6,333.

THE UNITED ELECTRIC COAL COMPANIES
ACTUAL VS. BUDGET
OCTOBER, 1966

	Actual	% of Sales	Budget	% of Sales
Net Sales	2,042,000	100.0	1,905,000	100.0
Operating Profit	510,000	25.0	340,000	17.8
Other Income (Expense)	40,000	1.9	10,000	.5
Provision for Contingency	-	-	35,000	1.8
Profit before Income Taxes	550,000	26.9	315,000	16.5
Net Income	345,000	16.9	229,500	12.0

SALES

PROFIT

The increase in net income resulted primarily from higher realization and lower costs than anticipated at Fidelity and Banner mines.

BALANCE SHEET

THE UNITED ELECTRIC COAL COMPANIES
CASH FORECAST
NOVEMBER, 1966

Balance October 31, 1966	7,264,333
November, 1966 Surplus (deficit)	(6,200,000)
Balance November 30, 1966	1,064,333
December, 1966 Surplus (deficit)	400,000
Balance December 31, 1966	1,464,333
January, 1967 Surplus (deficit)	300,000
Balance January 31, 1967	1,764,333
February, 1967 Surplus (deficit)	350,000
Balance February 28, 1967	2,114,333
March, 1967 Surplus (deficit)	400,000
Balance March 31, 1967	2,514,333
3 months ended June 30, 1967 Surplus (deficit)	900,000
Balance June 30, 1967	3,414,333
3 months ended September 30, 1967 Surplus (deficit)	900,000
Balance September 30, 1967	4,314,333

THE UNITED ELECTRIC COAL COMPANIES
MONTHLY ESTIMATE OF SALES AND PROFIT
AS OF NOVEMBER 15, 1966

	As of November 15, 1966			
	Actual	Estimated		
	10 Months Ended Oct. 31	November	December	Year Ended December 3
Sales	19,622,320	2,000,000	1,877,680	23,500,000
Pretax Profit	4,144,190	300,000	305,810	4,750,000
Tax Provision (before investment credit)	1,318,420	70,000	75,000	1,463,420
Investment Credit	13,420			13,420
Net Income	2,839,190	230,000	230,810	3,300,000

1806-b

INCOME STATEMENT

The United Electric Coal Companies

DATE October, 1966

LINE		CURRENT			YEAR TO DATE		
1	ITEMS						
2	NET SALES						
	COST OF SALES	2	047	860	19	622	320
		1	531	308	15	994	535
	OPERATING PROFIT (LOSS)		510	352	4	027	785
6	OTHER INCOME (EXPENSE)						
7	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES						
8	INTEREST INCOME		27	377		215	262
9	INTEREST EXPENSE						
10	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		5	000		6	333
11	MISCELLANEOUS NET		6	975		(105	190)
12							
13	PRETAX PROFIT (LOSS)		550	208	4	144	190
14	PROVISION FOR INCOME TAXES		205	000	1	305	000
15	NET INCOME (LOSS)		345	208	2	839	190
16							
17	SALES - INTERCOMPANY (MS and its subsidiaries)		183	562	2	071	827
18	- INTERDIVISION						
19							
20	INVESTMENT CREDIT		-			13	820
21							
22							
23							
24	YEAR TO DATE						
25	NET SALES						
26	COST OF SALES	19	622	320	19	622	320
27		15	994	535	15	994	535
28	OPERATING PROFIT (LOSS)	4	027	785	4	027	785
	OTHER INCOME (EXPENSE)						
29	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES						
30	INTEREST INCOME		215	262		215	262
31	INTEREST EXPENSE						
32	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		6	333		6	333
33	MISCELLANEOUS NET		(105	190)		(105	190)
34							
35	PRETAX PROFIT (LOSS)	4	144	190	4	144	190
36	PROVISION FOR INCOME TAXES	1	305	000	1	305	000
37	NET INCOME (LOSS)	2	839	190	2	839	190
38							
39	SALES - INTERCOMPANY (MS and its subsidiaries)	2	071	827	2	071	827
40	- INTERDIVISION						
41							
42	INVESTMENT CREDIT		13	820		13	820
43							
44	SALES - RENEGOTIABLE						
45	- NONRENEGOTIABLE	19	622	320	19	622	320
46	TOTAL (LINE 25)	19	622	320	19	622	320
47							
48	STATISTICAL DATA						
49	NET SALES (LINE 25)	19	622	320	19	622	320
50	LESS: SUPPORT DIVISIONS SALES						
51	DIVISION SALES BASE	19	622	320	19	622	320
52							
53	DEPRECIATION, AMORTIZATION, ETC.	2	939	035	2	939	035
54	DEPLETION IN EXCESS OF COST	1	813	978	1	813	978
55	DIVIDENDS RECEIVED - FROM SUBSIDIARIES						
56	- OTHERS			50			50
57							
58							
59							

FROM The United Electric Coal Companies

GENERAL DYNAMICS CORPORATION

BALANCE SHEET

The [illegible] Electric Light Companies

October 31, 1966

LINE	CLASSIFICATION	AMOUNT		
	CASH	7	204	333
	MARKETABLE SECURITIES			
	RECEIVABLES - GOVERNMENT			
4	- TRADE (LESS RESERVES)	2	406	992
5	UNREIMBURSED EXPENDITURES			
6	INVENTORIES	2	272	696
7	LESS: ADVANCE AND PROGRESS PAYMENTS			
8	NET INVENTORIES	2	272	696
9	PREPAID EXPENSES		271	349
10	INTERCOMPANY RECEIVABLES	2	115	236
11				
12				
13	TOTAL CURRENT ASSETS	14	331	103
14				
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES			
16	EQUITY, IN EXCESS OF COST - UNCONSOL SUBSIDIARIES			
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS		753	885
18				
19	PROPERTY, PLANT AND EQUIPMENT - GROSS	53	988	443
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	34	003	874
21	PROPERTY, PLANT AND EQUIPMENT - NET	18	639	569
22				
23	TOTAL ASSETS	33	724	557
24				
25	NOTES PAYABLE TO U.S. BANKS			
26	NOTES PAYABLE TO CANADIAN BANKS			
	CURRENT INSTALLMENTS ON LONG-TERM DEBT			
	ACCOUNTS PAYABLE AND ACCRUED EXPENSES		856	345
29	ACCRUED SALARIES AND WAGES		525	810
30	U.S. AND CANADIAN INCOME TAXES	1	010	989
31	CUSTOMERS' DEPOSITS			
32	DIVIDENDS PAYABLE		303	264
33	INTERCOMPANY PAYABLES			
34				
35				
36	TOTAL CURRENT LIABILITIES	2	696	414
37				
38	LONG-TERM DEBT (LESS CURRENT PORTION)			
39	DEFERRED INCOME TAX			
40	MINORITY INTERESTS			
41				
42	INTERDIVISION ACCOUNTS			
43				
44	UNREALIZED PROFIT - INTERCOMPANY			
45	- INTERDIVISION			
46				
47	SHARE OWNER'S EQUITY			
48	CAPITAL STOCK	6	516	918
49	TREASURY STOCK		91	225
50	CAPITAL SURPLUS	1	357	691
51				
52	EARNED SURPLUS, BEGINNING OF YEAR	21	613	825
	NET INCOME (LOSS)	2	859	190
	DIVIDENDS - CAPITAL STOCK	1	213	056
55				
56				
57				
58	EARNED SURPLUS, END OF PERIOD	23	245	759
59	TOTAL SHARE OWNERS' EQUITY	31	028	143
60	TOTAL LIABILITIES AND EQUITY	33	724	557

The United [illegible]

GOVERNMENT EXHIBIT
Beg. Dep.
1

KEYSTONE STEEL & WIRE COMPANY

PEORIA • ILLINOIS • 61607

R. A. REDARD
VICE PRESIDENT, PURCHASING

G. P. BOWEN
PURCHASING AGENT

April 26, 1968

Department of Justice
United States Courthouse
Room 2634
Chicago, Illinois 60604

Gentlemen:

Re: United States v. General Dynamics Corporation et al., Civil Action No. 67 C 1632 (N. D. Ill.)

In response to your letter of April 15, we have accumulated the following data for you. Annual coal purchases in each of the years 1964 through 1967 in total tons and dollar value are as follows:

	Truax-Traer	United Electric	Republic	Peabody
1964				
Tonnage	80901	47529	23081	6972
$ Value	$353,993.72	$201,638.35	$132,801.62	$31,219.16
1965				
Tonnage	81337	46512	29430	6885
$ Value	362,567.90	207,523.61	134,250.11	30,972.57
1966				
Tonnage	76316	44371	20703	7534
$ Value	343,079.74	204,316.73	199,816.60	40,144.04
1967				
Tonnage	79392	52169	28396	13338
$ Value	349,105.92	245,725.43	130,490.98	58,007.23

Some of the above suppliers maintain more than one mine, and their billing does not reflect from which of these mines the shipment originated. All of the mines supplying our plant are located within a 25 mile radius of

scheduled
5-22-68

DEPARTMENT OF JUSTICE
MAY 2 1968
CIVIL DIVISION

Peoria. The type of coal we use, namely No. 5 and No. 6 Seam, precludes shipment from any other area.

Coal is purchased by our Peoria facility as a fuel to generate steam for our Power Plant. We purchase stoker screening type coal; it is used by equipment described as follows: 1 Erie City boiler with a Detroit stoker; 3 Combustion Engineering with Combustion stokers. Three stokers are overthrow spreader type and one is an underthrow spreader design. We are equipped to burn gas or oil, however coal is used as a more efficient, economical, fuel.

Our Peoria plant does not consume any other energy fuel for the same purpose for which coal is required.

We do consume other types of energy fuel such as gas and fuel oil for our Open Hearth furnaces, for many reheating furnaces, and for heat treating devices throughout our plant. Coal could not be used as a substitute for any of these purposes. A 60% - 40% gas-oil mixture is used in our Open Hearth furnaces. This mixture produces the most efficient, desirable flame for melt-down purposes. In all other locations we consume gas; it is the most efficient fuel available in each instance. We are equipped to substitute oil in each of these locations during the winter months when the local utility interrupts our service because of severe weather conditions.

We have no charts, surveys, or memoranda to substantiate the above information; however, any of the facts stated above may be verified by our technicians or by a visit to our plant. We have indicated our reasons for not converting to other fuel sources.

We hope this information will materially assist you.

Very truly yours,

R. A. Redard

R. A. REDARD
VICE PRESIDENT, PURCHASING

RAR:jmh

Simon Dep. Ex. 1, 7-21-69 FA

Reprinted from Proceedings of the Illinois Mining Institute, 76th year, p. 57-68, 1968.

GOVERNMENT EXHIBIT Sim. Dep. 1

AN EVALUATION OF ILLINOIS COAL RESERVE ESTIMATES

J. A. SIMON, *Principal Geologist* and W. H. SMITH, *Geologist*
Illinois State Geological Survey
Urbana, Illinois 61801

INTRODUCTION

Illinois has the largest total bituminous coal reserves and the largest strippable bituminous coal reserves of any state in the Union (figs. 1 and 2). A large percentage of these reserves are characterized as relatively thick and flat-lying coal seams. The coal-bearing sequence of rocks underlies about two-thirds (36,806 square miles) of the state and includes more than 50 coal seams, about 20 of which have been commercially mined at least locally. Most production has come from six to eight coal seams, and 85 to 90 percent of the total production has come from the Herrin (No. 6) and Harrisburg-Springfield (No. 5) Coals.

This report has two primary purposes: (1) to review the status of coal reserve estimates for Illinois, including those for both total reserves and strippable reserves and (2) to offer some comments on the significance and meaning of coal reserve estimates.

It is not necessary here to define most of the terms that will be used in this report. A few, however,—coal resources, coal reserves, minable coal reserves, and strippable coal reserves—are frequently used interchangeably even though they are not synonymous, and their common usage and use in this report should be clearly understood.

Coal resources are all coal that occurs in the ground in any designated area without regard to thickness or minability. The only limitation is that the material being considered meets a suitable definition of coal. In this report, we are not concerned directly with coal resources except to note that coal resources in Illinois are much larger than coal reserves, as defined below, and that quantities of coal resources not now classified as reserves will be so classified in the future.

Coal reserves are that portion of coal resources, usually measured in tons, that are commonly limited by minimum thickness, often by maximum depth, and occasionally by other factors.

Minable coal reserves normally are coal reserves that can be re-

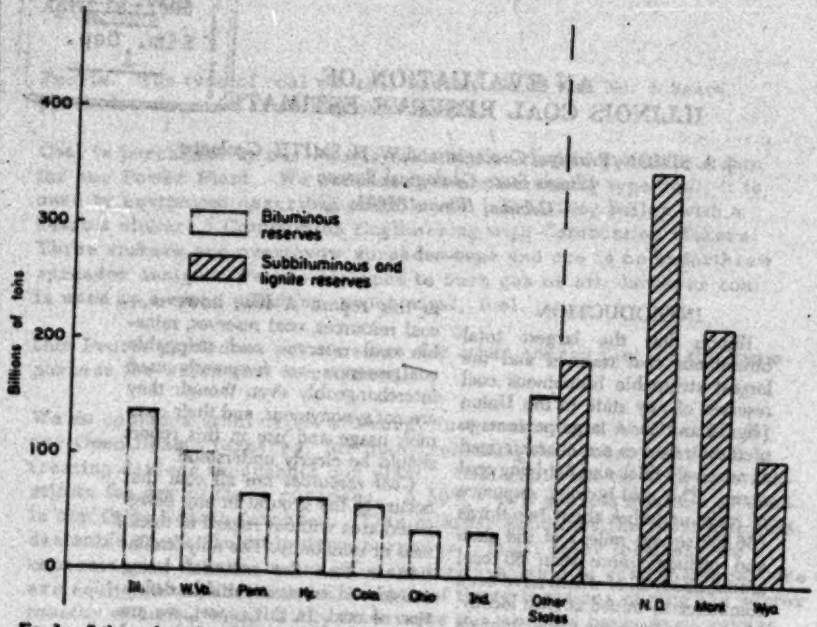


Fig. 1 — Estimated total remaining coal reserves of the United States, Jan. 1, 1967. Data from Paul Averitt, U. S. Geological Survey, personal communication, 1968.

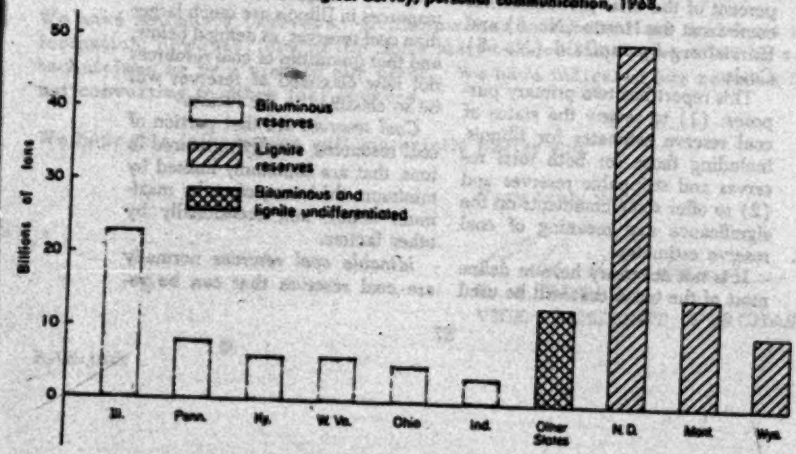


Fig. 2 — Estimated original reserves of strippable coal in the United States. Data from Averitt (1960, 1968).

covered by existing techniques, but most published studies have specifically considered neither technology nor the economics of mining, which are often merely implied in determining reserves. Generally, so-called minable coal reserves determinations have been based solely on presence of coal of a predetermined minimum or greater thickness and (in some cases) a maximum depth. Thus as generally reported, the terms *coal reserves* and *minable coal reserves* are synonymous, or nearly so. The desirability of distinguishing between *coal reserves* and technologically and economically *minable coal reserves* is obvious, but the fact that this differentiation has not generally been made in regional reserves studies should be well understood.

Strippable coal reserves carries the same implications of technologic and economic producibility as *minable coal reserves*, but in common practice they have been defined only by minimum thickness and either depth of overburden or stripping ratio for large areas ranging in size from counties up to a whole state.

Certain information is needed in studies of coal reserves of a large area. Some of the data are usually included in reserves studies, but other data are generally ignored. This report discusses both. The data usually given in reports include the following (as defined in each study):

a) Estimate of total coal in the ground by seam
b) Area where reserves were estimated
c) Degree of reliability of the estimates
d) Thickness categories for the estimates down to a minimum thickness considered
e) Thickness of overburden, or stripping ratio, for strip coal

Not included in most such studies are:

a) Quality (except broad rank categories)
b) Depth
c) Mining conditions
d) Economics
e) Land availability
f) Regulations and controls

COAL RESERVES OF ILLINOIS

The great need for coal reserves data in the United States was widely recognized after the turn of this century. In 1908, F. W. DeWolf, then Assistant State Geologist of Illinois, estimated about 137 billion tons of original coal reserves for Illinois.

Since that first state-wide summary of reserves, several additional authoritative estimates have been made (table 1). All but one exceeded DeWolf's estimate. The lowest estimate shown in table 1 included a number of factors not considered in any of the other estimates and generally excluded large areas where very little reliable data existed.

A series of detailed studies, including reserves estimates, was made for the various mining districts of the state by several authors

TABLE 1 – PRINCIPAL ESTIMATES OF ILLINOIS COAL RESERVES

Source	Date	Billions of tons in the ground	Minimum Thickness (in.)
DeWolf	1908	137.0	36
Campbell and Parker	1909	240.0	?
Bement	1910	201.5	12
Campbell	1913	201.5	14
Bement	1929	201.4	36
Averitt and Berryhill	1950	165.6	?
*Ford, Bacon, and Davis	1951	49.6	28 (underground) 12 (strippable)
Cady	1952	137.3	28
Simon and Smith	1968	140.0	28 (underground) 18 (strippable)

*Minability factors considered in addition to presence of coal.

between 1915 and 1925. These were published as a series of Cooperative Mining Investigations Bulletins (see Illinois Geological Survey List of Publications). G. H. Cady (1946), in an unpublished manuscript, tabulated the reserve estimates from these earlier studies, modified the totals where appropriate, and added additional information not included in the earlier studies. This compilation was the basis for the reserves data published by Averitt and Berryhill (1950).

In the early 1950's the Illinois State Geological Survey undertook another study of coal reserves of the state. This report (Cady et al., 1952) is the most comprehensive study yet made for Illinois. It utilized a very extensive file of drill hole logs and mine notes that the Survey had accumulated over a period of nearly 50 years. Cady's report has been the basis for most later coal reserves estimates for Illinois, such as that of Averitt (1960). It is interesting to note that the total remaining reserves in the 1952 study were nearly identical to the rough original reserves estimates DeWolf made many years earlier.

During the past 12 years, a series of detailed studies estimating strippable coal reserves (defined in the reports) has been made in Illinois. Most of the potential areas of strippable reserves in Illinois have now been studied. Seven parts of the nine-part series have been published (Smith 1957, 1958, 1961, 1968, Smith and Berggren, 1963, Reinertsen, 1964, Searight and Smith, in preparation). Two unmapped areas are currently being examined to complete the series.

Data collected in the strippable coal reserves studies and detailed reports on several counties published since the Cady report have resulted in modification of the esti-

mated remaining reserves. The remaining total coal reserves are estimated to be 140 billion tons (fig. 3). This amount, as defined in Cady's report and the strippable studies, was arrived at by reducing Cady's 1952 estimate by production since 1952 plus an equal amount of coal rendered unminable by such mining, and then adding reserves mapped in later studies. These reserves, classified by principal seam, are shown in figure 4.

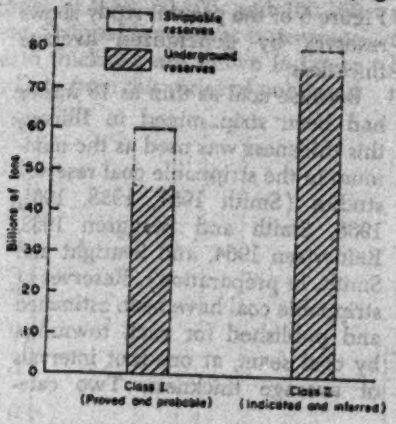


Fig. 3—Coal reserves of Illinois, 1968 (140 billion tons). Data from Cady et al. (1952), Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith in preparation).

We regard this estimate, *as it has been defined*, to be conservative. We are confident that continuing studies of Illinois coal resources will discover further reserves at a more rapid rate than the coal will be removed by mining or rendered unminable by mining for a number of years in the future. Large areas remain where coal-bearing strata are relatively untested, and there are areas where reserves data have been assembled on only the better

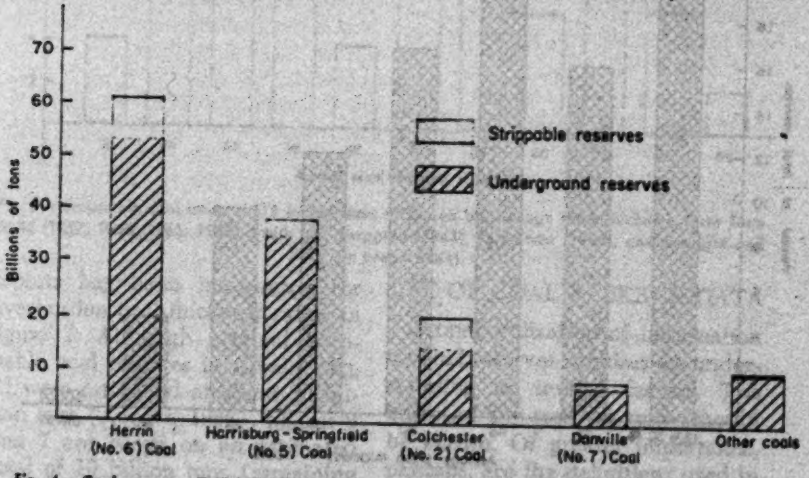


Fig. 4—Coal reserves (140 billion tons) of Illinois by coal seam. Data from Cady et al. (1952), Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).

known No. 6 and No. 5 Coals, although these are underlain by from several hundred to more than 1000 feet of coal-bearing strata in which coal thickness is not well known.

The Cady (1952) report on minable coal reserves of Illinois defined minable coal as being 28 inches or more thick. Most of the coal considered in the study was at depths of less than 1000 feet and none exceeded 1300 feet; no classification by depth was made.

Four classes of reliability, based on the quality of data used, were established and reserves computed for each coal seam at 1-foot intervals of avarage thickness. The published data were grouped by county, although calculations also had been made for each township. Figure 5 of the present study shows reserves by generalized average thickness.

Because coal as thin as 18 inches had been strip mined in Illinois, this thickness was used as the minimum in the strippable coal reserves studies (Smith 1957, 1958, 1961, 1968, Smith and Berggren 1963, Reinertsen 1964, and Searight and Smith, in preparation). Reserves of strippable coal have been estimated and published for each township, by coal seam, at one-foot intervals of average thickness. Two cate-

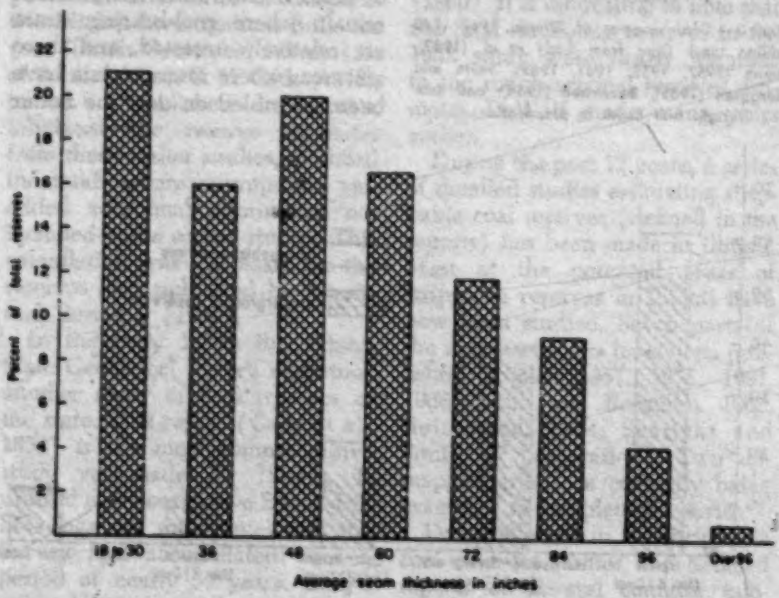


Fig. 5—Total coal reserves (140 billion tons) of Illinois by average seam thickness. Data from Cady et al. (1952), Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).

gories of reliability, based on the quality of the data, have been used. Overburden was divided into categories of 0-50, 50-100, and 100-150 feet. Strippable reserves by average seam thickness are shown in figure 6. Data from this series of published reports has been interpreted for overburden coal-thickness ratios in figure 7. Although original strippable coal reserves in Illinois (fig. 2) were estimated at about 23 billion tons (Averitt, 1968), figures 6 and 7 are based on an estimated total of 19 billion tons (remaining in the ground) only for the areas for which the reports on strippable coal reserves are completed. The original reserve figure cited by Averitt includes coal that has been mined and a preliminary estimate of reserves in the two areas yet to be mapped for the strippable coal reserves series.

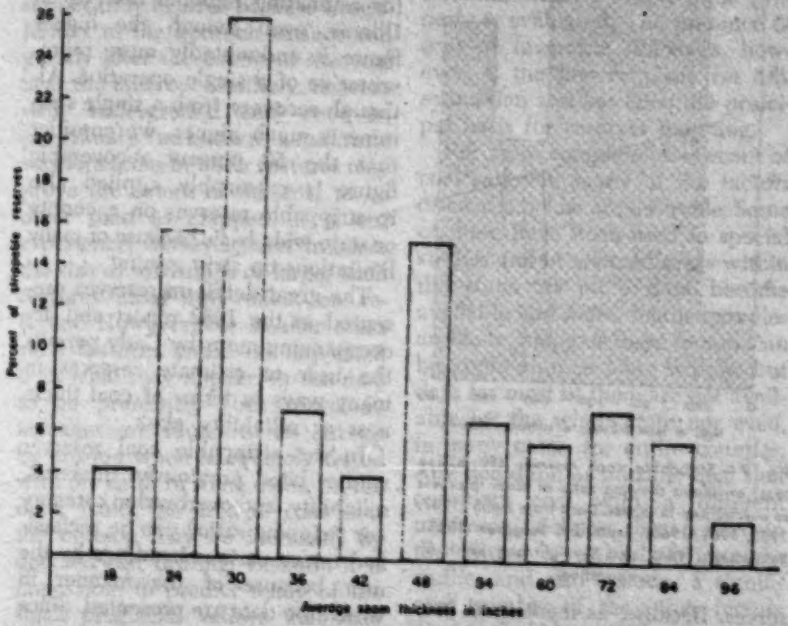


Fig. 6 — Strippable coal reserves (19 billion tons) of Illinois by average seam thickness. Data from Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).

USE OF COAL RESERVE DATA

Proper utilization of information on coal reserves requires an understanding of several factors. The object of any reserves study should be known. Of greater importance, perhaps, are the definitions used in each study, particularly terms such as "minable" or "strippable" re-

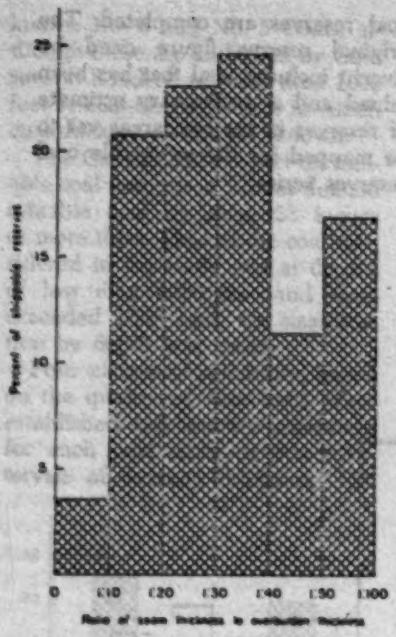


Fig. 7—Strippable coal reserves (19 billion tons) of Illinois showing ratio of seam thickness to overburden thickness. Data from Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Seeright and Smith (in preparation).

serves. Because, as mentioned previously, economics and technology are not fully considered in most studies of reserves, consideration of "minable reserves" must take this fact into account.

Distinction should be made between total coal in the ground and "recoverable" coal. Long-term general practice has indicated that 50 percent is a reasonable estimate of the amount of minable coal reserves recoverable. A recent study by Lawrie (1968) reported 57 percent of coal recoverable in modern underground mines. Considering losses of coal left between mines, surface culture that will not permit mining, and other factors making the coal unavailable, we regard 50 percent as a better recovery figure for estimating regional reserves in Illinois, even though the higher figure is undoubtedly more representative of a single operation. Although recovery from a single strip mine is much higher, we consider that the 50 percent recoverable figure is reasonably applied also to strippable reserves on a county or state-wide basis because of many limitations on strip mining.

The great detail on reserves presented in the 1952 report and accompanying maps by Cady permits the user to estimate reserves in many ways in terms of coal thickness or reliability class.

In the strippable coal reserves studies cited previously, thickness, reliability, and overburden category (or stripping ratio) can be reclassified under various headings by the user because of the manner in which the data are presented. Since thickness of reserves are generally reported at 6-inch to 1-foot intervals of average thickness, any minimum thickness greater than the 18-inch minimum used in these studies can be selected and any overburden limit can be assumed. Strip mine overburden limits are indicated on maps at 50, 100, and 150 feet, but estimates for intervening intervals can be made reasonably accurately.

The coal reserves data published

for Illinois has been misused in some cases. It is not always recognized that many areas of the state have been mapped from inadequate data. In such areas details on relatively small acreages, particularly in the case of strip coal, may be significantly in error because irregularities in the bedrock surface can greatly alter the extent of the coal near the outcrop. Similarly, in areas with underground coal reserves, previously unknown sandstone washout areas or other features may prove the extent of the coal to be other than as mapped. It is our experience, however, that in areas the size of townships or larger such features have little effect on reserves. However, for smaller areas such features could be important if in what may appear on the map to be promising (but untested) acreages are found to be cut up by erosion when adequately tested with the drill. In some cases, on the other hand, the area of coal near the outcrop may be increased by detailed test drilling. Because it is impossible to predict many of the small preglacial valleys that may reduce the coal mapped as available, we feel that there will generally be more reduction than increase of the shallow reserves with less than 50 feet of overburden. Again, however, we emphasize that this does not significantly reduce over-all reserves estimates as defined in recent studies published by the Geological Survey, even though tracts of up to several hundred acres may be found to be adversely affected when tested in detail.

OTHER FACTORS NEEDED FOR COAL RESERVES EVALUATION

Reserves estimates of coal in the ground in large areas have not included all of the data that are essential when a single mine property is evaluated. The presence of coal of favorable thickness, however, is the first requisite for any evaluation and has been the principal basis for reserves mapping.

For more complete assessment of coal reserves, many of the factors discussed below are desirable. Some of these have been used in special studies and in selected areas within the state. As more data become available and more detailed studies are done, many of these factors can be applied much more widely, but data for most of them are not available for the whole state nor even, in many cases, for entire counties. Any definition of minable coal that considers coal with a different minimum thickness than is used in the Survey's published reserves studies and also includes a significant number of the other factors discussed below will, of course, produce total reserve figures different from those reported in recent reserves studies. This, however, does not change the reserve figures *as defined* in these studies.

Within the limits of this paper, little more than a listing is practical to indicate the many other factors desirable for assessing coal reserves. Although such information is reliable now for only small areas, sufficient data may someday be

available to permit their use in state-wide evaluations.

Quality

Coal quality should be considered in evaluating reserves. Evaluation of quality may include rank, fixed carbon, volatile matter, heating value, moisture, ash, totals and varieties of sulfur, chloride-alkali content, petrographic composition, and coking characteristics. Rank, heating value, moisture, and chloride-alkali content show systematic variation so that at least some known reserves could be, or have been, mapped in terms of these factors.

Depth

Although sufficient data are available for mapping coal reserves by depth categories, this has not generally been done in Illinois, because most mapped reserves lie at depths of less than 1,000 feet and practically none of them are below about 1,300 feet. However, deeper coals are believed to occur, with thicknesses great enough to be considered reserves as defined in most previous studies, and a classification based on depth for coals (other than the strippable coal reserves that are now so classified) seem desirable. For Illinois, eventually a breakdown that would include coal reserves to a depth of 1,000 feet, 1,000 to 2,000 feet, and greater than 2,000 feet might be appropriate. It is unlikely that there is any coal deeper than 2,500 feet within the state.

Mining Conditions

The factors controlling mining conditions are perhaps the most significant determinant of the "minability" of coal reserves, but these are also among the most difficult to assess on a broad-area basis. They include the quality of the potential mine roof and floor strata, hardness of the coal, water conditions, mined-out areas in higher and/or lower coals, character of overburden, and a wide variety of geologic features that may profoundly affect mining, such as faults, cutouts, horsebacks, rolls, whitetop, and igneous intrusions. Only mined-out areas and many coal washout areas are sufficiently well known to have been used to modify reserves. Although the actual areas mined out have been excluded from recent estimates, no modification has been made for coals present above or below a mined-out area.

Economics

The economic effects of factors that influence the "minability" of coal are constantly changing. Among the more vital factors to be considered economically important are capital and mining costs, markets, and availability of transportation and its cost. Such factors not only vary with time, but for any given time may vary significantly in different parts of the state.

Land Availability

Although factors concerned with land availability are closely related to economic considerations, many

of their other aspects are important. They include the availability of a sufficiently large block of coal, land that can be acquired, exclusions resulting from towns, railroads, highways, and similar features, and oil field areas. Current reserves estimates have excluded all areas heavily drilled for oil and gas. It is quite probable that future technology may permit mining of such areas, which would then result in significant increase in reserves mapped to date.

Regulations and Controls

Evaluation of a potential mine site may involve several additional factors, most of which would be difficult to apply to an assessment of statewide coal reserves. They include controls on water supply, waste or refuse disposal, mining regulations, stream and air pollution, and reclamation requirements.

CONCLUSIONS

Published coal reserves data for broad areas may be a valuable guide in economic evaluation and planning. If used with full understanding of the premises on which the estimate is based, they can also be an aid to exploration. Total coal resources (all coal in the ground) in Illinois are considerably larger than estimates of reserves, and as more information becomes available, significant additional quantities of the coal resources of the state will be added to reserves, as reserves are defined in most existing reserves estimates. Although total coal reserve estimates of Illinois are considered to be conservative as defined in Survey studies to date, minable or strippable reserve estimates based on these data will be smaller if mining is restricted to thicker seams or the estimates are modified by definitions of economic minability. They would also be increased by including thinner seams.

There is not, and never has been on the national or state level, any intention to suggest that coal with a minimum thickness of 14, 18, 28, or more inches, is minable throughout the areas mapped, even though such thicknesses have been and are being mined in favorable situations. Data presented in recent studies for Illinois, however, provide the basis for estimates to be made within any of the defined thickness limits and for any defined overburden limits.

Illinois is in a most favorable position for a greatly expanded coal industry because of the quantity of its reserves, and its relatively thick and flat-lying seams. Other factors favorable for at least broad areas of the state that were mentioned but not discussed in detail in the report insure a bright future for the coal industry in Illinois. Much work remains to be done to assess minable coal reserves in terms of quality, mining conditions, economics, and other factors. Programs of the Illinois Geological Survey are being applied to fill this need where sufficient data are available.

SLO. DEP. EXHIBIT 1

bcc: Mr. J. M. Morris
Mr. R. J. Hepburn

January 21, 1963

Mr. Robert S. Overbeck, General Manager
Raw Materials Division
Aluminum Company of America
1501 Alcoa Building
Pittsburgh 19, Pennsylvania

Dear Mr. Overbeck:

Thank you for your letter of December 13, 1962 in which you answered the questions raised in my letter of November 29, 1962.

We appreciate the thoughtful consideration given to United Electric's position in respect to conducting the mining operation when Alcoa wishes to exploit the Beaucoup Field, as set out in paragraph (a) of your letter.

Also, we understand that should United Electric be confronted with a specific opportunity to furnish coal that could be supplied from Beaucoup Field, Alcoa is willing to consider seriously leasing part of Beaucoup Field to United for that purpose. This, as set out in paragraph (b) of your letter.

We agree with you that there were no commitments other than those spelled out in the written agreement and we accept your judgment as to the understanding stated in Paragraphs (a) and (b) in your letter.

In regard to the third point raised in my letter of November 29th our thought had been to explore the possibility of leasing from Alcoa the top tier of sections in Beaucoup Field, that is, from east to west Sections 14, 15, 16, 17, 18 and 13, and we appreciate your willingness to discuss the idea. As you probably know we have been leasing and optioning the coal immediately north of the sections listed above and now have some 23 million tons under control, a location we refer to as the Round Prairie Field.

Since my letter to you we have decided to expand our holdings in Round Prairie to a minable reserve rather than work out a leasing arrangement with Alcoa, in the meantime, however, trusting that leasing from Alcoa continues to be a possibility for future discussion.

Thanking you for your attention to these matters.

Sincerely,

Secretary

STEINER DEPOSITION EXHIBIT 1

August, 1969

VITA

Peter O. Steiner

Personal:

Born: July 9, 1922, New York City

Education:

Oberlin College—A.B. (Magna Cum Laude)		1943
Harvard University—M.A. Economics		1949
	Ph.D. Economics	1950

Employment:

1944-1946	USNR
1947-1949	Teaching Fellow in Economics, Harvard
1949-1957	Lecturer, Instructor, Assistant Professor, University of California, Berkeley
1957-1959	Associate Professor of Economics, University of Wisconsin
1959-1968	Professor of Economics, University of Wisconsin
1968-	Professor of Economics and Law, University of Michigan

Fellowships:

Social Science Research Council, Faculty Research Fellow, 1956-1959
Guggenheim Fellow, 1960-1961
Ford Faculty Research Fellow, 1965-1966

Ph.D. Thesis: *Workable Competition in Radio Broadcasting* (Harvard, 1949)

Publications:

Books:

Productivity (with William Goldner) (University of California, Berkeley, 1952).

An Introduction to the Analysis of Time Series (Rinehart & Co., New York, 1956).

The Economic Status of the Aged (with Robert Dorfman) (University of California Press, Berkeley, 1957).

Economics (with Richard G. Lipsey) (Harper and Row, 1966).

Economics (with Richard G. Lipsey) (Harper and Row, 1969—2nd edition).

On the Process of Planning (Center of Economic Planning and Research, 1968).

Books Contributed To:

The New Frontiers of Aging, ed. by Wilma Donahue and Clark Tibbits (University of Michigan Press, 1957); Chapter "Income and Employment: Basic Facts."

An Appraisal of the 1950 Census Income Data, Studies in Income and Wealth, v. 23 (NBER, Princeton University Press, 1958); *Comment:* pp. 347-350.

The Price Statistics of the Federal Government (National Bureau of Economic Research, No. 73, General Series, 1961); Staff Paper 6: Consumer Durables in an Index of Consumer Prices.

Water Resource Development, S. C. Smith and E. N. Castle, eds., (Iowa State Press, Ames, 1964) Chapter 4: "Choosing Among Alternative Public Investments," pp. 34-55.

Transportation Economics, John Meyer, ed., National Bureau of Economic Research (Columbia University Press, 1965), "Some Allocation Problems in Highway Finance: Discussion."

Water Research, Allen V. Kneese and S. C. Smith, eds., (Johns Hopkins, 1966), "The Role of Alternate Cost in Project Design and Selection," pp. 33-47.

Problems in Public Expenditure Analysis, Samuel B. Chase, ed., "The Value of Travel Time: Comments," (Brookings, 1968), pp. 119-123.

Economic Policy and the Regulation of Corporate Securities, Henry G. Manne, ed., (American Enterprise Institute, 1969) pp. 365-369.

Articles:

"The Productivity Ratio: Some Analytical Limitations on its Use" *Review of Economics and Statistics*, Vol. XXXII, No. 4, November, 1950, pp. 321-328.

"A Source of Bias in One of the Samples of the 1950 Census," *Journal of the American Statistical Association*, v. 46 (March, 1951) (pp. 110-113).

"Program Patterns and Preferences, and the Workability of Competition in Radio Broadcasting," *The Quarterly Journal of Economics*, v. LXVI (May, 1952) (pp. 194-223).

"Collective Bargaining and the Public Interest," *Labor Law Journal*, v. 4, No. 6, (June, 1953) (pp. 410-416).

"The Size, Nature, and Adequacy of the Resources of the Aged," *American Economic Review*, v. XLIV, No. 2, (May, 1954) (pp. 645-660).

"Economic and Regulatory Problems in the Broadcast Field: Discussion of Paper by H. H. Goldin," *Land Economics*, v. XXX, No. 3, (August, 1954) (pp. 233-236).

"Optional Advertising and Optional Quality" (with Robert Dorfman) *American Economic Review*, v. XLIV, No. 5 (December, 1954) (pp. 825-836).

"Labor Monopoly and All That: Discussion of Paper by E. S. Mason," *Proceedings of the Eighth Annual Meeting*, Industrial Relations Research Association, (1955) (pp. 209-212).

"Peak Loads and Efficient Pricing," *Quarterly Journal of Economics*, v. IXXI, (November, 1957) (pp. 585-610). (See also same *Journal*, August, 1958, for comments and reply.)

"Percentage Depletion and Resource Allocation," *Compendium of Papers on Broadening the Tax Base*, Committee on Ways and Means, (U. S. Government Printing Office, 1959).

"Choosing Among Alternative Public Investments in the Water Resource Field," *American Economic Review*, v. XLIX (December, 1959).

"Monopoly and Competition in Television: Some Policy Issues," *Manchester School of Economic and Social Studies*, Vol. xxix, No. 2, May, 1961.

"Basic Issues in the Federal Taxation of Minerals," *Colorado School of Mines Quarterly*, January, 1963.

"The Non-Neutrality of Corporate Income Taxation —With and Without Depletion," *National Tax Journal*, September, 1963. (See also, same *Journal* March, 1964 for discussion and rejoinder).

"Monopolistic Competition after Thirty Years," *American Economic Review*, May, 1964.

"The Role of Alternative Cost in Project Design and Selection," *Quarterly Journal of Economics*, v. LXXIX, August, 1965 (pp. 417-430).

"Economics of Broadcasting and Advertising": Discussion, *American Economic Review*, v. LVI, No. 2, May, 1966 (pp. 472-475).

"Daily Newspapers, Monopolistic Competition and Economies of Scale": Discussion, *American Economic Review*, v. LVII, No. 2, May, 1967 (pp. 559-60).

"Economic Prospects and Planning in Greece: An American's View," *Balkan Studies*, Vol. 8, No. 2, 1967, pp. 353-363.

"Markets and Industries," *International Encyclopedia of the Social Sciences*, 1968, Vol. 9, pp. 575-581.

"Law and Quantitative Multivariate Analysis: An Encounter," (co-author) *Michigan Law Review*, June, 1968, pp. 1641-1678.

"Efficiency of Education in Economics"—Discussion, *American Economic Review, May*, 1969, Vol. LIX, No. 2, (pp. 240-242).

"The Public Sector and the Public Interest," *The Analysis and Evaluation of Public Expenditures: The PPB System. A Compendium of Papers*, Joint Economic Committee PRINT, 91st Cong. 1st Session 1969, Vol. 1 (pp. 13-45).

Documents:

In the Matter of the Deintermixture of Madison, Wisconsin, (FCC Dockets 14239 and 14229), Comments of Peter O. Steiner, January, 1962.

The Classification of Budget Data: A Proposal, Bureau of the Budget, OBR 63-1 September, 1962.

Airborne Television: The MPATI Proposal (FCC Docket 14229) (with H. Barnett), April, 1964).

Book Reviews: various

STEINER DEPOSITION
EXHIBIT 2

U.S. v. General Dynamics, et al.

MEMORANDUM OF EXPECTED TESTIMONY
of
Peter O. Steiner
Professor of Economics and Law
University of Michigan

1. Coal mining today is in the midst of a period of change so rapid and so pervasive that it has required, and continues to require, major readjustments in the structure and patterns of coal production and distribution. This rapidly changing context compels a dynamic, rather than static, examination of the structure of coal mining and of the role and effectiveness of competition. To analyze or evaluate the structure and patterns of coal production and distribution out of this context of pervasive change in the conditions of both demand and supply invites the confusion of cause with effect, and overlooks the success of coal producers in providing the nation with the benefits of vigorous competition.

2. While coal mining has suffered many set-backs since its heyday of the 1920's, the changes since World War II have provided a major challenge. Importantly, the railroad market has totally disappeared, the space heating market has virtually disappeared and the industrial steam coal market has declined. Thus, increasingly, coal producers have had to look to the electric utilities as the major source of their demand, and to adapt themselves to new requirements in order to compete effectively.

The decline in the number of producing firms from 1957 to 1967 illustrates the working of economic evolution: viable organizations have survived and those that were not have disappeared. The period of rapid change and basic challange to individual coal producers, and coal mining as a whole, has not ended. The utilization of nuclear energy is playing a major role in the current expansion program of electric utilities, and can only increase in the decades ahead. The increasing concern with air pollution provides a related but further threat to coal producers. Meeting anti-pollution requirements is bound to adversely affect coal's ability to compete with other fuels. This will result from the increased costs of using lower sulphur coals or in providing effective anti-pollution devices for existing grades of coal.

3. Competition as a goal of public policy is designed to assure low prices, to assure prompt response by suppliers to changes in patterns of demand and to keep producers under continuous pressure to find new and better ways to satisfy consumers' wants. Lack of effective competition may frustrate each of these purposes and lead to higher prices, to unaggressive and unresponsive behavior and to a generally unprogressive industry. The appropriate test of the competitiveness of any industry is its performance in these respects. The record shows that coal production has adapted to the change in the pattern of demand thrust upon it, and has managed to

increase productivity enough so that despite rising unit labor costs, the delivered price of energy from coal has remained stable. That it has done so by major innovation in the production, preparation, loading and marketing of coal is testimony to the effectiveness of competition both among coal producers and between coal and other energy sources.

4. The data show that over this period the size of mines has increased, the size of coal companies has increased and the number of viable mining companies has decreased. These things are not, as the Government complains, the symptoms of a lessening of competition, but are instead adaptations by coal producers to changes imposed upon them by the changes in the demand for coal and competition in the energy market. The increasing predominance of the electrical utilities as purchasers of steam coal, the increase in the designed capacity of new electric generation units, and utilities' insistence on a large, reliable, and low price source of fuel over the 20 or 30 year life of a generating facility, lead inexorably to the emergence and survival of coal producers with large reserves, developing large mines which are devoted to serving a small number of customers on long term contracts. The pressure to achieve low transportation costs on a freight-intensive commodity has reinforced the need for the long term commitment that only a large company with substantial reserves can credibly contract to provide.

5. The progressive disappearance of the small producer reflects the disappearance of the railroad market and the decline of the space heating market, the retail market and spot coal purchases by utilities. The need to commit vast reserves of coal to each major contract has led to the disappearance of producers with small reserves as active competitors in the utility market and has led to the assembling of large blocks of coal reserves under single managements. Competition among coal producers is characteristically no longer the competition of salesmen for coal already produced, but is instead the competition for long term supply contracts. Typically, the opening of a mine is geared both to a given long term contract, a given plant location, and a previously negotiated freight rate. This gives a special quality to competition that manifestly is not of a kind in which a small producer or a producer without large reserves can effectively compete.

6. The competitive viability of a producing company in the utility market is today measured not by its current production, nor by its current profits or cash flow, but, instead, by its ability to compete in the market for new long term contracts. This requires availability of acceptable reserves and of low cost transportation, and sufficient credibility both to assure performance on a contract and to acquire the funds necessary for producing the coal. For the same

reasons, the comparative competitive strength among coal producers and their prospective market positions should be measured by the quantity, quality and location of their reserves, rather than by their current or past levels of production.

7. The growth of mine size and the share of production by large coal producers is a direct response to the intense competition for the utility business both between coal producers and among competing fuels. Substitutability between coal and some competing energy sources exists even with existing facilities. Many of these already have the capability for alternative fuel use, and others could readily acquire it. The fact that coal continues to supply so much of the energy requirements of the electrical utilities reflects the success of coal producers in delivering coal at a low cost per BTU. That it has done this, despite sharply rising costs, reflects the technological revolution that has led to enormous increases in productivity, and to the ability to negotiate bulk shipment and unit train freight rates. Both coal prices and coal rail rates have increased far less than other prices in the economy. But these innovations, which make competitive prices possible, have created the need for large scale production, and thus for large companies.

8. The longer run competition among fuels concerns the design and location of new facilities rather than the

utilization of existing facilities. The dramatic emergence of nuclear energy as a competitive force is shown in the record. Coal producers will in fact be under continuing pressure to reduce costs and keep prices low if they are to retain their last remaining large market for steam coal. Again, coal's relative disadvantage, vis-a-vis other fuels, with respect to air pollution regulations increases the pressure upon it. The large coal company has no easy life nor protected position.

9. Electric utilities typically regard fuel purchasing as a top executive responsibility and the buyers are characteristically sophisticated about the available alternatives. This is another source of pressure on coal producers to seek to minimize costs and to keep prices low. The large utilities purchase coal in quantities that give them substantial market power, preventing any excess of bargaining power on the part of the producers. Utilities have and use the ability to play coal producers against one another. Moreover, some utilities possess their own coal reserves which add to their bargaining strength. Finally, inter-fuel substitutability provides an additional bargaining advantage to utilities.

10. In the context of this litigation, anti-merger policy should seek to preserve a sufficient number of alternative sources of supply to customers to assure competitive

behavior. This requires that we identify the relevant customers and their sources of supply, and examine the roles of United Electric and Freeman therein. In my view, the only significant product market within which to evaluate the competitive effect of the UEC-Freeman case is the supply of energy for electricity generation. The broad geographic area in which the midwestern utilities purchase energy is in fact a series of different markets. Defining the precise boundaries within which a particular utility generating station can purchase fuel is a complex but manageable matter that depends on the transportation routes available, freight rates, and technical characteristics of the fuel. Not all coal producers in the State of Illinois can effectively bid on all coal contracts. While two mines producing coal will often have some area in which they may both ship at equal cost, each will have areas where it is in a position to exclude the other supplier.

11. In negotiating for new locations of electric generating stations there are often wide alternative sources of supply both among fuels, and among producers of a given fuel. Once a facility is located and its equipment designed to utilize particular fuels, the alternative sources of supply have been narrowed. But characteristically, most of its fuel requirements have already been assured by that time, through long term supply contracts with one, or at most a few, suppliers.

12. In my judgment, on the basis of the record to

date, the UEC-Freeman combination does not have the effect of reducing competition, nor would a divestiture increase competition, for several reasons. First, because of its lack of reserves of the necessary quantity, quality and location, UEC alone is no longer able to compete effectively for meaningful long term supply contracts. Its inability to acquire additional strip reserves and its lack of underground capability are well documented. Second, because a combined UEC-Freeman does not represent excessive market power. The combined operation faces vigorous competition from other large coal producers, it faces the ever present threat of displacement of coal by competing fuels and it faces large and sophisticated buyers across the bargaining table. Third, because of differences in the location of its mines, in the quality of its coals and in the nature of its transportation routes, Freeman and UEC have long been predominantly complementary rather than competitive producers. Many of the common customer shipments identified in the record reflect this complementarity. Where common customers have existed, there is in the main no shortage of bargaining power on the part of the purchasers such that they have been disadvantaged by the common ownership.

August 14, 1969

Source Material

1. Report of Paul Weir Co.
2. Report of Seversky Environmental Dynamics Research Associates.
3. Report of John E. Organ.
4. Statement of Expected Testimony of Bruce C. Netschert, and attachments thereto.
5. Statement of Expected Testimony of Abraham Gerber, and attachment thereto.
6. Department of Justice Statistical Exhibits.
7. Deposition Testimony.
8. Complaint.
9. Interrogatory Answers of the Parties.

TERLEKE DEPOSITION
EXHIBIT 2

MID-WEST COAL PRODUCERS INSTITUTE, INC.
307 North Michigan Avenue
Chicago 1, Illinois

REPORT OF MINE PERFORMANCE - MONTH OF DECEMBER 1957 and 1958, AND ACCUMULATION-JANUARY THROUGH DECEMBER, 1957 and 1958 FOR ILLINOIS INDIANA AND WESTERN KENTUCKY, BY DISTRICTS

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
No. Ill.					
Peabody	No. Ill.	78,735 (20)	71,409 (22)	843,416 (241)	586,153 (172)
Fulton Co.					
Big Ten	Big Ten	15,304 (23)	17,723 (17)	171,942 (189)	151,889 (162)
Fairview	Flamingo	72,936 (17)	72,554 (17)	637,585 (155)	544,596 (127)
Peabody	Key	37,967 (18)	65,472 (24)	433,409 (208)	489,052 (207)
Midland	Mt.Grove	54,049 (22)	59,772 (22)	687,382 (262)	629,072 (222)
"	Vulcan	65,073	62,278 (22)	687,685 (211)	589,479 (189)
Morgan	Edwards	16,087 (26)	23,755 (25)	135,682 (276)	144,105 (247)
Stonefort	L. John	43,644 (18)	53,801 (20)	406,455 (169)	352,002 (146)
Truax	Piatt	136,657 (18)	151,587 (22)	1,486,983 (210)	1,600,348 (194)
"	L. Sister	48,825 (16)	76,171 (21)	591,889 (160)	575,821 (155)
United	Buckheart	113,678 (21)	119,490 (22)	1,234,861 (230)	1,151,297 (217)
"	Cuba	70,605 (17)	97,670 (23)	828,135 (211)	759,386 (176)
	TOTAL	664,825 (217)	800,273 (235)	7,302,008 (2281)	6,787,047 (2042)
Atkinson					
Midland	No. 2	66,750 (20)	63,233 (26)	872,045 (261)	489,796 (188)
	No. 5	49,115 (21)	90,792 (26)	162,936 (102)	584,279 (190)
	TOTAL	115,865 (41)	154,025 (52)	1,034,981 (363)	1,074,075 (378)
Cent. Ill.					
Peabody	#17	127,830 (12)	-	2,060,583 (200)	-
Freeman	Crown	158,242 (16)	178,125 (18)	1,602,483 (176)	1,578,624 (166)
Peabody	#10	293,683 (18)	304,205 (18)	3,677,756 (227)	2,902,214 (171)
	TOTAL	579,755 (46)	482,330 (36)	7,340,822 (603)	4,480,838 (337)
Danville					
B & Z	Murdock	37,063 (19)	46,691 (23)	421,868 (237)	477,006 (233)
Fairview	Hanratten	74,441 (19)	99,156 (23)	672,777 (170)	720,184 (176)
United	H.Moore	26,655 (15)	31,650 (19)	315,829 (175)	282,609 (170)
	TOTAL	138,159 (53)	177,497 (65)	1,410,474 (582)	1,479,799 (579)

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
Belleville					
Mt.O.&St.	Staunton	-	-	198,146 (75)	-
B &Z	Spartan	49,513 (14)	79,569 (22)	624,493 (170)	626,313 (174)
Lusaghi	#4	56,378 (18)	77,187 (23)	572,559 (179)	530,089 (158)
Mid-Cont.	Gr. Dia.	66,260 (21)	84,062 (26)	720,454 (223)	804,808 (260)
Sv. Ill. Co.	Streamline	85,882 (20)	113,059 (26)	816,650 (204)	963,046 (232)
Morgan	Millstadt	12,825 (22)	15,879 (26)	100,200 (184)	97,497 (172)
Peabody	Nlv. King	151,528 (20)	139,480 (20)	552,365 (96)	1,695,017 (238)
"	Seminole	66,437 (21)	75,959 (25)	648,071 (227)	671,608 (215)
"	Mid. Mad.	71,667 (24)	80,590 (26)	670,103 (214)	681,068 (220)
"	St. Ellen	128,102 (21)	144,623 (26)	1,226,491 (221)	1,285,444 (221)
Truax	Pyramid	80,270 (13)	128,400 (20)	995,856 (160)	1,096,897 (175)
United	Fidelity	92,110 (15)	121,258 (20)	1,240,418 (220)	1,138,854 (185)
	TOTAL	860,972(209)	1,060,026(260)	8,366,106(2203)	9,590,631(2231)
DuQuoin					
Truax	Burn.Star	100,458 (19)	114,901 (21)	1,087,890 (210)	1,100,143 (204)
So. Ill.					
Blue Bird	-	-	-	151,901 (86)	-
B & Z	Zeig.#3	92,357 (18)	129,804 (25)	938,095 (195)	1,104,103 (207)
"	Buckhorn	77,980 (16)	90,523 (23)	757,022 (168)	869,142 (193)
Carmac	Carmac	29,986 (20)	33,145 (21)	315,158 (214)	262,148 (162)
"	Delk	78,334 (21)	92,958 (26)	784,781 (213)	835,847 (226)
For. Cart.	F.Mason	15,800 (11)	20,576 (15)	185,215 (118)	159,696 (106)
Freeman	Orient #2	108,909 (17)	119,209 (20)	1,072,758 (169)	1,071,377 (173)
"	Orient #3	233,160 (18)	266,552 (23)	3,010,200 (237)	3,032,633 (238)
"	Freeman #4	102,928 (20)	106,933 (21)	1,220,034 (245)	1,189,907 (242)
Peabody	Herrin	37,643 (19)	54,472 (26)	409,530 (215)	406,130 (202)
"	#43	-	-	220,708 (50)	-
Old Ben	#9	161,455 (19)	172,015 (21)	1,851,850 (218)	1,972,739 (230)
"	#14	100,804 (19)	126,190 (22)	970,128 (193)	1,089,585 (213)
"	#22	68,418 (19)	86,104 (24)	678,284 (188)	536,757 (138)
Sahara	#5	52,549 (18)	70,249 (22)	556,879 (185)	569,378 (190)
"	#6	51,707 (15)	68,527 (18)	589,675 (169)	622,113 (172)
"	#7	-	-	62,475 (107)	-
"	#16	54,738 (17)	74,997 (21)	588,409 (183)	559,302 (179)
Stonefort	Will. Scar.	54,838 (21)	70,808 (24)	747,083 (240)	735,624 (240)
Utility	Utility	-	27,723 (23)	-	160,572 (173)
TOTAL SOUTHERN ILL.		1,321,406(288)	1,610,785(375)	15,110,185 (3623)	15,157,053 (3284)
TOTAL ILLINOIS		3,870,175(893)	4,471,246 (1066)	42,195,882 (9906)	40,255,739 (9227)

INDIANA

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
Clinton					
Ayrshire	Chinook	52,743 (19)	56,462 (18)	495,066 (164)	514,629 (172)
"	Sunspot	9,636 (8)	26,345 (19)	70,441 (47)	113,364 (75)
Snow Hill	Lloydale	40,378 (18)	38,074 (20)	507,562 (230)	442,753 (218)
"	Gr. Valley	111,662 (20)	136,231 (24)	1,288,239 (241)	1,297,921 (235)
Bledsoe	Viking (Conv.)	45,580 (17)	52,754 (22)	629,109 (237)	581,085 (232)
	TOTAL	259,799 (82)	309,866 (103)	2,990,417 (919)	2,979,752 (932)
Linton					
Enoco	Enoco	58,097 (17)	69,268 (21)	731,873 (210)	666,039 (189)
Fairview	Minnehaha	44,234 (21)	53,852 (26)	421,148 (203)	434,214 (203)
Haumee	Chelfton	50,394 (17)	61,013 (21)	478,165 (161)	472,690 (154)
"	Linton #28	28,895 (13)	45,322 (21)	313,262 (150)	310,835 (136)
"	Old Glory	14,195 (10)	15,638 (13)	119,552 (99)	113,659 (92)
"	Airline	76,496 (21)	97,492 (22)	717,563 (240)	760,478 (232)
Morgan	Kingman	5,294 (16)	8,314 (23)	41,803 (135)	47,601 (137)
Shasta	Shasta	29,680 (13)	31,967 (14)	348,317 (162)	330,538 (143)
Sher. Temp.	Friar Tuck	44,536 (16)	55,587 (20)	481,829 (162)	425,450 (147)
	TOTAL	351,821 (144)	438,453 (181)	3,653,512 (1522)	3,561,504 (1433)
Princeton					
Ayshire	Ayr. (BC)	22,712 (13)	36,001 (19)	312,451 (166)	287,630 (147)
"	Ayr. (Cato)	19,353 (13)	17,637 (11)	198,165 (117)	132,011 (82)
Blackfoot	Blackfoot	78,620 (25)	83,859 (26)	667,104 (208)	650,859 (215)
Enos	Enos	147,157 (23)	181,188 (26)	1,476,476 (236)	1,432,891 (212)
Ingle	Dit. # 111	43,218 (16)	47,130 (24)	476,272 (153)	351,229 (143)
Peabody	Lynnville	115,811 (14)	130,931 (14)	1,295,670 (183)	994,913 (131)
"	Tecumseh	84,756 (17)	106,589 (21)	837,821 (143)	743,248 (144)
Princeton	King Sta.	41,303 (13)	64,610 (21)	318,990 (97)	434,560 (136)
	TOTAL	552,926 (134)	687,945 (162)	5,582,949 (1303)	5,027,341 (1210)
Boonville					
Boonville	Wright	91,993 (21)	95,864 (20)	1,077,041 (211)	1,052,137 (203)
Peabody	Victoria	118,195 (20)	82,977 (14)	1,122,214 (202)	1,135,491 (187)
TOTAL BOONVILLE -		210,188 (41)	178,841 (34)	2,199,255 (413)	2,187,628 (390)
TOTAL INDIANA -		1,374,734 (401)	1,595,105 (480)	14,426,133 (4157)	13,756,225 (3965)

1840

WESTERN KENTUCKY

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
W. Kentucky					
Gibralter	Gibralter	129,286 (22)	160,074 (21)	1,588,595 (243)	1,626,376 (233)
Beech Cr.	Pond Cr.	37,724 (19)	38,107 (19)	416,037 (220)	401,861 (210)
B & Z	Moss Hill	16,091 (20)	20,702 (25)	123,796 (159)	159,513 (188)
"	Oriole	65,265 (16)	84,779 (21)	745,834 (181)	784,493 (184)
Colonial	Colonial	51,289 (19)	61,161 (21)	710,054 (250)	668,268 (222)
Paradise	Paradise	63,987 (19)	136,461 (20)	875,317 (245)	1,120,153 (241)
P. & Mid.	Dekoven	114,410 (20)	78,409 (18)	929,061 (249)	971,697 (244)
Dawson	Collierie	31,928 (20)	32,272 (22)	311,717 (207)	352,225 (224)
Dawson	Daylight	34,525 (20)	33,977 (22)	325,530 (210)	345,836 (223)
Hart	Pr. Washed	63,283 (24)	56,876 (21)	726,532 (264)	682,587 (242)
Kirkpat.	Caney Cr.	51,516 (20)	52,573 (19)	540,501 (230)	548,255 (227)
Peabody	Vogue	60,384 (25)	143,150 (23)	462,199 (/)	1,078,648 (228)
"	Ken	169,915 (17)	208,825 (24)	2,197,139 (254)	2,066,959 (219)
"	Riv. Queen	96,884 (23)	256,507 (26)	180,075 (48)	2,161,565 (249)
"	P. River	35,491 (12)	69,217 (26)	257,267 (/)	571,678 (208)
"	Wh. City	142,530 (24)	136,498 (24)	1,372,410 (226)	1,213,610 (200)
"	Old Homes	30,733 (20)	-	405,926 (/)	149,046 (75)
"	Alston	-	-	149,682 (71)	-
"	Seneca	-	-	433,469 (140)	-
United	Buff. Cr.	30,141 (21)	22,016 (17)	250,778 (152)	195,429 (127)
*(R.C.J.)	Ruby	51,019 (20)	55,397 (19)	642,075 (246)	620,110 (239)
W.Ky.Coal K.	Diamond	95,715 (16)	128,936 (22)	1,312,806 (208)	1,212,219 (198)
"	Pl. View	108,921 (18)	121,969 (20)	1,375,610 (221)	1,202,891 (203)
"	Atkinson	51,660 (11)	-	480,265 (115)	206,934 (52)
"	Pies	70,501 (14)	97,619 (17)	1,012,233 (191)	1,034,853 (179)
"	Crescent	46,984 (15)	60,009 (16)	711,980 (193)	637,355 (179)
"	Uniontown	114,580 (16)	97,746 (19)	1,275,036 (198)	1,066,692 (165)
"	Williams	38,018 (20)	42,239 (22)	364,076 (205)	424,229 (206)
TOTAL W. KENTUCKY		1,802,780(491)	2,195,519(504)	20,175,980(%)	21,503,482 (5165)
TOTAL ILLINOIS		(1785)	(2050)		(18,357)
INDIANA, AND WESTERN KENTUCKY		7,037,689	8,261,870	77,097,995(%)	75,515,446
TOTAL - UNITED STATES				492,195,000*	398,448,000*

Report No. 12

* - Estimated.
/ - Not available
% - Incomplete - so not shown.
( )- Days Worked.

January 8, 1959

1841 Terlike Dep. Ex. 11, Id.
CY 12-14-67 1675

GOVERNMENT EXHIBIT Ter. Dep. 11

MID-WEST COAL PRODUCERS INSTITUTE, INC.
307 North Michigan Avenue
Chicago, Illinois

REPORT OF MINE PERFORMANCE - MONTH OF DECEMBER 1966 AND 1967 AND ACCUMULATION - JANUARY THROUGH DECEMBER 1966 AND 1967 FOR ILLINOIS, INDIANA AND WEST KENTUCKY, BY DISTRICTS

Company by Districts	Mine	1966 December Tons & Days Worked	1967 December Tons & Days Worked	1966 Jan. thru Dec. Tons & Days Worked	1967 Jan. thru Dec. Tons & Days Worked
So. Ill.					
Peabody	No. Ill.	84,158 (26)	82,047 (25)	927,574 (265)	753,845 (256)
Fulton Co.					
Ayrshire	Sun Spot	77,010 (26)	89,623 (25)	761,601 (256)	803,117 (255)
Mid. Elec.	Mid. Grove	112,775 (19)	96,630 (18)	1,657,262 (253)	1,373,647 (222)
Peabody	Sri. Star	50,579 (19)	52,918 (23)	542,903 (213)	548,783 (222)
"	Edwards	54,149 (26)	26,149 (16)	489,132 (267)	526,431 (266)
"	Key	—	—	211,006 (88)	—
Pioneer	#1	15,082 (24)	20,609 (25)	116,099 (245)	127,507 (210)
Stonefort	Allendale	68,217 (24)	42,359 (20)	590,374 (210)	570,665 (221)
Truax	Piatt	148,841 (20)	242,889 (24)	1,603,670 (210)	1,523,055 (222)
"	L. Sister	84,630 (21)	—	983,335 (223)	917,864 (223)
United	Banner	74,994 (25)	65,180 (24)	809,240 (276)	834,021 (280)
"	Buckheart	141,139 (18)	204,267 (24)	2,033,621 (240)	1,903,933 (239)
"	Cuba	94,839 (21)	57,883 (14)	931,826 (213)	973,987 (220)
	TOTAL	922,255 (243)	898,507 (213)	10,730,069 (2694)	10,093,010 (2580)
Atkinson					
Mid. Elec.	Kecco	140,015 (24)	123,552 (24)	1,218,131 (238)	1,248,864 (237)
Cent. Ill.					
Freeman	Crown	215,672 (22)	176,494 (17)	2,284,278 (242)	2,380,150 (252)
Peabody	#10	501,158 (21)	493,029 (21)	5,634,795 (247)	5,711,599 (254)
Truax	Hillsboro	96,425 (21)	86,694 (18)	1,017,106 (239)	1,169,007 (232)
	TOTAL	814,255 (64)	756,217 (56)	8,936,179 (728)	9,260,756 (738)
Danville					
Ayrshire	Harrattan	62,042 (17)	61,181 (18)	777,792 (192)	568,058 (172)
B & Z	Murdock	66,038 (21)	59,496 (21)	653,624 (234)	745,786 (246)
	TOTAL	128,080 (38)	120,680 (39)	1,431,416 (426)	1,313,844 (418)

Company by Districts	Mine	1966 December Tons & Days Worked	1967 December Tons & Days Worked	1966 Jan. thru Dec. Tons & Days Worked	1967 Jan. thru Dec. Tons & Days Worked
Belleville					
B & Z	Spartan	75,261 (21)	83,336 (21)	826,485 (236)	882,421 (237)
Kid. Elec.	Gr. Dia.	—	—	259,292 (73)	—
Peabody	Midwest	118,906 (26)	110,565 (24)	1,273,090 (295)	1,410,796 (288)
"	Riv.King	419,519 (25)	433,912 (25)	4,453,420 (282)	5,316,366 (289)
Sw.Ill.Coal	Captain	530,650 (26)	487,840 (28)	5,196,407 (353)	5,807,683 (344)
" " "	Streamline	167,775 (26)	93,286 (21)	1,590,390 (292)	1,718,903 (300)
Truax	B.Star #2	114,687 (19)	66,253 (14)	1,481,342 (227)	1,482,843 (233)
"	B.Star #3	245,058 (21)	167,008 (22)	1,378,540 (132)	1,613,575 (256)
United	Fidelity	190,317 (24)	149,572 (21)	2,080,251 (269)	2,031,157 (265)
	TOTAL	1,862,173 (188)	1,591,772 (176)	18,542,217 (2159)	20,463,744 (2212)
DuQuoin					
Truax	B.Star #1	—	—	396,219 (94)	—
So. Ill.					
Ayrshire	Delta	75,198 (20)	73,185 (19)	787,442 (213)	996,808 (260)
B & Z	Zeig.#3	5,387 (3)	—	712,580 (210)	—
" "	Zeig.#4	96,773 (20)	100,815 (20)	1,073,150 (242)	1,270,193 (252)
Freeman	Orient #3	295,375 (22)	226,823 (18)	2,767,835 (236)	3,026,857 (254)
"	Orient #4	104,671 (19)	110,366 (17)	1,112,600 (239)	1,385,606 (247)
"	Orient #5	152,288 (22)	119,930 (13)	1,541,997 (252)	1,567,883 (229)
Old Ben	# 9	117,068 (20)	60,640 (12)	1,664,778 (253)	1,384,188 (239)
" "	#21	229,486 (22)	137,163 (16)	2,625,398 (264)	2,235,521 (255)
" "	#24	227,270 (23)	163,650 (18)	1,752,692 (271)	2,369,830 (272)
Peabody	Eagle	—	21,247 (13)	—	309,668 (124)
"	Energy	33,670 (20)	44,341 (23)	521,423 (246)	505,000 (247)
"	Utility	35,876 (22)	29,946 (18)	433,456 (237)	517,551 (257)
Sahara	# 5	64,596 (19)	68,768 (22)	796,472 (228)	753,835 (245)
"	# 6	86,733 (15)	82,489 (17)	1,024,185 (202)	1,082,170 (202)
"	#16	96,196 (20)	83,084 (21)	1,014,182 (229)	987,521 (241)
Stonefort	Will Sc.	120,280 (25)	88,692 (23)	1,133,518 (227)	1,380,861 (271)
	TOTAL	1,740,867 (292)	1,409,033 (270)	18,961,708 (3549)	19,791,446 (3595)
TOTAL ILLINOIS		5,691,803 (875)	4,981,808 (803)	61,143,513 (10,173)	62,925,509 (10,036)

1843

INDIANA

Company by Districts	Mine	1966 December Tons & Days Worked	1967 December Tons & Days Worked	1966 Jan. thru Dec. Tons & Days Worked	1967 Jan. thru Dec. Tons & Days Worked
Clinton					
Ayrshire	Chinook	101,911 (26)	97,940 (25)	1,145,755 (274)	1,163,071 (281)
Linton					
Ayrshire	Minnehaha	108,092 (20)	152,898 (21)	1,579,344 (244)	1,742,214 (243)
"	Thunderbd.	120,728 (23)	10,832 (6)	1,256,157 (258)	986,286 (207)
Peabody	Air.-Mavt.	94,772 (23)	184,682 (22)	1,651,196 (233)	2,421,227 (274)
"	Chieftain	42,525 (13)	48,211 (16)	469,351 (129)	480,328 (154)
"	Old Glory	77,739 (26)	59,744 (24)	707,304 (238)	596,321 (224)
	TOTAL	443,856(105)	456,367 (89)	5,663,652(1102)	6,226,376(1102)
Princeton					
Enos Coal Corp.	Blackfd/S	140,859 (26)	120,644 (20)	1,434,692 (247)	1,457,797 (251)
	Enos	157,591 (23)	142,239 (24)	1,570,314 (229)	1,673,122 (244)
Kings StCoal	Kings	10,975 (8)	66,130 (23)	72,419 (52)	337,189 (192)
Peabody	Lynnville	267,204 (26)	283,184 (23)	2,958,225 (287)	3,398,064 (285)
Princeton	King Sta.	—	—	170,180 (59)	—
	TOTAL	576,629 (83)	612,197 (90)	6,205,830 (874)	6,866,172 (972)
Robinville					
Ayrshire	Wright	109,261 (23)	100,990 (25)	1,174,545 (243)	1,300,557 (272)
Peabody	Victoria	62,300 (17)	61,837 (17)	721,942 (155)	898,713 (210)
	TOTAL	171,561 (40)	162,827 (42)	1,896,487 (398)	2,199,270 (482)
TOTAL INDIANA		1,293,957 (254)	1,329,331 (246)	14,911,724 (2646)	16,454,889 (2837)

1844

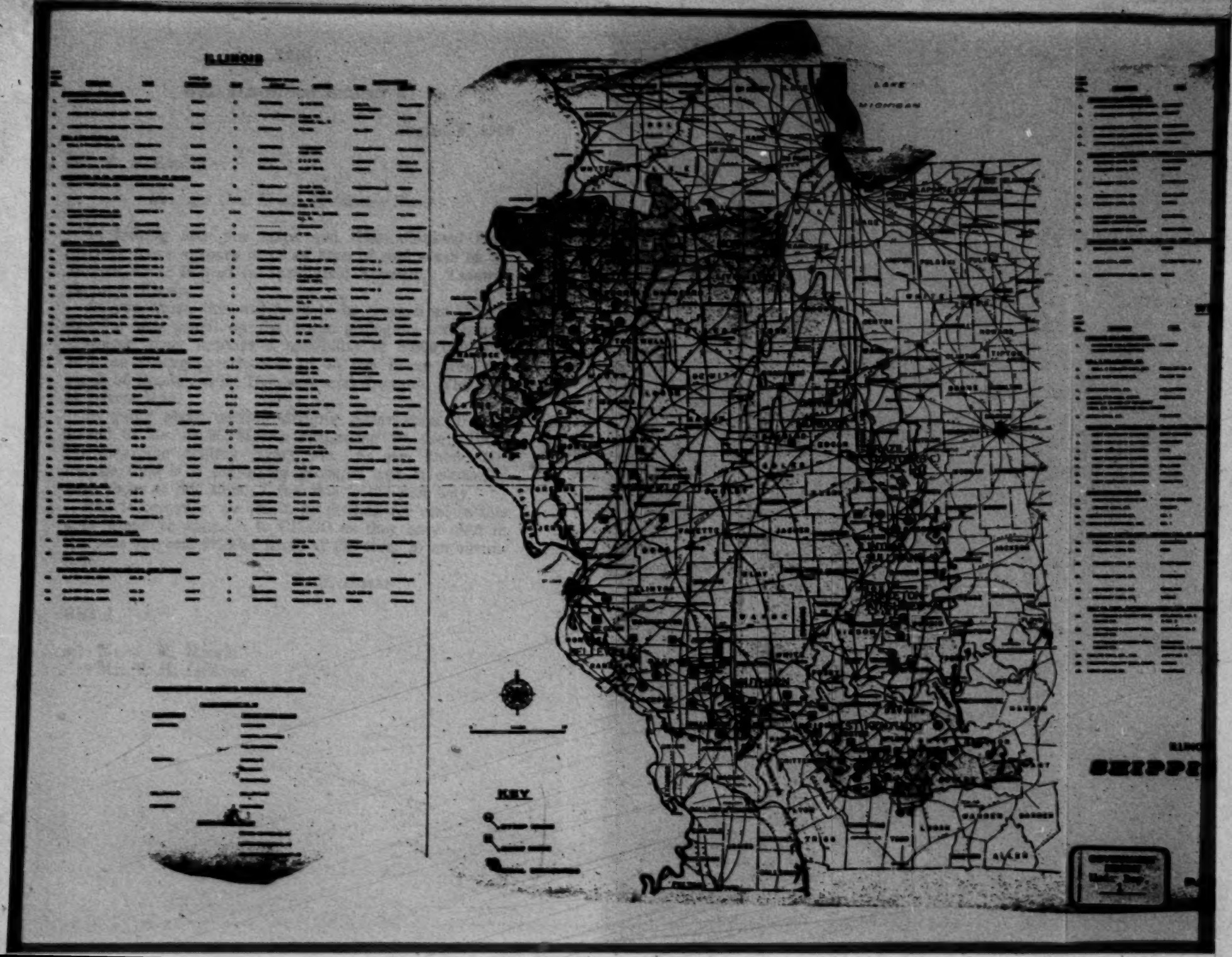
WEST KENTUCKY

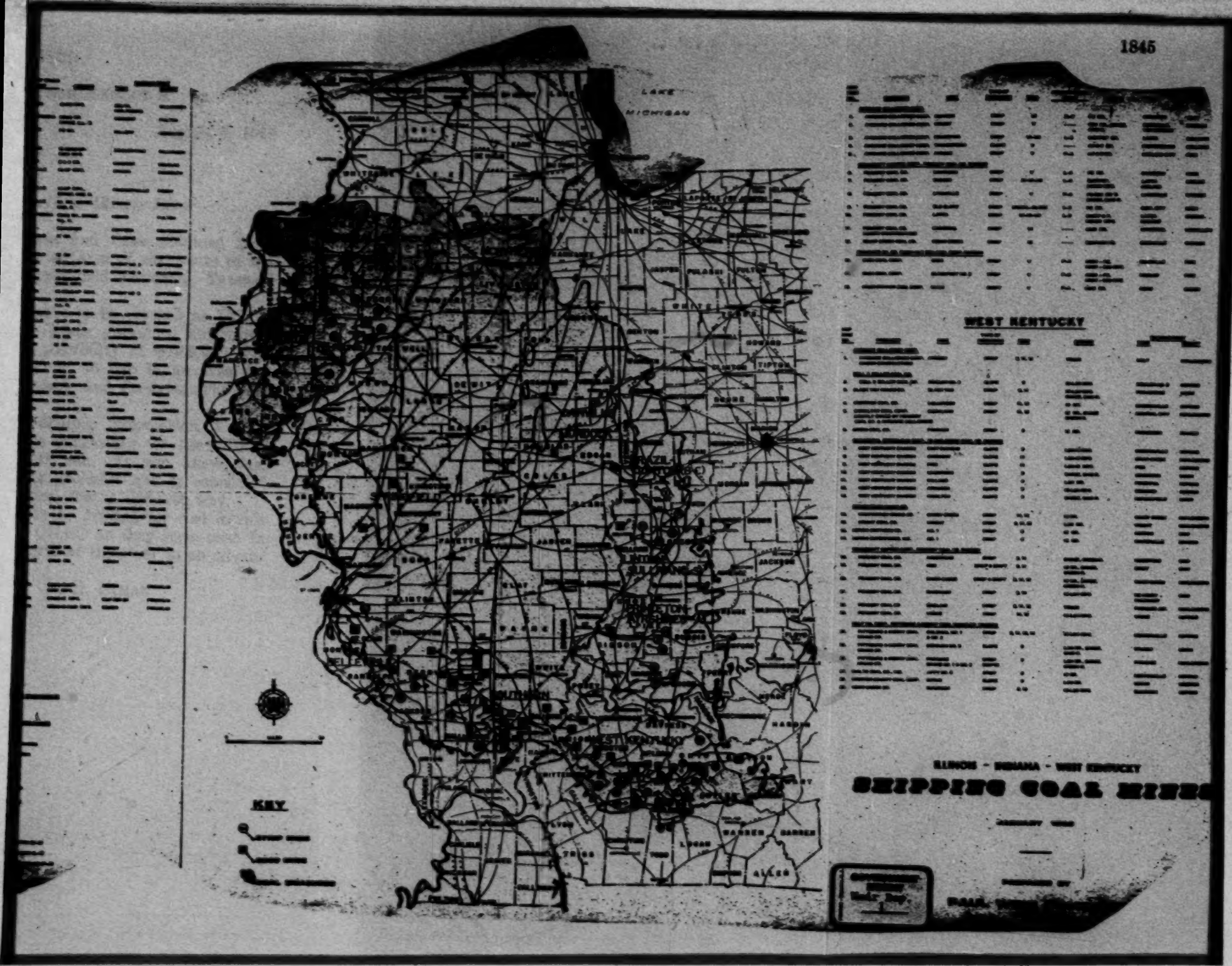
Company by Districts W. Kentucky	Mine	1966 December Tons & Days Worked	1967 December Tons & Days Worked	1966 Jan. thru Dec. Tons & Days Worked	1967 p Jan. thru Dec. Tons & Days Worked
Gibraltar	Gibraltar	207,147 (26)	233,138 (25)	2,105,676 (252)	2,087,820 (244)
B & Z	Oriole	96,732 (21)	—	917,980 (216)	631,713 (200)
" "	Zeig. #9	—	138,129 (24)	—	410,808 (74)
Colonial	Colonial	155,226 (23)	154,555 (18)	1,347,999 (220)	2,022,205 (261)
Paradise	Paradise	284,528 (19)	208,206 (17)	2,684,577 (207)	2,090,546 (193)
P. & Mid.	DeKoven	366,751 (23)	183,853 (20)	3,214,904 (236)	2,936,755 (257)
" " "	Drake	—	2,280 (8)	—	2,280 (8)
Kirkpatrick	Caney Cr.	71,928 (19)	54,977 (18)	760,896 (210)	879,355 (234)
Peabody	Homestead	210,284 (26)	192,109 (24)	2,229,691 (258)	2,353,431 (285)
"	Ken	171,497 (25)	200,326 (21)	2,456,417 (268)	2,379,106 (261)
"	Riv.Queen	391,657 (26)	457,401 (25)	3,809,422 (284)	5,043,519 (300)
"	Riverview	83,602 (23)	84,193 (17)	584,434 (237)	1,054,354 (262)
"	Vogue	267,687 (26)	161,328 (24)	2,563,213 (269)	2,703,110 (272)
W.Ky.Div.	Atkinson	138,776 (23)	134,441 (22)	1,089,700 (227)	1,471,874 (252)
(Island Cr.	Boone	34,363 (19)	31,619 (15)	242,769 (167)	418,394 (204)
Coal Co.)	Crescent	97,659 (22)	69,084 (22)	989,591 (222)	1,048,894 (245)
"	East Dia.	268,364 (23)	170,226 (19)	2,370,146 (219)	2,374,379 (243)
"	Flex	135,649 (22)	138,681 (22)	1,222,766 (216)	1,443,424 (245)
"	Pl.View	52,164 (16)	—	520,710 (175)	565,814 (163)
"	Uniontown	144,456 (23)	122,924 (22)	1,461,989 (221)	1,490,635 (249)
"	Williams	24,305 (22)	22,556 (20)	234,174 (216)	236,497 (216)
"	Was.Slurry	4,276 (3)	—	29,446 (22)	11,050 (7)
Wright Coal	Wright	42,871 (21)	39,356 (20)	525,642 (213)	521,079 (238)
TOTAL W. KENTUCKY		3,229,902 (451)	2,819,382 (403)	31,162,142 (4557)	34,177,042 (4912)
TOTAL - ILLINOIS, INDIANA AND WEST KENTUCKY		10,215,662 (1580)	9,130,521 (1452)	107,217,379 (17,378)	113,557,440 (17,785)

Report No. 120

( ) Days Worked

January 12, 1968


ILLINOIS
LAKE
MICHIGAN
KEY


LAKE
MICHIGAN
WEST KENTUCKY
KEY

WEIR DEPOSITION EXHIBIT 8

August 5, 1959

Mr. R. J. Hepburn:

Re: #2 Coal South of Illinois River

In looking over our maps and those obtained from CILCO, there appears to be an area of coal south of the Illinois River located in Springfield Township, Tazewell County, Illinois.

As you know, this will have to be checked as CILCO drilling was intent on the lower geological structures. However, there appears a possibility of 8,000,000 tons with an average overburden of 35 feet in an area due south of Bessie Smith, Dempsey, and Sprague. The land is bottom land.

In going about getting drilling information, I have talked to Mr. J. M. Morris suggesting we use CILCO for obtaining drilling rights, etc. As you know, Mr. George Otto is a consulting geologist and is connected with them at this time. I feel this is the best way.

Any information we obtain by drilling for coal in this area would be valuable to CILCO as they have used in the past our coal drilling north of the river to an advantage.

R. H. INMAN

RHI:J

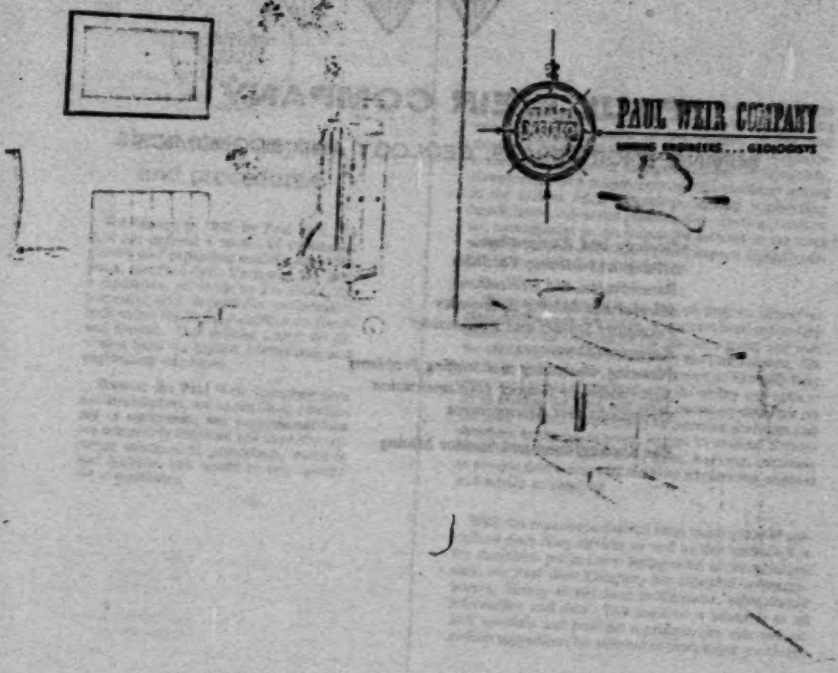
cc: Mr. J. M. Morris
Mr. T. H. Latimer

Weir Dep. Ex. 19-
8/5/76

PAUL WEIR COMPANY

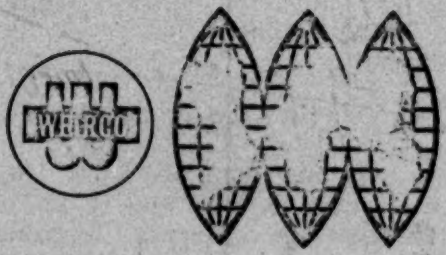
2828

Weir Dep. Ex. 19
8/5/69



1849

SERVING THE MINING INDUSTRY SINCE 1936



PAUL WEIR COMPANY

MINING ENGINEERING, GEOLOGY AND ECONOMICS

Geology and Exploration
Mining and Mining Facilities
Beneficiation and Utilization
Mineral and Mining Economics
Feasibility Studies and Evaluations
Resources Development
Planning, Budgeting and Staffing Problems
Supervision of Project Implementation
Operations and Management

For Underground and Surface Mining

20 NORTH WACKER DRIVE • CHICAGO, ILLINOIS 60606 • AREA CODE 312 346-0275 • CABLE ADDRESS WEIRCO

about our company and procedures

Established in 1936 by Paul Weir, the firm has enjoyed a record of continuous growth and expanding activity. Over the years, the Paul Weir Company has built a reputation, of which we are proud, for successful and dependable performance both within the North American continent and abroad. Our policies permit no deviation from the highest professional and engineering standards.

Because the Paul Weir Company does not manufacture, sell or distribute machinery or equipment, our recommendations are completely unbiased and impartial, assuring selection of procedures, methods and facilities best suited to any specific set of conditions.

Upon authorization for any assignment, whether large or small, the principal officers of the Paul Weir Company first analyze all aspects of the project, outline and supervise the necessary work, then prepare or review the eventual final report or recommendation. Additionally, throughout every project, any special problems arising in the various fields of geology, mining, engineering, beneficiation, utilization, construction, training, economics, management or operations are referred to the close scrutiny of those principals or staff experts highly qualified in the particular field involved.

When staffing teams in the field on projects abroad we place emphasis on the ability of our personnel to function without friction both within the company group and with the technical staff and residents of the host country. On major projects abroad we are prepared to establish fully integrated teams in the field with the ability and authority to execute the work and make necessary decisions on the spot, without the necessity of referring problems and decisions to the home office, except in unusual circumstances. The home office at all times, however, continues to provide field teams with back-up information, support and advice as required.

With the experience derived from many years of specialized consulting services as well as that embodied in the combined professional background of the principal staff, the Paul Weir Company has compiled a comprehensive library of technical publications, authoritative information and data. This material is available to all staff members and provides supplementary aids and expedient suggestions for solution of new project problems.

SERVICES

The Paul Weir Company offers a complete range of consulting and engineering services on a world-wide basis to owners, producers and users of coal, other solid fuels, and mineral resources in general.

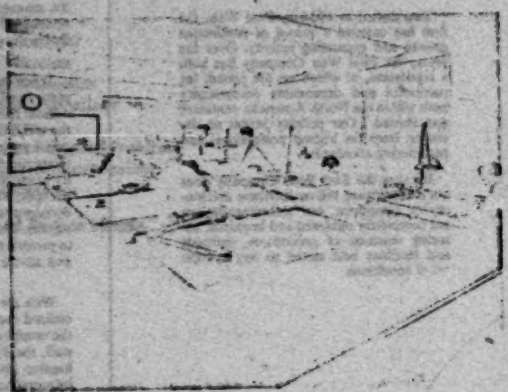
It serves owners and operators of mineral properties, public utilities, railroads, financial institutions, insurance companies, industrial users and government agencies.

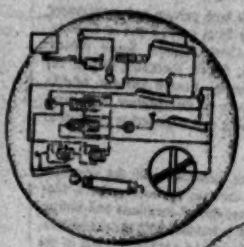
The Paul Weir Company is prepared to execute both field work and/or office work as required. Teams of selected specialists can be provided for short-term assignments in the field or in the office, or fully integrated technical teams can be put in the field and maintained any place in the world for comprehensive long-term projects.

In the development of operating projects—and especially those located in newly developing areas of the world—control practices for labor, materials and maintenance are established as required to fit local conditions in order to achieve effective preventive maintenance and maximum effectiveness and economy of each facility involved. Training seminars are conducted for local supervisory personnel as required to assure effective implementation of such practices and programs.

For many clients, the Paul Weir Company has undertaken responsibilities beyond those associated with engineering services, such as the selection of personnel for top management and operating positions.

On the following pages are specific examples of what we do, which may serve as suggestions to our clients of ways in which we might be of service.





The services available to Weirco clients range from exploration and mapping of virgin deposits through any or all phases to final development of a project at full production level.

Geology and Exploration

Reconnaissance; field geology, mapping; supervision of drilling; sampling; interpretation of results.

Investigations, Surveys, Reports, Recommendations

Valuations and appraisals of physical and intangible property; analyses of virgin or active properties; overall economic and resource surveys; complete project feasibility studies, including engineering aspects, transportation, market, and projected costs; investigations of and recommendations on special problems or specific phases of operation or project.

Engineering and Design

Design and development of details of mines and mine plant; preparation of engineering drawings for installation and construction; determination of specifications and bills of material; engineering cost estimates.

Development and Construction

Recommendations, scheduling, coordination, organization and administration of development and construction; preparation of contracts and purchase orders; direct or advisory supervision of construction and erection; inspection and examination of and reports on construction and construction programs; supervision of acceptance tests; training of operating, maintenance and supervisory staff.

Mechanization

Determinations of potential extent, economic effect and practicable application of mechanized methods; recommendations on most appropriate types of equipment; design and supervision of installation of mining systems; critical analysis for improvement of methods; establishment of preventive maintenance programs and training of personnel.

Beneficiation

Investigation of coal and mineral preparation and beneficiation problems; determination of economic effect of and methods for quality improvement; development of flow sheets and designs; selection of facilities and supervision of erection and acceptance tests; research on solid fuel utilization and coal carbonization.

Management, Supervision and Administration of Operations

Administration and supervision of all phases of mining operations, either direct or advisory; organization of operating staff and selection of personnel; periodic review of operating policies and problems.

1853

EXPERIENCE

The Paul Weir Company has performed consulting and engineering services for numerous operating companies of all sizes. Specialized technical services have also been provided to a large variety of interests such as railroads, public utilities, financial groups and institutions. We have served the U. S. Departments of Interior, Health, Education and Welfare, and Justice; the Army Corps of Engineers; the Atomic Energy Commission; and various executive agencies of the government concerned with Foreign Aid.

Domestic assignments have been carried on throughout the U.S.A.

On work abroad our clients include both private and government interests. Foreign assignments have been carried out in Canada, Mexico, Brazil, Colombia, Chile, Great Britain, South Africa, North Africa, Australia, Indonesia, South Vietnam, Korea, the Philippines, Portugal, Turkey, Germany, France and the Middle East. Additionally, various members of our present staff have been personally associated with mining and engineering projects in other countries.

The Paul Weir Company has been associated with the investigation and development of coal and mineral deposits under a wide variety of physical occurrences, geographical locations and indigenous economic conditions. Our staff is familiar with the equipment, methods and techniques available from and applied in most of the industrially advanced nations. This broad experience can be utilized to find the most suitable and practicable answers to your problems.

1854

TYPICAL ASSIGNMENTS DOMESTIC AND FOREIGN

- *Mining Companies*
- *Financial Institutions*
- *Utilities*
- *Industrial Users*
- *Railroads*
- *Government Agencies*
- *and Others*

Supervised drilling program to establish reserves; layout and design of new shaft mine and preparation plant, followed by supervision of shaft sinking, mine development and surface construction. For a mining company.

Retained by a major chemical company for advisory services on all phases of mining of deep seam coal, a sodium carbonate mineral. Written reports on the development of mining methods, applications of equipment, and forward planning for production of this unique raw material for soda ash.

As part of a joint industrial group serving as general advisors and supervisors for overall economic and industrial development on a national level, Wilbur had responsibility for all services encompassing the mining field, including coal, ferrous and non-ferrous minerals. Resources investigated included uranium, lignite, lead, zinc, silver, gold, copper, iron, graphite, nickel and pyrite.

Modernization of mining in pitching beds, including recommendations for mechanization, haulage and haulage-slot programs with estimates of capital and operating costs. For a mining company in Canada.

TYPICAL ASSIGNMENTS DOMESTIC and FOREIGN
(continued)

Determination of source, costs of development and production of raw materials for a sulphuric acid plant, including surveying, mapping, and setting up a diamond drilling program.

Investigation of optimum coal basin by drilling program, followed by determination of mining and transportation costs to power plant, with comparison of reserves and competitive costs from other sources. A utility company.

A Welsco team composed of specialists in mining, beneficiation, mechanical and electrical engineering served as principal consultants (resident in the field) on the overall development and modernization of a coal field. Services also included training of local personnel in safety, maintenance and industrial engineering practices. The initial project involved a capital investment of more than 300 million dollars. Starting in late 1949 Welsco's services have been retained on subsequent expansion programs projected to 1975.

Investigation and report on conversion of shallow underground gypsum mine to a stripping operation, including recommendations on equipment, techniques, operating methods and costs.

For a cement plant, assignment included geological survey, supervision of core drilling and sampling, and reserve of all raw materials reserve findings to plant expansion. Studies included availability of fuel, power and water, and economic factors.

Feasibility study to evaluate existing coal strip mining operation, and analyze all transportation, marketing and economic factors related to possible expansion. Based on conclusions, recommendations for production expansion including mine design, equipment, method of operation, preparation plant, transport and handling facilities, and capital and operating cost estimates.

Investigation of strippable reserves followed by recommendations for operation and transportation and handling from mine plant to rail and river loading points. For a mining company.

Nation-wide analysis of coal reserves suitable for synthetic liquid fuel manufacture for United States Department of the Interior and Army Corps of Engineers.

For a lead smelter, ascertain tonnages, grades of ore and concentrates for profitable operation. Study and recommend improvements in facilities, operation and management.

1856

Critical review of all major areas of coal and lignite availability, nation-wide, for guidance of major oil company in evaluating studies of manufacture of chemicals and synthetic fuels, with determination of comparative data on quality, mineability and potential cost.

Mapping and geological exploration in a remote region to establish reserves, mining possibilities and economic justification for production and basic use of coal deposits under conditions of national economy. Followed by resident team of engineers (mining, mechanical, construction, transportation) to provide technical services on development of mine and facilities.

Detailed survey of management policy, organizational structure and personnel performance for multiple-mine producer, with critical rating of existing staff and recommendations for improvements in organizational framework.

At request of a private company, Weirco principals analyzed conditions and evaluated two government-owned mines for submission of tender to purchase.

Certification of strippable and underground reserves for multiple-mine producing company having operations in six states, for use in registration statement required by Securities and Exchange Commission.

Complete design, specifications and supervision of construction of 22,000-ton bulk storage warehouse for salt products, adapted for shipments received by rail, truck or water.

Analysis of multiple-mine anthracite company's practices and reserves, followed by recommendations on future programs for modernization of mines and plant facilities, decentralization of maintenance and repair, reduction of overhead, retrenchment in selected high-cost operations, sales policies, contract mining and labor relations.

A Weirco team installed and supervised operation of an experimental mine for determination of most economic methods of mining and appropriate types of equipment under conditions of unique coal occurrence.

Preparation of flow sheets, design and specifications for new coal preparation plants and accessory facilities for various major coal producers, steel companies and utility interests, foreign and domestic.

Special studies and investigations of mineral beneficiation problems, including development of recommended flow sheets for beneficiation plants.

Special study of coal pipelining, including factors of coal supply, utilization, economics, and competitive position as transport medium.

Appraisal and evaluation of all physical and intangible assets of two multiple-mine companies, including reserves and operating properties, for purpose of merger negotiations.

For acquisition of a major coal company by a major oil company, assigned by the interests to make the engineering and economic evaluation of coal company reserves, mines and mine plant, including projection of long-range production tonnage and operating costs. An equivalent assignment was executed for the financing interests for acquisition of a second major coal company by a large metal-mining company.

Weirco team of engineering and operating specialists (resident on site) served as consultants and advisers on underground and open-pit mining operations and expansion at a copper mines abroad.

For a large coal mine producer, study, specifications, engineering layout and design of storage facilities and live-walls overhead belt-conveying system.

Engineering design of two mine shafts and inclined shaft; specifications and engineering layout for crushing and screening station, belt-conveyor system, stockpiling and barge-loading facilities (5,000 t.p.h. capacity) for major coal-mining company.

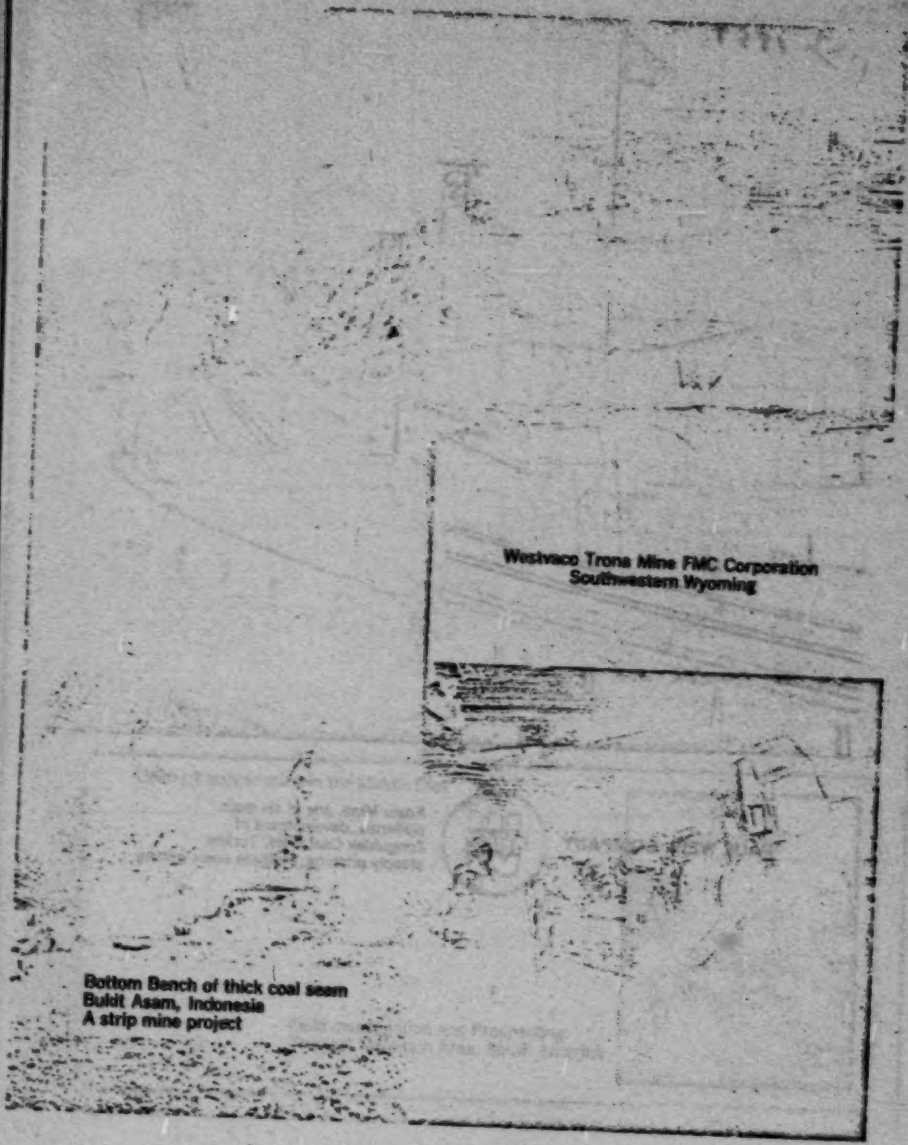
Detailed field exploration program to establish quantity and quality of high-grade metallurgical coal reserves; flow sheet and specifications for preparation plant; check of all design and structural drawings.

PAUL WEIR COMPANY

1857

Four and one-half mile belt conveying system
from mine to river loading facility.
Duquesne Light Company, Pennsylvania

PAUL WEIR COMPANY

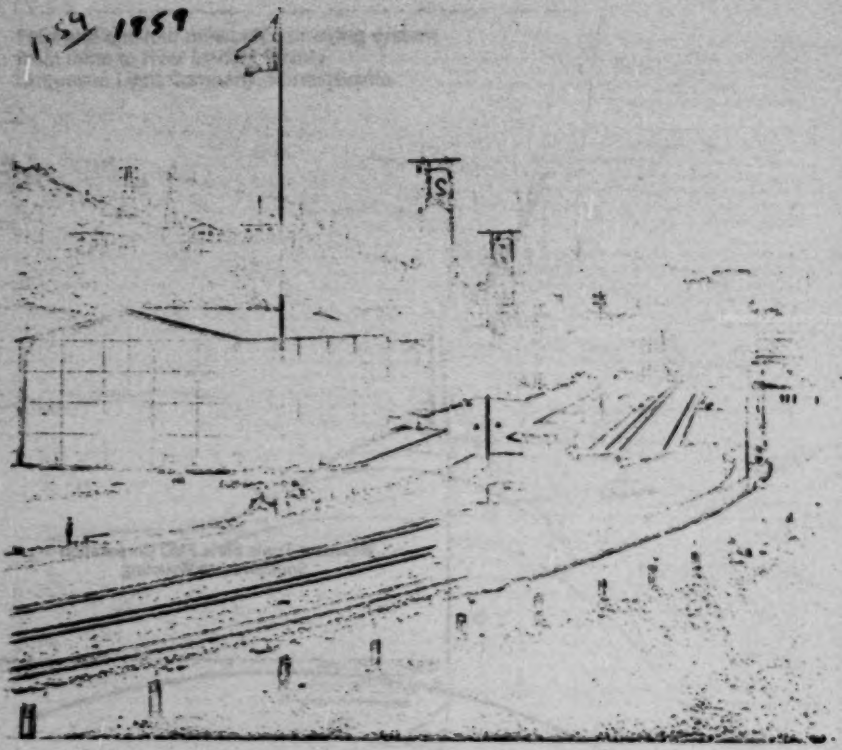


Westvaco Trona Mine FMC Corporation
Southwestern Wyoming

Bottom Bench of thick coal seam
Buildt Asam, Indonesia
A strip mine project

1859

1859 1859



PAUL WEIR COMPANY

Kozlu Mine, one of six main collieries, development of Zonguldak Coal Field, Turkey, steeply pitching, multiple seam mining

Open pit copper mine in the Middle East

Field Investigation and Prospecting
Tropical Mountain Area, South America

1861

PAUL WEIR COMPANY

PERSONNEL

The permanent staff of Paul Weir Company, based in Chicago, is a highly integrated team of experienced specialists of diverse capabilities—consultants, managers, engineers, geologists, designers, a comptroller and purchasing agent. Trained field engineers and supplementary technical staff are added as needed for projects anywhere in the world.

Through our years of steady growth we have selected our personnel carefully, with emphasis on technical training, practical experience, professional aptitude, sound judgment and analytical ability. Their accomplishments and abilities are measured by the results achieved for our clients (attested by the fact that much of our work is repeat business from a satisfied clientele) and by the recognition given them by their fellow professionals.

PROFESSIONAL MEMBERSHIPS INCLUDE:

American Institute of Consulting Engineers
American Institute of Mining, Metallurgical and Petroleum Engineers
American Institute of Professional Geologists
American Mining Congress
Coal Mining Institute of America
Illinois Mining Institute
Institution of Mining Engineers (U.K.)
Geological Society of America
Mine Inspectors Institute of America
Mining and Metallurgical Society of America
National Society of Professional Engineers
Rocky Mountain Coal Mining Institute
Society of Economic Geologists
Western Society of Engineers
American Association for the Advancement of Science
American Chemical Society
American Ordnance Association
National Association of Colliery Managers (U.K.)

PAUL WEIR

Chairman of The Board

Mr. Paul Weir received B.S. and E.M. degrees (Mining Engineering) from Pennsylvania State University. He is a Registered Professional Engineer, and is listed in *Who's Who in Engineering*.

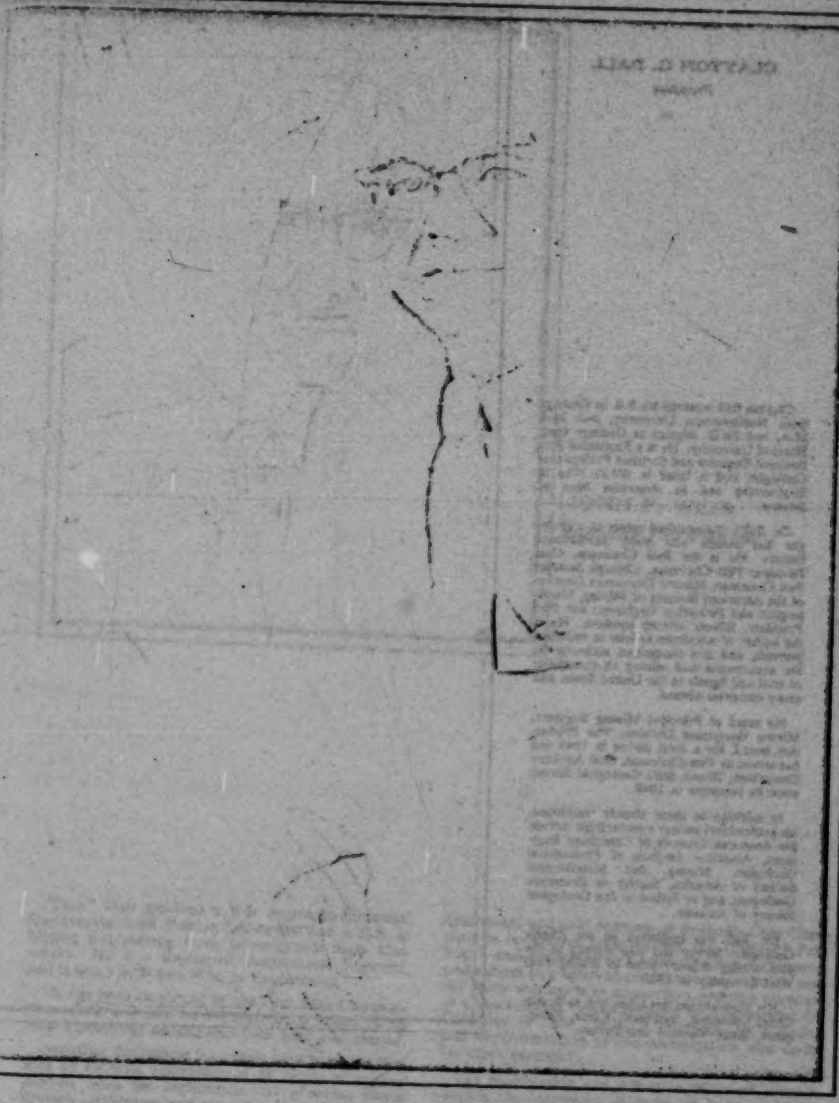
Mr. Weir, founder of the company, is recognised internationally for his achievements and contributions to the mining industry. He is considered one of the outstanding authorities on the valuation of mines. He was the recipient in 1949 of the Erskine Ramsay Gold Medal Award given by the American Institute of Mining Engineers for outstanding work and service to the coal mining industry. Pennsylvania State University rewarded him with its Distinguished Alumnus Award in 1954. In 1957, Mr. Weir was elected to Honorary Life Membership in the Institution of Mining Engineers (United Kingdom).

Prior to the formation of Paul Weir Company in 1936, Mr. Weir served as engineer, Chief Engineer, and Vice President in Charge of Operations of an Illinois coal mining company.

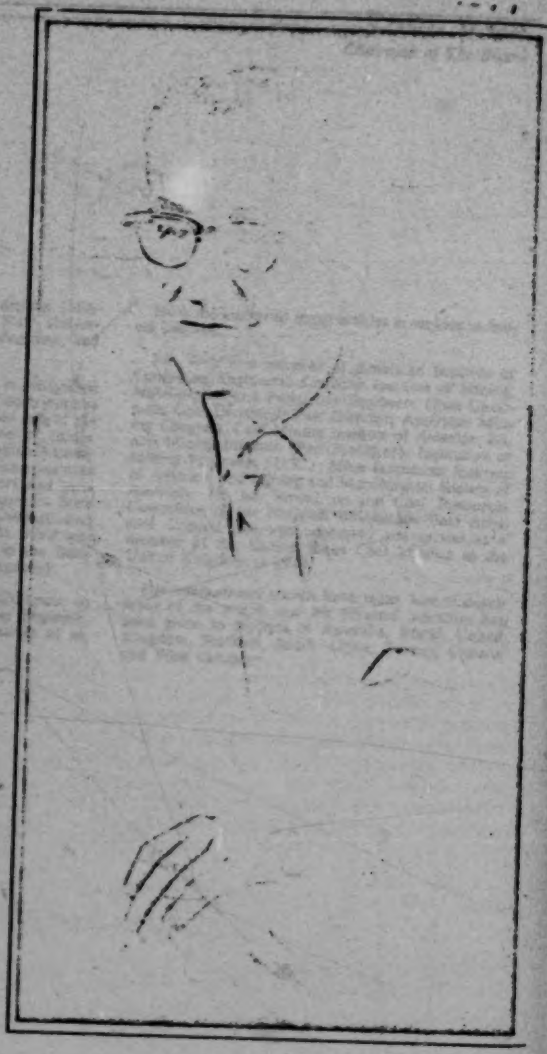
He is the author of many articles in various technical journals.

Mr. Weir is a member of American Institute of Consulting Engineers; American Institute of Mining, Metallurgical and Petroleum Engineers (Past Chairman, Coal Division); Past Director, American Mining Congress; Coal Mining Institute of America; Illinois Mining Institute (Past President); Institution of Mining Engineers (U.K.); Mine Inspectors Institute of America; and Mining and Metallurgical Society of America. He has served on the Coal Resources Committee of the National Bituminous Coal Advisory Council and was appointed and served as a member of the United States Coal Mission to the United Kingdom in 1944.

His international travels have taken him to many areas of the world, and his personal attention has been given to projects in Australia, Brazil, United Kingdom, Scotland, South Africa, Turkey, Canada and West Germany.



CLAYTON G. BALL
President



Clayton Ball received his B.S. in Geology from Northwestern University, and both M.A. and Ph.D. degrees in Geology from Harvard University. He is a Registered Professional Engineer and Certified Professional Geologist, and is listed in *Who's Who in Engineering* and in *American Men of Science*.

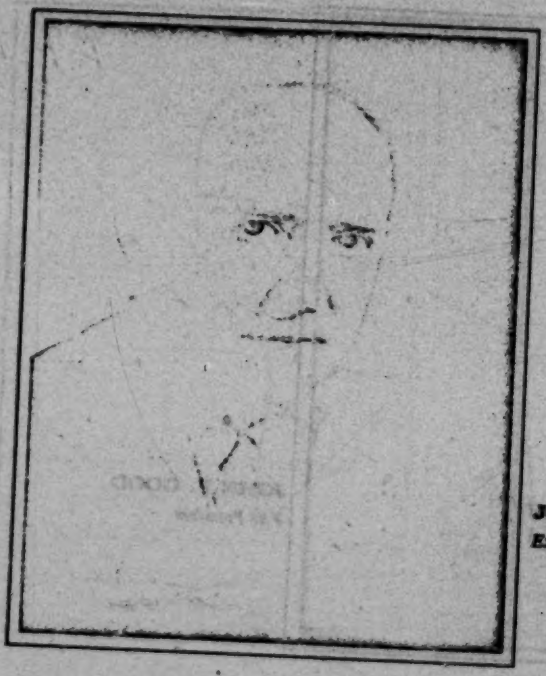
Dr. Ball's distinguished career as a geologist has covered nine years professional service. He is the Past Chairman, Coal Division; Past Chairman, Chicago Section; Past Chairman, Mineral Economics Division of the American Institute of Mining, Metallurgical and Petroleum Engineers; and Past President, Illinois Mining Institute. He is the author of numerous articles in technical journals, and is a recognized authority on the occurrence and mining characteristics of coal and lignite in the United States and many countries abroad.

He served as Principal Mining Engineer, Mining Equipment Division, War Production Board, for a short period in 1943 and has served as Vice-Chairman, Coal Advisory Committee, Illinois State Geological Survey since its inception in 1948.

In addition to those already mentioned, his professional society memberships include the American Institute of Consulting Engineers, American Institute of Professional Geologists, Mining and Metallurgical Society of America, Society of Economic Geologists, and as Fellow in The Geological Society of America.

Dr. Ball was employed by the Illinois Geological Survey and also worked in the coal mining industry prior to joining Pauli Weir Company in 1937.

His work abroad has taken him to Brazil, Chile, Colombia, Indonesia, Korea, Philippines, South Vietnam and Turkey.



JOHN P. WEIR
Executive Vice President

"Jack" Weir received a B.S. degree in Chemical Engineering from Purdue University and a B.S. in Mining Engineering from Pennsylvania State University. He is a Registered Professional Engineer, and is listed in *Who's Who in Engineering*.

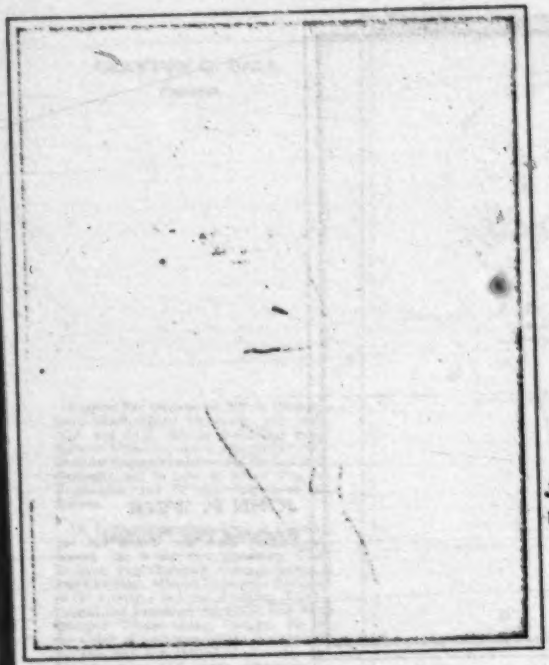
He has been employed by the Paul Weir Company since 1949 and has served Weirco on many of its most demanding assignments both here and abroad.

Activities throughout his career have provided him with an intimate knowledge of all facets of mining projects from the exploration and planning stages through application and operation of equipment and mining methods. Strata control has been one area of his major interests. The preparation of feasibility reports and reports for financing have often been his responsibility.

The Paul Weir Company prepared an independent engineering evaluation and economic study of the coal mines and coal reserves of Peabody Coal Company in connection with the sale (in 1968) of Peabody's coal properties to Kennecott Copper Corporation subject to a reserved production payment. A similar study was made in connection with the purchase of Consolidation Coal Company by Continental Oil Company in 1966. In both instance, the direction and implementation of the investigation was under his close control.

His membership and offices in technical societies include the American Institute of Mining, Metallurgical and Petroleum Engineers (serving as a Member of the Executive Committee, Coal Division), a Past President of the Illinois Mining Institute, Institution of Mining Engineers (U.K.), Rocky Mountain Mining Institute, and Western Society of Engineers.

His foreign assignments have included Australia, Germany and South Africa.



JOHN E. GOOD
Vice President

Mr. Good received his B.S. degree in Mining Engineering from Virginia Polytechnic Institute. He subsequently taught extension school classes in mining for Pennsylvania State University for several years. He joined Paul Weir Company in 1950.

Before joining Paul Weir Company, he had been first employed as an engineer by a multiple-mine coal company in Pennsylvania, and was night superintendent of a large coke oven plant.

He spent two years in Peru, employed by Cerro de Pasco Copper Corp. as an engineer and operating mine foreman. After Peru he received an assignment for mining investigations in Brazil by the United States Government under auspices of the (then) War Production Board and successor agencies, and later was employed by the U. S. Bureau of Mines and assigned as advisor to the Brazilian National Department of Mineral Production. After five years in Brazil on these assignments, Mr. Good acted as a private consultant to various foreign and American firms on investigations and reports on mining properties, and was retained by the U. S. Bureau of Mines on a consulting basis in connection with preparation of certain foreign mining industry reports and publications.

After joining Weirco, he spent eight years as Resident Chief Engineer of a Weirco team of engineers in Turkey acting as principal consultants to the Turkish Government on development of the Zonguldak Coal Basin. This project involved all phases of large-scale multiple mine development, from initial studies and recommendations through specifications, layout and general design, construction and putting plant and facilities into operation.

Since returning to home office base in 1958, in addition to administrative responsibilities on foreign projects, he has executed specific assignments on foreign and domestic projects involving investigations, feasibility studies, mine development planning and technical reports. Since 1958 his activities on foreign projects have included Mexico, Colombia, Indonesia, South Vietnam, Portugal and the Middle East.

Mr. Good is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers and the American Institute of Consulting Engineers. His honorary society memberships include Tau Beta Pi and Omicron Delta Kappa.

RAYMOND E. ZIMMERMAN
Vice President

Mr. Zimmerman received his B.S. in Mining Engineering and his E.M. degree from Pennsylvania State University. He is a Registered Professional Engineer. He joined Paul Weir Company in 1954.

His professional career includes extensive experience in coal preparation and utilization, mineral beneficiation, coal carbonization, testing, evaluation, specifications, cost projections, and direction of research. His experience also includes the operational aspects of plants and processing facilities.

Mr. Zimmerman was responsible for an exhaustive research of European coal preparation practices which has had significant influence on up-dating procedures in England, Holland, Belgium and Germany.

He is listed in *Who's Who in Engineering* and *American Men in Science and Education*. He is the co-author of the classic treatise *Coal Preparation* published by the American Institute of Mining Engineers which is now in its third edition. Many of his technical writings pertaining to coal preparation, processes and mineral preparation have been published in technical magazines and other publications.

His professional society memberships include the American Institute of Mining, Metallurgical and Petroleum Engineers; Illinois Mining Institute; Institution of Mining Engineers (U.K.); American Association for the Advancement of Science; National Society of Professional Engineers; and American Ordnance Association. His honorary society memberships include Sigma Gamma Epsilon (Mining), Sigma Xi (Research and Science), and Phi Lambda Upsilon (Chemistry and Physics).

Mr. Zimmerman's foreign assignments have included projects in Europe, Indonesia, Iran, Mexico, Peru, Japan and Turkey.

ERWIN GAMMETER

Vice President

Mr. Gammeter received his B.S. in Mining Engineering and his E.M. degree from Missouri School of Mines and Metallurgy.

He has been associated with the Paul Weir Company since 1945, with a leave of absence from 1952 to 1956 to serve the Hamilton Overseas Contracting Company in Turkey as Project Manager on a major tunnel-driving project on the coast of the Black Sea.

He brought a wealth of experience to his work at Weirco with a background as mining engineer for multiple-mine coal companies in Illinois, Kansas and Oklahoma.

His specialties are mine development and mine construction.

From 1958 to 1961 he served as Department Manager, Coal Mining, for a team of Paul Weir Company engineers and geologists in Korea, serving as Consultants to the Korean Government.

Mr. Gammeter is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; the Illinois Mining Institute; and Tau Beta Pi honorary society.

Foreign assignments on which he has been actively engaged include Brazil, Korea and Turkey.

DAVID J. KACHIK

Vice President

Mr. Kachik received his B.S. in Mining Engineering and his M.S. in Mining Geology from Pennsylvania State University.

He was a former Instructor in Mining and a Research Associate at Pennsylvania State University, and has been with Weirco since 1949. He is an expert in the fields of mine operation and production, mine management, and drilling programs with regard to underground operations. An area of particular interest to Mr. Kachik is the application of longwall mining methods.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; Illinois Mining Institute; and Coal Mining Institute of America.

Foreign assignments have taken him to England, South Africa and South Vietnam.

DONALD H. DOWLIN

Vice President

Mr. Dowlin received his Engineer of Mines degree from the Colorado School of Mines, and is a Registered Professional Engineer. He joined the Paul Weir Company in 1964.

Earlier in his career he was employed by various major coal companies, during which period he developed extensive experience in underground mining, being advanced into responsible positions in both the engineering and production fields. His experience included coal prospecting and evaluation of reserves, mine design and operation, plant layout and design, property evaluations and mine management.

Immediately prior to his employment with the Paul Weir Company he was employed by a nationally-known engineering and consulting firm working in the engineering, design and construction of coal mining installations. At this time he served as a Project Engineer with responsibilities from initial planning to final operation. During this employment he also represented his firm as coal consultant to a major steel company in India.

His further experience and assignments with the Paul Weir Company have been in the same areas of engineering and professional activities as those previously discussed.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the Illinois Mining Institute.

GEORGE W. BOULTER

Mr. Boulter received his B.S. in Mining Engineering from Montana School of Mines, and is a Registered Professional Engineer.

His specialty is strip, open-pit and quarry mining, with world-wide experience on projects of major scope.

Earlier in his career he was employed as Mining Engineer and Mine Superintendent by major metal mining companies in western United States and later as Mining Engineer and Project Manager by a major western railway company. At the time he joined Weirco in the early part of 1968, he was Manager, Mining Division for a major manufacturer of heavy earth-moving equipment.

As an authority on open-pit or surface mining, Mr. Boulter has extensive experience with operations of this type under a wide variety of conditions and a broad spectrum of equipment applications. In addition to familiarity with most of the open-pit operations of size on the North American continent, he has carried out assignments on many projects abroad, in areas including Australia, Africa, the Middle East, Tasmania, New Zealand, Surinam, Guyana, New Guinea, India, Brazil, Sweden, United Kingdom and West Germany.

He has contributed articles connected with his specialty to various technical publications and is the author of the chapter on Cyclical Methods—Draglines in the Seely W. Mudd series authoritative book on surface mining. He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; Illinois Mining Institute; and Northwest Mining Association.

GERALD C. CLARK

Mr. Clark received B.S. and M.S. degrees in Mining Engineering from West Virginia University. He is a Registered Professional Engineer.

He joined Paul Weir Company in 1965. Prior to that time he had been Chief Engineer for a coal company and was employed by the American Mining Congress as Mechanization Engineer at the time he came to Weirco.

His experience with operational problems, underground mining methods and equipment applications under a variety of conditions, and the economic aspects of mine development and operation provides the basis for his demonstrated capabilities and contributions to many of Weirco's most demanding projects.

He has contributed various articles to technical publications, and is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; the West Virginia Society of Professional Engineers; and the Illinois Mining Institute. He is also a member of Sigma Gamma Epsilon, honorary earth's science society.

MARTIAL P. CORRIVEAU

Martial Corriveau received his B.S. degree in Metallurgical Engineering from Michigan College of Mining and Technology, and his S.M. in Metallurgy from Massachusetts Institute of Technology. He also received a Professional Engineering degree of Metallurgical Engineer from Michigan College of Mining and Technology. He is a Registered Professional Engineer. He joined Paul Weir Company in 1968.

Mr. Corriveau's experience is extensive in the fields of mineral dressing and processing, coal and coke analysis and testing, preparation and quality control, and research. He has been employed as a metallurgist with U. S. Smelting, Refining and Mining Company; as a Research Engineer with Battelle Memorial Institute; as Research Assistant at Massachusetts Institute of Technology; and as Associate Research Professor at Virginia Polytechnic Institute.

He held the position of Preparation Engineer and Manager of Quality Control with a multiple-mine coal producing company, and prior to joining Weirco he was Technical Advisor and Director, Commercial Testing and Engineering Co., responsible for all company-wide technical aspects of analysis and testing of coal, coke and ore minerals, and establishment of a new Air and Water Pollution Department.

Mr. Corriveau is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers. He is a member of the Coal Preparation Committee, American Mining Congress and the American Society for Testing Materials (ASTM) Committee on Coal and Coke. His honorary society memberships include Tau Beta Pi and Sigma Xi.

RICHARD W. STOREY

Mr. Storey received his B.S. in Civil Engineering from the University of Kentucky. He is a Registered Professional Engineer (Mining and Civil). He joined Paul Weir Company in 1967.

During his career, he has held responsible positions in the U.S.A. with substantial coal mining firms as Mining Engineer, Division Engineer and Chief Engineer. Prior to joining Weirco he was employed on overseas assignment as Mining Engineer and advisor to the Korean coal industry on problems including exploration, development, operation, and processing and utilization.

His assignments with Paul Weir Company have been focused in the areas of feasibility studies, planning and design, mine operation problems and development of mining properties.

He has contributed articles to technical journals on underground auger mining and continuous mining in eastern Kentucky coal fields. He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the Illinois Mining Institute.

JAMES E. McNULTY, JR.

Mr. McNulty received his B.S. in Geology from the University of Iowa. He joined Paul Weir Company in 1961.

He is a mining geologist and has had intensive field and office experience in exploration and supervision of drilling and sampling programs, interpretation of exploration, drilling and analytical data, mapping, evaluation of underground mining conditions, and establishment of reserves.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the Illinois Mining Institute.

WILLIAM A. SMITH

Mr. Smith received his B.S. degree in Mining Engineering from the Royal College of Science and Technology (Glasgow). He is a Chartered Engineer (U.K.).

He joined Paul Weir Company in 1966. His areas of special capabilities are shaft sinking and underground development work.

Mr. Smith has had extensive experience throughout Great Britain where he served as Project Manager for Cementation Company Ltd. His work also took him to India on major shaft sinking and mine development projects. Prior to joining Weirco he had been assigned to U.S.A. as Area Manager in charge of shaft sinking projects for Cementation Company.

He is an Associate Member of the Institute of Mining Engineers (U.K.); a member of the National Association of Colliery Managers; the American Institute of Mining, Metallurgical and Petroleum Engineers; and the Illinois Mining Institute.

JOHN S. SNYDER

Comptroller

Mr. Snyder received his M.B.A. from the University of Chicago. He has been with Paul Weir Company since 1952.

Prior to joining Weirco, his experience included positions as District Controller for a multi-company engineering and heavy equipment manufacturing corporation and Comptroller for an electronic components manufacturing firm. He has had administrative responsibilities in mining operations.

His responsibilities with Weirco encompass all financial aspects of the organization including those connected with overseas operations. Purchasing, office personnel and office administration are under his supervision.

On projects involving economic and financial analyses and projections, Mr. Snyder's services are employed on behalf of clients as well as on Weirco's internal affairs.

He is a member of the Illinois Mining Institute.

JOHN L. DOBELBOWER

Mr. Dobelbower is a Mechanical Engineer, receiving his B.S. degree from Pennsylvania State University. He joined Paul Weir Company in 1964.

Prior to joining Weirco he had 14 years experience with a prominent company in the cement, lime and construction aggregate industry. Advancing from Mine and Plant Engineer, he held increasingly responsible positions as Project Manager, Budget Director and Manager of Operations in various divisions of the company. His experience included all phases of engineering, production, planning, operations and management. He has had direct experience on both engineering and operational levels with a wide variety of equipment used in underground and surface mining operations.

Mr. Dobelbower's experience and capabilities earned him an assignment as Project Manager of a team of Weirco engineers resident in Turkey as engineering consultants to the Turkish Government on a large scale expansion phase of the public sector coal mining activities. In addition to the supervisory responsibilities of a Project Manager, his work since joining Weirco has centered around planning, budgeting, and problems related to the engineering and application of equipment for mining and mining facilities.

HENRY D. OLSON

Mr. Olson is an Electrical Engineer, with a B.S. degree from the University of Minnesota. He joined Paul Weir Company in 1967.

Prior to his employment by Weirco, he had first served as a Field Service Engineer with the Electro-Motive Division of General Motors Corporation.

Later employed by Western Knapp Engineering Division of Arthur G. McKee and Company, he served as Electrical Design Engineer, provided field engineering services during construction and start-up phases of large industrial plants and facilities, and was Project Electrical Engineer on a multi-million dollar plant expansion.

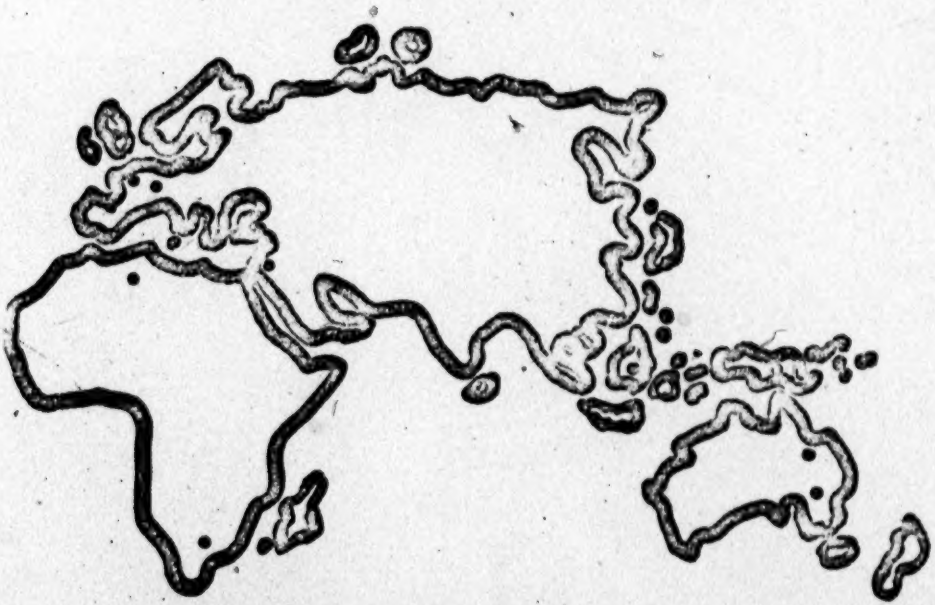
Mr. Olson served with Jones and Laughlin Steel Corp. as Chief Electrician, New York Ore Division, engaged in the mining and beneficiation of iron ore. In charge of a staff of 27 electricians and their supervisors, he was responsible for all electrical design and construction, and the maintenance of all electrical equipment used in the mining operations. This included incoming 115KV lines through to the AC and DC machinery.

Upon joining Weirco, Mr. Olson was assigned to a major project in Turkey as Electrical Engineer on a Weirco team providing engineering services to the Turkish Government on a large scale mining expansion program. His activities with Weirco have continued to center around the engineering and technical problems related to electrical equipment, systems and facilities used in the mining industry.

He is a member of the Institute of Electrical and Electronic Engineers.

★ Home Office
20 North Wacker Drive
Chicago, Illinois 60606
U.S.A.

DOMESTIC AND OVERSEAS OPERATIONS



- Canada
- Mexico
- Brazil
- Colombia
- Chile
- Middle East
- Indonesia
- South Vietnam
- South Korea
- Philippines
- Australia
- Great Britain
- Portugal
- Turkey
- Germany
- France
- South Africa
- North Africa

1876

72-402

No.

FILED
SEP 8 1972
MICHAEL RODAK, JR., CLERK

In the Supreme Court of the United States

OCTOBER TERM, 1972

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT

ERWIN N. GRISWOLD,
Solicitor General,

THOMAS E. KAUPER,
Assistant Attorney General,

ALLAN A. TUTTLE,
Assistant to the Solicitor General,

CARL D. LAWSON,
RONALD L. FUTTERMAN,
Attorneys,
Department of Justice,
Washington, D.C. 20530.

INDEX

	Page
Opinion below	1
Jurisdiction	1
Questions presented	2
Statute involved	3
Statement	3
A. The coal industry	4
B. The acquiring company—General Dynamics, Material Services, and Freeman	6
C. The acquisition and the acquired company (UEC)	7
D. Proceedings below	9
The questions are substantial	11
Conclusion	25
Appendix A	1a
Appendix B	67a

CITATIONS

Cases:

Brown Shoe Co. v. *United States*, 370 U.S. 294	12, 13, 18
Federal Trade Commission v. *Consolidated Foods Corp.*, 380 U.S. 592	21
Federal Trade Commission v. *Procter & Gamble Co.*, 386 U.S. 568	22
Reynolds Metals Co. v. *Federal Trade Commission*, 309 F. 2d 223	15
United States v. *Continental Can Co.*, 378 U.S. 441	14, 15, 19, 22

Cases—Continued Page

United States v. *du Pont Co.*, 353 U.S. 586 ..... 21, 22
United States v. *El Paso Natural Gas Corp.*, 376 U.S. 651 ..... 2, 11
United States v. *Pabst Brewing Co.*, 384 U.S. 546 ..... 18, 19, 20
United States v. *Penn-Olin Chemical Co.*, 378 U.S. 158 22
United States v. *Philadelphia National Bank*, 374 U.S. 321 ..... 17, 18, 20
United States v. *Von's Grocery Co.*, 384 U.S. 270 ..... 19, 20
Utah Commission v. *El Paso Natural Gas Co.*, 395 U.S. 464 24

Statute:

Clayton Act, § 7, 38 Stat. 731, as amended, 64 Stat. 1125, 15 U.S.C. 18 ..... 2, 3, 9, 12, 13, 14, 16, 20, 21

Miscellaneous:

Fortune Magazine, May 15, 1969 6

In the Supreme Court of the United States

OCTOBER TERM, 1972

No.

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT

Filed 9/8/72

OPINION BELOW

The opinion of the district court (App. A, *infra*, 1a-66a) is reported at 341 F. Supp. 534.

JURISDICTION

The opinion and judgment of the district court was filed on April 13, 1972. The notice of appeal to this Court (App. B, *infra*, 67a-68a) was filed on

June 7, 1972. On July 7, 1972, Mr. Justice Rehnquist extended the time for docketing an appeal until September 8, 1972. The jurisdiction of this Court is conferred by Section 2 of the Expediting Act (15 U.S.C. 29). *United States* v. *El Paso Natural Gas Corp.*, 376 U.S. 651.

QUESTIONS PRESENTED

1. Whether, under Section 7 of the Clayton Act, coal is a relevant line of commerce for the purpose of assessing the competitive effects of the combination of the second and fifth largest coal producers in Illinois, and the second and sixth largest in the Eastern Interior Coal Province Sales Area.

2. Whether Illinois and the Eastern Interior Coal Province Sales Area are relevant sections of the country for purposes of assessing the competitive effects of such a combination.

3. Whether, in assessing anticompetitive effects under Section 7 of the Clayton Act, it is proper for a court to consider only whether at the time of trial the acquired firm could still survive as an independent entity, without determining the competitive potential of that firm that was cut off by the acquisition.

4. Whether the trial court committed clear error in finding that the acquired company would not be able economically to mine its uncommitted strip coal reserves, could not develop the expertise to mine its own deep coal reserves, and could not acquire and develop further coal reserves.

STATUTE INVOLVED

Section 7 of the Clayton Act, 38 Stat. 731, as amended, 64 Stat. 1125, 15 U.S.C. 18, provides in pertinent part:

> No corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital and no corporation subject to the jurisdiction of the Federal Trade Commission shall acquire the whole or any part of the assets of another corporation engaged also in commerce, where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly.
>
> * * * * *

STATEMENT

The United States instituted this civil antitrust case, contending that the acquisition of the stock of United Electric Coal Companies ("UEC") by Material Service Corporation ("Material Service") and its successor, General Dynamics Corporation ("General Dynamics), violated Section 7 of the Clayton Act (15 U.S.C. 18). It alleged that actual and potential competition in the Illinois and Eastern Interior Coal Province Sales Area coal markets might be substantially lessened by the acquisition. After a trial on the merits, the district court held there was no Section 7 violation.

A. The Coal Industry

The coal industry has undergone a substantial transformation in the postwar period. It lost the railroad market entirely to the diesel engine. It lost most of the home heating, and a substantial portion of the industrial, market to gas and oil (App. 11a-12a). Total coal production in the United States dropped from 441 million tons in 1947 to 278 million tons in 1954 (DX 85, Table I).[1] Since 1954 the electric utility market has become the principal mainstay of the coal industry, and by 1968 it accounted for 72 percent of total national coal consumption (DX 85, Table I). The utilities' rapidly increasing energy demands have led to a resurgence of coal production since 1954. By 1968 the United States produced 408 million tons of coal (DX 85, Table I), a production figure which is estimated to be increasing at the rate of 3.1 percent per year through 1980 (GX 232, p. 41).

Coal resources are concentrated in four distinct regions of the United States. The region whose sales area the government claimed constituted one of the "section[s] of the country" (15 U.S.C. 18) in which competition was affected by the acquisition is the Eastern Interior Coal Province, which encompasses

---

[1] "DX" references are to defendants' exhibits in the district court; "GX" references are to government exhibits in the district court; "Tr." references are to the transcript of proceedings in the district court. "—— Dep." refers to depositions taken before trial. "DPF" refers to the defendants' proposed findings of fact in the district court.

the central and southern two-thirds of Illinois and much of southwestern Indiana and western Kentucky.[2] All of the mines of the acquired and acquiring companies are now located in Illinois within the Eastern Interior Coal Province.

The leading producers have accounted for an ever-increasing share of the total production in the Eastern Interior Coal Province. In the 10 years between 1957 and 1967 the top two firms increased their share of the region's total production from 29.6 percent to 48.6 percent, the top four increased their share from 43.0 percent to 62.9 percent, and the top ten increased their share from 65.5 percent to 91.4 percent (GX 86). During the same period, in the State of Illinois, the top two producers increased their share of total Illinois production from 35.5 percent to 52.9 percent, the top four increased their share from 52.2 percent to 75.2 percent, and the top ten increased their share from 81.6 percent to 98.0 percent (GX 73). This period was also marked by a sharp decline in the number of producers. A total of 145 companies were producing coal in Illinois in 1957; only 39 companies remained in 1967 (GX 73).

---

[2] The other three are: (1) The Eastern Coal Province of western Pennsylvania, West Virginia, eastern Kentucky and parts of Ohio, Tennessee and Alabama; (2) The Western Interior Coal Province, comprised of central Iowa, northern and western Missouri and eastern Oklahoma; and (3) scattered deposits in Montana, Wyoming, Colorado and Utah (GX Kurtz Dep. Ex. 10, p. 47).

B. The Acquiring Company—General Dynamics, Material Services, and Freeman

General Dynamics[3] became the nation's fifth largest coal miner as a result of its acquisition of Material Service in 1959 (App. 3a). Material Service was then engaged in producing and supplying building materials, concrete, coal and limestone. It then owned all of the stock of Freeman Coal Mining Corporation (App. 3a).

In 1959 Freeman produced approximately 6.9 million tons of coal at mines located in Illinois (GX 64) and accounted for 15.1 percent of Illinois production (GX 64) and 7.6 percent of Eastern Interior Coal Province production (GX 77). It was the second largest producer in both areas (GX 64, 77). In 1967[4] it produced 8.4 million tons and accounted for 12.9 percent of Illinois production (GX 72) and 6.5 percent of Eastern Interior Coal Province production (GX 85).

Freeman sold 51.4 percent of its 1965 production (GX 88), 44.0 percent of its 1966 production (GX 89) and 42.3 percent of its 1967 production (GX 90) to customers who also purchased coal from UEC, the acquired Company. These customers consumed

---

[3] General Dynamics is a large and diversified company that depends on government sales for more than 85 percent of its business (App. 2a). It ranked 27th among industrial corporations in the United States in 1968, with total sales of $2,662,238,000. (*Fortune Magazine*, May 15, 1969, p. 168.)

[4] UEC became a wholly owned subsidiary of General Dynamics at the beginning of 1967 (App. 9a).

37.4 percent of Freeman's 1965 output, 37.0 percent of its 1966 output and 39.8 percent of its 1967 output at facilities which also consumed substantial portions of UEC's output in those years (see GX 91 and *infra*, p. 8).

At the time of trial in 1970 Freeman operated four mines in southern Illinois and one mine in central Illinois (DPF 59, 60). All of the Freeman mines were deep mines (App. 6a). Freeman also owned the rights to approximately 484 million tons of deep coal reserves in Illinois (DPF 59).

C. The Acquisition and the Acquired Company (UEC)

Material Service began acquiring UEC stock in 1954 and had increased its holdings to 34 percent by 1959 when Freeman's president, Frank Nugent, was elected Chairman of UEC's Executive Committee (App. 7a-8a). General Dynamics acquired Material Service a few months later and continued to acquire UEC stock. In September 1966 General Dynamics held 66.15 percent of UEC's stock and made a successful tender offer for the remaining shares (App. 8a-9a).

In 1959 UEC produced 3.7 million tons of coal in Illinois (GX 64) and .6 million tons in other parts of the Eastern Interior Coal Province (GX 77) and accounted for 8.1 percent of the Illinois production (GX 64) and 4.8 percent of the Province's production (GX 77). It was the fifth largest producer in Illinois and the sixth largest in the Province. In 1967 it produced 5.7 million tons and accounted for

8.9 percent of Illinois production (GX 72) and 4.4 percent of the Province's production (GX 85).

UEC sold 70.2 percent of its 1965 production (GX 88), 62.1 percent of its 1966 production (GX 89) and 61.6 percent of its 1967 production (GX 90) to customers who also purchased coal from Freeman. These customers consumed 54.7 percent of UEC's 1965 output, 52.9 percent of its 1966 output and 48.2 percent of its 1967 output at facilities which also consumed substantial portions of Freeman's output in those years (see GX 91 and *supra*, p. 7).

At the time of the trial UEC operated three mines in west central Illinois and one mine in southern Illinois (App. 6a). All of the UEC mines were open pit or strip mines (*ibid.*). It has not operated an underground mine since 1954 (App. 7a). In 1970 UEC owned 52 million tons of strip reserves in its existing mines (App. 9a). It also owned 12.6 million tons of strip reserves in the Industry Field in central Illinois and 44.3 million tons of deep reserves in the Round Prairie Field in southern Illinois (DX 60A), and it controlled another 40 or 50 million tons by location in the Round Prairie Field (Tr. 314-318).[5]

UEC has consistently had one of the highest profit

---

[5] Reserves contiguous to those owned, leased or optioned are "controlled by location" if, in order to be mined at all, they must be mined by the holder of the rest of the reserves in the area.

margins in the coal industry.* In 1959 UEC had a net worth of $19.6 million, $2.8 million in working capital and a long-term debt of $1.2 million (GX 24). By 1968, despite the payment of $11 million in dividends to General Dynamics (GX Nugent Dep. Ex. 22, GX 27), UEC had eliminated all long-term debt, had increased its net worth to $26.9 million, and had accumulated $10.7 million in working capital (GX 34).

D. Proceedings Below

The United States filed its complaint on September 22, 1967. The trial was held from March 30 to April 22, 1970, and the district court issued its opinion on April 13, 1972.

The government's theory of the case was that the Freeman-UEC combination was an ordinary horizontal acquisition which created an entity claiming an inordinate share of an increasingly concentrated market. The government contended that coal is an appropriate line of commerce for Section 7 purposes, that Illinois and the Eastern Interior Coal Province Sales Area are appropriate sections of the country,

---

* It was the industry leader in operating income as a percentage of revenues in 9 out of 11 years from 1955 through 1965 in a Standard & Poor's survey of 13 major coal companies (GX 26, p. C76). During the period from 1959 through 1967, UEC realized profits of $24.1 million on sales of $181.2 million (see GX 25). Freeman realized profits of $15.8 million on sales of $289.9 million during the same period (GX Nugent Dep. Exs. 1-9).

and that the combination was likely to produce substantial anticompetitive effects within the relevant markets.[7]

Defendants attempted to show that Freeman and UEC were not actual or potential competitors. To this end, defendants divided the companies' sales into ten geographic areas, based largely on Freight Rate Districts. They contended that Freeman and UEC do not compete in eight of these markets and will not compete in the future in the other two. In addition they claimed that UEC was not a potential competitive force because it could not mine its own uncommitted strip mine or deep reserves, and could not acquire and develop other reserves.

The district court rejected the government's proposed product and geographic markets. It held, after a lengthy discussion of interfuel competition in the electric utility market, that "the energy market is the appropriate line of commerce for testing the competitive effect of the United Electric-Freeman combination" (App. 53a). It adopted ten geographic markets proposed by the defendants, consisting of the Commonwealth Edison Company, the Metropolitan Chicago Interstate Air Quality Control Region and utility and non-utility sales areas for coal mines

---

[7] The Eastern Interior Coal Province Sales Area is comprised of Illinois, Indiana, the western half of Kentucky, the western one-third to one-half of Tennessee, the extreme eastern portion of Missouri on or near the Mississippi River, the eastern half of Iowa, southeastern Minnesota, and southern Wisconsin.

located in each of four different Freight Rate Districts (App. 56a-59a).[8]

In addition the district court stated that even if it were to accept the government's geographic markets, the government's "failure to show that a substantial lessening of competition resulted from the United Electric-Freeman combination is fatal to this divestiture action" (App. 59a-60a). The district court's conclusion of a lack of anticompetitive effect rested on subsidiary findings (a) that UEC's reserves of coal for strip mining were small and the government had not shown that it could acquire additional economically mineable strip reserves (App. 63a), (b) that UEC did not have and could not acquire the skill to mine its own expansive deep reserves (App. 65a), and (c) that UEC and Freeman are "predominantly complementary in nature" (App. 61a) because of their different mining techniques, because Freeman produces some dust and metallurgical coal while UEC does not, and because Freeman produces some coal that has a lower sulphur content than the UEC coal (App. 61a-62a).

THE QUESTIONS ARE SUBSTANTIAL

This appeal raises substantial questions concerning the proper criteria for the analysis of product

---

[8] Parts II and III of the district court's opinion (App. 11a-53a), which contain all of the factual findings underlying the court's product and geographic market definitions, consist *verbatim* of Defendants' Proposed Findings of Fact Nos. 138-282 (omitting Nos. 209-210; 217-218; 234-235; 241; 250; 253; 280-281). Compare *United States* v. *El Paso Gas Co.*, 376 U.S. 651, 656-657.

and geographic markets, and the proper standards for assessing the anticompetitive effects, in Section 7 cases. In rejecting coal as a relevant product market, the district court departed from the consistent teachings of this Court that there may be more than a single "line of commerce" relevant for Section 7 purposes. In addition, the district court adopted, as the relevant geographic markets, a patchwork of small "markets" based on the sales area for the freight rate district in which each of the defendants' mines was located, despite the fact that the mines sold more than half of their production outside of those "markets." Finally, the court improperly assessed the competitive potential of UEC, the acquired company, by looking at the state of the company's resources and prospects at the time of trial in 1970 rather than at the time of acquisition in 1959. And, even in making this determination, the trial court committed clear error in finding that UEC would not be able economically to mine its uncommitted strip reserves, could not develop the expertise to mine its own deep reserves, and could not acquire and develop any others.

1. Whether or not the trial court was correct in finding the "energy market" (App. 53a) to be a "line of commerce," it erred in rejecting coal as a relevant submarket. As this Court clearly explained in *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 325:

> The outer boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between

> the product itself and substitutes for it. However, within this broad market, well-defined submarkets may exist which, in themselves, constitute product markets for antitrust purposes. * * * The boundaries of such a submarket may be determined by examining such practical indicia as industry or public recognition of the submarket as a separate economic entity, the products' peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors. * * *

Brown Shoe thus recognizes that, on the one hand, defining a Section 7 "line of commerce" only to include all substitutes may frustrate the congressional purpose by obscuring the effect of a merger between sellers of any one of the substitutable products; while, on the other hand, defining it only in terms of a single product may equally frustrate the congressional purpose by excusing mergers between sellers of substitutes. In view of the expressed congressional desire to prevent mergers which may substantially lessen competition in *any* line of commerce, the Court concluded that the effects of a merger must be examined not only in the broader product market, but also "in each such economically significant submarket * * *" (*ibid.*).

The record demonstrates that coal satisfies all the "practical indicia" of a submarket set forth in *Brown Shoe*. It is classified as a separate industry by the Office of Budget and Management (GX 29, p. 612), and the industry has its own trade associations, labor

unions and trade publications (Kolbe Dep. 168-169). Coal is produced, processed, and distributed by means, methods and facilities that differ from the means, methods and facilities used for other fuels (Tr. 1388-1389, DX 150, DX 116, pp. 75-89). And the major coal deposits are also located in different areas from the principal locations of other fuels (DX 150, p. 55). Coal is sold at a delivered price per BTU which is considerably lower than that for any other fuel except interruptible natural gas, which is available only on a seasonal basis (GX 35, GX 36, GX 37). Coal's price advantage makes it the primary fuel source for consumers such as electrical utilities whose fuel costs represent a significant part of their cost of doing business. Coal contributed 90 to 93 percent of the BTU's of heat consumed by steam electric utility plants in the Eastern Interior Coal Province Sales Area in each of the years 1960 through 1967 (GX 31) and 74.1 percent of the BTU's consumed by cement plants in that area during 1967 (GX 32).

The district court's failure to recognize coal as a relevant line of commerce stemmed from its misunderstanding of this Court's decision in *United States* v. *Continental Can Co.*, 378 U.S. 441. While the Court there did hold that evidence of competition between glass and metal containers indicates the existence of a "line of commerce" encompassing both, it by no means held that they together constituted the only "line of commerce" relevant for Section 7 purposes. On the contrary, the Court specifically recognized that each might constitute a separate line of

commerce: "Glass and metal containers were recognized to be two separate lines of commerce. But given the areas of effective competition between these two lines, there is necessarily implied one or more other lines of commerce embracing both industries" (378 U.S. at 456-457). Moreover, *Continental Can's* holding itself evidences the continuing vitality of the submarket concept, since the decisive line of commerce there was recognized to be a subdivision of a broader "container" market. 378 U.S. at 457-458.*

2. Having rejected coal, and opted for the "energy market" as the exclusively relevant product market, the trial court proceeded to adopt a patchwork of geographic markets, which, far from being defined by the marketing of "energy," were defined by alleged distribution patterns of various subspecies of coal.

The defendants proposed ten geographic markets, which the court adopted out of context. The defendants' proposed markets were not designed to illustrate how "energy" is distributed in the midwest, or even primarily to show how coal is distributed, but rather to attempt to prove that Freeman and UEC did not compete. Quite apart from the failure of defendants' markets to explain away the fact that UEC and Freeman sold about half of their produc-

---

* See also *Reynolds Metals Co.* v *Federal Trade Commission*, 309 F.2d 223 (C.A. D.C.), in which the court of appeals stated, in analyzing the *Brown Shoe* decision, that distinct submarkets "may henceforth be the focal point of administrative and judicial inquiry under Section 7." *Id.* at 226.

tion to the same facilities of the same customers, they were not geographic coal markets.

Defendants' proposed geographic markets were based on the utility and non-utility sales areas for the four Freight Rate Districts in which Freeman's and UEC's mines were located at the time of trial.[10] Defendants purported to show that there was no competitive overlap between the sales areas of the districts in which Freeman's mines were located and of those in which UEC's mines were located. In order to reach this result, it was necessary for defendants to exclude all sales to Chicago, all sales to Commonwealth Edison and all sales of coal dust. This resulted in the exclusion of more than half of the production from these Freight Rate Districts—26.3 million tons out of 50.3 million tons (DX 55).

Defendants attempted to justify these enormous exclusions on the basis of differences in product. They contended that Commonwealth Edison[11] and Chicago sales can be disregarded because these customers will not in the future be buying coal from the Freight Rate Districts in which UEC's mines are located[12]

---

[10] UEC's mines were located in the Fulton-Peoria and Belleville Freight Rate Districts; Freeman's mines were located in the Springfield and Southern Illinois districts.

[11] Thus, by accepting the defendants' markets for a purpose for which they were not intended, the district court has concluded that the Commonwealth Edison Company is a "section of the country" for Section 7 purposes.

[12] Defendants also contended that Commonwealth Edison should be segregated because of its unique consumption patterns and its commitment to nuclear energy (see App. 58a).

because the coal there has a high sulphur content,[13] and they contended further that dust sales can be disregarded because coal dust and coal screenings are not competitive products.

These contentions are refuted by the record. Commonwealth Edison must continue to use coal of high sulphur content to meet its great fuel needs (see Tr. 1996); the record shows Chicago customers can comply with air pollution regulations by mixing low sulphur coal with high sulphur coal (Stanley Dep. 24-25); and many utilities have facilities capable of substituting regular coal screenings for coal dust.[14]

By contrast, the government's proposed markets were designed to identify an economically significant area in which the effects of the merger will be felt. *United States* v. *Philadelphia National Bank*, 374 U.S. 321, 357. Approximately 82 percent of the coal produced in the Eastern Interior Coal Province was sold in the Eastern Interior Coal Province Sales Area in 1967 (GX 52) and more than 99 percent of the coal consumed by electric utilities in the area was produced in Eastern Interior Coal Province mines (GX 61). In the same year Freeman and UEC

---

[13] Thus, in adopting "energy" as the product market while adopting these narrow geographic markets, the district court held that, while various other forms of energy compete with coal, different kinds of coal do not compete with each other.

[14] The district court itself recognized the competition of coal dust and coal screenings. It noted that "special equipment for the handling and burning of dust has been developed and installed at certain generating facilities which permits the use by them of limited amounts of dust along with regular coal screenings as boiler fuels" (App. 6a, n.6).

sold 93.3 percent and 97.6 percent, respectively, of their production in this area (GX 52). Illinois is also a relevant market. In 1967 Illinois coal customers purchased 82 percent of their requirements from Illinois mines (GX 51). See *United States* v. *Pabst Brewing Company*, 384 U.S. 546, 549.

3. A horizontal merger is particularly likely to result in a substantial lessening of competition because it produces a direct and immediate increase in the level of concentration in a market. This Court, accordingly, has consistently measured a challenged horizontal combination's effect upon market structure and has attached primary importance to that factor. The Court stated in *Brown Shoe Co., supra*, that statistics "reflecting the shares of the market controlled by the industry leaders and the parties to the merger are, of course, the primary index of market power * * *." 370 U.S. at 322, n. 38. In *United States* v. *Philadelphia National Bank, supra*, the Court concluded that in some circumstances the market shares of the merging parties is more than a "primary index" of market power and the combined market share alone may demonstrate that a merger "is so inherently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects." 374 U.S. at 363. The Court declined to specify the minimum combined market share which will establish *prima facie* illegality, but concluded that the merging banks' combined share in excess of 30 percent was clearly

sufficient. In *United States* v. *Continental Can Co.*, *supra*, the Court reversed a dismissal at the end of the government's case where the combined firms accounted for 25 percent of the appropriate market.

The Court concluded in *United States* v. *Von's Grocery Co.*, 384 U.S. 270, and *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, that mergers involving considerably smaller combined market shares are likely to result in a substantial lessening of competition if the merger occurs in a market which has experienced a rapid increase in the level of concentration. In *Von's Grocery*, the Court noted that the merger involved the combination of the third and sixth largest firms in the Los Angeles area to form the second largest firm with a combined market share of 7.5 percent, further noted that there had been a rapid increase in the level of concentration, and declared that "[t]hese facts alone are enough to cause us to conclude contrary to the District Court that the Von's-Shopping Bag merger did violate Section 7." 384 U.S. at 274. Mr. Justice White's concurring opinion in *Von's Grocery* emphasized that the degree of concentration within the market as measured by the market shares held by the leading companies must also be considered. 384 U.S. at 281. In *Pabst*, the merging firms accounted for 4.49 percent, 11.32 percent and 23.95 percent of the three proposed markets. The Court found on the basis of these market shares and the trend toward concentration that *prima facie* illegality had been established in all three markets. 384 U.S. at 551-552.

In view of the pronounced trend toward concentration in the Illinois and Eastern Interior Coal Province Sales Area markets and the leading position of the combined firms in those markets (*supra*, pp. 5-8), the Freeman-UEC combined shares in those markets—23.2 percent in Illinois and 12.4 percent in the Province in 1959 (*supra*, pp. 6, 7)—was clearly sufficient to require (in the absence evidence clearly showing the contrary) the conclusion that the combination "may * * * substantially * * * lessen competition * * *" (15 U.S.C. 18).

4. Notwithstanding this showing, the trial court held that "the Government's failure to show that a substantial lessening of competition resulted from the United Electric-Freeman combination is fatal to this divestiture action" (App. 60a). In reaching this conclusion the court committed at least two errors.[15] The court erred, as a matter of law, in assessing the competitive potential of an independent UEC, by looking at its actual and potential resources only as they stood after 11 years of control by its competitor, *i.e.*, by looking into whether, at the time of trial, it could survive, if divested. And, in any event, the

---

[15] The quoted language also raises the possibility that the court believed that the government's structural evidence did not even establish a *prima facie* case. This would clearly be error under *Philadelphia Bank, Von's Grocery Co.* and *Pabst Brewing Co., supra.* However, since the court rendered it's opinion after the close of trial, it cannot be said with certainty whether the court was speaking of the government's burden or of its view of all the evidence introduced by both sides. Our argument assumes the latter.

court erred in concluding that UEC is not now a potentially viable independent competitor.

Stating that "[t]he adequacy of crucial resources" is essential to a competitor (App. 63a), the court held: "The Government failed to come forward with any evidence that such reserves are *presently* available" (App. 63a) (emphasis in original). Similarly, the court ruled: "United Electric *has* neither the possibility of acquiring more nor the ability to develop [its own] deep coal reserves" (App. 65a) (emphasis added). Conversely, the court made no assessment of what UEC might have been able to do, had it remained independent in, and after, 1959.

This was legal error. It is true that Section 7 requires the court to consider, from the vantage point of the time of suit, whether the acquisition may substantially lessen competition (*United States* v. *duPont & Co.*, 353 U.S. 586, 596-598, 607), and that in some circumstances post-acquisition evidence may show that "the acquisition threatens to ripen into a prohibited effect" (*id.* at 597). But it is equally fundamental that Section 7 deals in potentialities, and that post-acquisition behavior must not be permitted to obscure the real competitive potentialities cut off by the acquisition. As the Court explained in *Federal Trade Commission* v. *Consolidated Foods Corp.*, 380 U.S. 592, 598:

> [T]he force of § 7 is still in probabilities, not in what later transpired. That must necessarily be the case, for once the two companies are united no one knows what the fate of the acquired

company and its competitors would have been but for the merger.

Consequently, the Court held, post-acquisition evidence is not to be "given conclusive weight or allowed to override all probabilities * * *" (*ibid.*).[16] It follows that the district court erred in the present case by assessing the relevant competitive effects solely on the basis of whether the acquired firm could survive *at the time of trial* as a competitive entity, without also (and more significantly) determining the competitive potential cut off by the acquisition.

But even assuming that it was proper for the court to consider UEC only as it was at the time of trial, the court clearly erred in finding that UEC could not then acquire the expertise to mine its deep reserves and would not be able economically to mine its uncommitted strip reserves. UEC began acquiring deep reserves in the Round Prairie Field in 1958 (Tr. 170-171, Dorrance Dep. 27), the year before Material Service assumed control of UEC. Defendants' coal reserves expert testified that coal companies do not acquire coal reserves unless they intend to mine them (Organ Dep. 151). This was not an unrealistic expectation. Humble Oil made a *de novo* entry into deep mining in Illinois after 1964. It constructed a deep mine at a cost of between $10 million and $20 million (excluding the

[16] See, also, *United States* v. *Continental Can Co., supra*, 378 U.S. at 463; *United States* v. *Penn-Olin Chemical Co.*, 378 U.S. 158, 170, 177; *Federal Trade Commission* v. *Procter & Gamble Co.*, 386 U.S. 568, 577.

cost of reserves), which is expected to produce 3,000,000 tons per year for 20 to 30 years, and it has contracted to sell coal to Illinois utilities (Stipulated Testimony of George H. Shipley). Ayrshire Collieries Coal Company also developed a deep mine after many years of operating exclusively as a strip mining company (Tr. 1867-1871).

A former UEC president with deep mining experience testified that, as of 1969, a deep mine with annual capacity of one million tons of production could be constructed at Round Prairie at a cost of 7 to 8 million dollars (Camicia Dep. 32-33, 193-194). A company with $10.7 million in working capital, a net worth of $26.9 million and *no* long-term debt obviously could obtain the funds to undertake such an investment and to hire the experts it might need. Accordingly, the court's apparent finding that an independent UEC would not be capable of entering deep mining and continuing as a major competitor in the relevant coal market is clearly erroneous on this record.

The district court's similar finding (App. 63a) that existing strip reserves, including the UEC reserves at Industry Field, will not become economically feasible to mine before the present UEC mines are exhausted, is also erroneous. The depths and stripping ratios at which coal can be economically stripped have continuously increased over the years (Nugent Dep. 373, 374; Tr. 93, 1866; Organ Dep. 111-112, 136-137). And a former UEC president testified in his 1968 deposition that the Industry Field will be mined when

commercially mineable coal in Fulton County is exhausted in 10 or 12 years (Nugent Dep. 343). Exhaustion of the last of UEC's present mines is not expected to occur until sometime in the 1980's (see DX 60-C).

Moreover, if UEC does not now have adequate reserves, or the prospect of acquiring more, it is because of management policies imposed on it *after* the acquisition. After 1959 UEC management did not acquire strip reserves except in the area of existing mines although other companies were acquiring Illinois strip reserves for future mining during the 1960's (Tr. 1667-1668, 1867-1869, 1883-1885).

It is thus apparent that if UEC had remained independent, it would have had the means and the incentive to acquire any additional reserves it may need to remain in the strip mining business and to undertake the mining of its deep coal reserves. Accordingly, the district court should have found that the 1959 combination did eliminate an effective competitor and should have fashioned proper relief to restore UEC to the competitive position it would have occupied if the combination had not occurred. *Utah Commission* v. *El Paso Natural Gas Co.*, 395 U.S. 464, 470.

CONCLUSION

Probable jurisdiction should be noted.

Respectfully submitted.

ERWIN N. GRISWOLD,
Solicitor General.

THOMAS E. KAUPER,
Assistant Attorney General.

ALLAN A. TUTTLE,
Assistant to the Solicitor General.

CARL D. LAWSON,
RONALD L. FUTTERMAN,
Attorneys.

SEPTEMBER 1972.

APPENDIX A

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

No. 67 C 1632

[Filed Apr. 13, 1972]

UNITED STATES OF AMERICA, PLAINTIFF.

vs.

GENERAL DYNAMICS CORPORATION; THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION, DEFENDANTS.

DECISION ON THE MERITS

In this antitrust divestiture action, the Government attacks the 1966 merger of General Dynamics Corporation with The United Electric Coal Companies (United Electric). The Government bases its complaint upon the contention that the General Dynamics-United Electric merger violated Section 7 of the Clayton Act. 15 U.S.C. § 18.[1] The juris-

[1] Section 7 of the Clayton Act provides, in pertinent part, as follows:

"No corporation shall acquire, directly or indirectly, the whole or any part of the stock or . . . assets of one or more corporations engaged in commerce, where in any line of commerce in any section of the country, the effect of such acquisition . . . may be substantially to lessen competition, or to tend to create a monopoly."

diction of the court pursuant to 15 U.S.C. § 25 is undisputed. After a trial on the merits and evaluation of the massive quantity of evidence submitted by the parties,[1] this court is of the opinion that judgment should be rendered for the defendants.

I. THE DEFENDANTS

General Dynamics

The defendant General Dynamics Corporation (General Dynamics) is a Delaware corporation with its principal executive offices located in New York. General Dynamics is a large, diversified corporation selling to government services and agencies, as well as to industrial and commercial customers. Over 85 per cent of General Dynamics' annual sales are to government services and agencies, and principally consist of aircraft, space, communications, and marine products. General Dynamics' sales to industrial and commercial consumers include commercial communication equipment, building materials, lime, machinery, and the subject of this litigation: coal.

The evidence at trial reveals that General Dynamics acquired Material Service Corporation (Material Service) in 1959, as part of its attempt to diversify into commercial, nondefense business. Material Service was at that time a midwest producer and sup-

[1] The record in this case consists of more than 7,500 pages of trial transcript and deposition testimony, and more than 800 trial and deposition exhibits, containing in excess of 10,000 pages.

plier of building materials, concrete, coal and limestone; it owned all of the stock of the defendant Freeman Coal Mining Corporation (Freeman) and 34 per cent of the outstanding stock of the defendant United Electric.

At the time of the General Dynamics-Material Service merger, General Dynamics was also seeking diversification through development of commercial products stemming from such subsidiary programs as the Convair 880/990 jet transport; Canadair's commercial turbo-prop CL-44 and CL-540 aircraft; General Atomic's nuclear research maritime and power reactors; Liquid Carbonic's industrial gases; and Stromberg-Carlson's telephone and high fidelity sound equipment. By the time of trial, however, these diversification ventures had been discontinued or sold, with the exception of Stromberg-Carlson's communication equipment business. In the early 1960's, General Dynamic's Convair Division phased out its commercial jet transport production program. During 1967, General Dynamics sold General Atomic to Gulf Oil Corporation, and in 1969, as a result of an adverse decision in *United States* v. *General Dynamics Corp.*, 258 F.Supp. 36 (S.D.N.Y. 1966), it sold Liquid Carbonic to Houston Natural Gas Corporation.

General Dynamics is the fifth largest coal miner among commercial producers. Through its two coal subsidiaries, Freeman and United Electric, General Dynamics had combined sales of nearly 15 million tons in 1967. The evidence did not disclose that

General Dynamics presently engages in any aspect of either the electric utility or fuel industries other than coal production.

Freeman Coal Mining Corporation

The defendant Freeman is an Illinois corporation headquartered in Chicago, Illinois. Freeman was acquired by the Burton Coal Company in 1922, the same year it acquired its first mine, the Bobby Dick, located in Williamson County, Illinois. Throughout its history, Freeman's mining operations have been centered in Jefferson, Franklin and Williamson counties in the Southern Illinois Freight Rate District.[3] In addition, it has operated the Crown Mine in the Springfield Freight Rate District located in central Illinois.

Material Service acquired Freeman and the assets of Burton Coal Company, both of which were in bankruptcy, in 1942. Empire Building Corporation which, like Material Service, was controlled by the Henry Crown family, acquired the stock of the Chicago, Wilmington & Franklin Coal Company (CW&F) in 1954. After the acquisition of CW&F stock by Empire Building Corporation, Freeman operated the mines of CW&F and sold the coal which they produced. Thus from 1955 forward, CW&F and Freeman were, for all practical purposes, one coal company.

---

[3] The Interstate Commerce Commision has designated various coal producing areas within Illinois, Indiana and western Kentucky as Freight Rate Districts. See, *e.g.*, *Ayrshire Collieries Corp.* v. *United States*, 335 U.S. 573 (1949).

Among 37 coal producers in the midwest, Freeman ranks eighth in terms of coal reserves in Illinois, Indiana and western Kentucky, but controls less than four per cent of the total midwest reserves controlled by these companies in 1968. Of the nine "leading" Illinois coal producers[4] reporting their coal reserves, Freeman ranks sixth in reserve holdings. Of the 11 "leading" producers in the three-state area, Freeman ranks seventh in reserve holdings. Freeman controls 6.5 per cent of the more than 2 billion tons of coal reserves dedicated to existing mines in Illinois, Indiana and western Kentucky as of 1968.

While Freeman's reserves in central Illinois are of relatively low BTU value[5] and have a sulphur content of over three per cent, substantially all of the reserves and production at Freeman's Orient mines are high quality, high BTU coal with a sulphur content of less than 2.5 per cent, and ranging as low as one per cent. Approximately one-half of Freeman's other reserves in Williamson and Jefferson counties have a sulphur content of less than 1.5 per cent.

Approximately eight per cent of Freeman's production is sold for metallurgical purposes, and an addi-

---

[4] The Government in its statistical exhibits has designated certain midwest coal producers as "leading producers." *See, e.g.*, Government Exhibits 79 and 85.

[5] Coal, gas, oil and nuclear energy produce heat, measured in terms of BTU's (British Thermal Units).

tional 10 to 11 per cent is sold as dust.* All of Freeman's mines are deep shaft operations and, aside from its relationship with United Electric, Freeman does not appear to have ever operated any strip mines and apparently possesses neither experience nor expertise in strip mining. None of Freeman's mines or coal reserves are located in a Freight Rate District in which United Electric operates a mine or controls reserves.

The United Electric Coal Companies

The defendant United Electric was formed in 1919 as a consolidation of several coal properties located in the vicinity of Danville, Illinois. United Electric presently operates only the following four strip or open pit mines, all of which are in Illinois: the Cuba Mine located in Fulton County and opened in the early 1920's; the Fidelity Mine located in Perry County and opened in 1928; the Buckheart Mine located in Fulton County and opened in 1937, and the Banner Mine located in Fulton and Peoria counties and opened in 1960. In addition, United Electric has operated the following strip mines for the periods of time indicated: the Freeburg Mine located in St.

---

* The trial testimony indicates that dust is a by-product which occurs during the preparation of metallurgical coal. In the past, it was thrown away on "gob piles" at the mines. In more recent years, however, special equipment for the handling and burning of dust has been developed and installed at certain generating facilities which permits the use by them of limited amounts of dust along with regular coal screenings as boiler fuels. Dust is sold at a price under its cost of production.

Clair County, Illinois, was reopened in 1936, having been idle since 1933, and was closed in 1949; the Solar Mine located in Schuyler County, Illinois, was opened in 1945 and was closed in 1949; the Buffalo Creek Mine located near Madisonville, Kentucky, was opened in 1947 and was closed in 1959; the Skyline Mine located in Breathitt County, Kentucky, was opened in 1952 and was closed in 1956; and, finally, the Mary Moore Mine located in Vermillion County, Illinois, was opened in 1955 and was closed in 1965 upon the exhaustion of strippable reserves. United Electric also had a small deep coal mine in the 1920's and an underground mining operation at its Buffalo Creek Mine from June of 1952 until 1954. The evidence indicates that although United Electric was the largest strip coal mining company in Illinois in 1948, during the succeeding 20 years it opened only two new mines in the midwest (Banner and Mary Moore) and closed four mines (Solar, Freeburg, Buffalo Creek, and Mary Moore). Furthermore, it was shown at trial that the Cuba Mine was likely to close in the immediate future, while the Banner Mine would be exhausted in approximately five years.

Ownership and management of United Electric remained essentially the same from the late 1930's until 1954, when Material Service acquired 10 per cent of United Electric's stock. This acquisition was disclosed that year to both the Government and United Electric's stockholders. During the course of the next few years, Material Service increased its ownership in United Electric; by 1959, Material

Service controlled more than one-third of United Electric's outstanding stock. That year Material Service (and Freeman, its wholly-owned coal subsidiary) requested and received representation on United Electric's Board of Directors. As a result, Frank Nugent, President of Freeman, was made Chairman of United Electric's Executive Committee.

With the affiliation of Freeman and United Electric thus formalized in 1959, common control of the two coal companies was achieved.[1] This development was immediately disclosed to the public, as well as to competitors and customers of both Freeman and United Electric. Within months, Material Service was itself acquired by General Dynamics. An investigation by the Antitrust Division of the Department of Justice ensued, during which the Government was furnished information with respect to the stock ownership of Freeman and United Electric. No further action was taken by the Government.

During the early 1960's, General Dynamics continued to purchase United Electric stock, and, by 1966, immediately prior to its tender offer for the balance of United Electric's outstanding shares, General Dynamics held 66.15 per cent of the outstanding shares of United Electric's stock. In addition, throughout this period, the Material Service Profit Sharing Trust owned approximately 6.8 per cent of the outstanding stock of United Electric. General Dy-

[1] The evidence shows that United Electric had earlier made unsuccessful attempts to merge with, or to acquire, other Illinois coal producers.

namic's control of United Electric was continually disclosed to the public throughout the 1960's.

At the Board Meeting of General Dynamics on September 30, 1966, the directors authorized a tender offer to purchase the remaining outstanding shares of United Electric. That tender offer was successful: as of December, 1966, General Dynamics had acquired at least 90 per cent of the outstanding shares of United Electric stock, and shortly thereafter United Electric became a wholly-owned subsidiary of General Dynamics. The Government then filed this action on September 22, 1967, challenging the legality of the United Electric-General Dynamics affiliation under Section 7 of the Clayton Act.

The four operating United Electric mines (Cuba, Buckheart, Banner, and Fidelity) produced 5,750,000 tons of coal in 1967. As of December 31, 1969, United Electric's midwest coal reserves were down to approximately 118,000,000 tons.* Only 52,000,000 tons, consisting of Illinois strip reserves dedicated to United Electric's four existing mines, were shown at trial to be economically mineable. *Significantly, all but 4 million tons of the economically recoverable coal reserves of United Electric have been sold under long term contracts.* The balance of United Electric's coal reserves consists essentially of strip reserves at the Industry Field in McDonough and Schuyler counties in Illinois, and undeveloped deep reserves in the

* United Electric also controls certain coal deposits located in Colorado and Oklahoma, which are not in issue in this litigation.

Round Prairie Field in the Belleville Freight Rate District.

Among 37 coal producers in Illinois, Indiana, and western Kentucky, United Electric ranks eleventh in coal reserves, with less than one per cent of the total midwest reserves controlled by these companies in 1968. Of the nine "leading" Illinois producers[9] that reported their reserves, United Electric ranked eighth in reserve holdings. Of the 11 "leading" producers in the three-state area, United Electric ranked tenth in reserve holdings. Of the more than 2 billion tons of coal reserves dedicated to existing mines in Illinois, Indiana and western Kentucky, United Electric controlled 52,033,304 tons (of which only 4 million tons were contractually uncommitted) or approximately 2.5 per cent.

In contrast with Freeman, all of United Electric's production and coal reserves have an average sulphur content greater than 2.5 per cent. Furthermore, United Electric produces virtually no metallurgical coal. Combining statistically the reserves and production of United Electric and Freeman the result is as follows: The two companies together control 4.81 per cent of the total coal reserves in Illinois, Indiana and western Kentucky,[10] and account for 10.9 per cent of the area's production, *a more than 10 per cent decrease in the combination's percentage of such production since 1959.*

---

[9] See n. 4, *supra.*

[10] If United Electric's unmineable reserves are excluded, the per cent of coal reserves controlled by these two companies would aproximate 4.25 per cent.

II. BACKGROUND OF THE COAL INDUSTRY

Coal mining today is undergoing a period of rapid and pervasive change. Major readjustment in the structure and patterns of coal production and distribution has been required, and continues to be required."

Changes in the Demand for Coal

In 1920, coal accounted for 78.4 per cent of the energy resources consumed in this country. With the exception of the years during World War II, coal's share of the energy market declined steadily thereafter, and by 1968 represented only 21.4 per cent of this nation's energy resources. Since World War II, coal has been a decreasingly effective competitor for a number of uses and has been unable to maintain its position as a dominant fuel. Coal consumption in the United States declined from 441 million tons in 1947 to 277 million tons by 1954, primarily because coal lost its railroad and home heating markets to oil and gas. There is no longer a railroad market for coal, and since World War II the use of coal for space heating has declined 80 per cent or more. Furthermore, its use in the industrial market has failed to keep pace with the growth of in-

---

" As long ago as 1955, the president of the Chicago, Wilmington and Franklin Coal Company, a midwestern coal producer, had commented that "[t]he coal mining industry has run into a series of evolutionary changes which have caused a shrinkage in demand for its product and have brought severely competitive conditions." Defendants' Exhibit 48.

dustry during this period. The evidence clearly shows that coal's decline in these markets will continue as additional residential and industrial consumers convert to oil and gas.[12] The net result of these losses has been a diminished position for coal in the overall energy resource consumption pattern. Coal consumption in 1967 and 1968 was less than in 1947 and 1948. These national trends and patterns are paralleled in the midwest.

Emergence of Utility Demand as the Principal Market for Coal

As a result of market losses to other forms of energy, the utility market has become the mainstay of coal production, although the use of coal has not kept pace with the growth of utility output. In the utility market, coal also faces competition from other sources of energy, including not only natural gas, oil, and nuclear fuel, but also such emerging competitors as pumped storage[13] and geothermal energy.[14] The

---

[12] As one retail coal dealer in Chicago expresed it: "We feel that the retail coal industry, as an industry, if you can call it that, has a life of only about five years. . . . I think you could compare it to the ice business." Peterson Deposition, p. 14.

[13] At a pumped storage facility, water is pumped into an elevated reservoir by energy generated at the most economical base-load station during off-peak hours. During the periods of peak demand, the cycle is reversed and the water runs down from the facility through hydroelectric turbines to generate power.

[14] In a geothermal system, underground steam is tapped directly to provide power to drive turbine generators.

evidence clearly indicates that coal's present dominant position in the utility industry will suffer increasing erosion, and nuclear energy may eventually displace coal entirely as an energy source for midwest utilities. Ernest Tremmel, Director of the Division of Industrial Participation of the United States Atomic Energy Commission, testified that, in the long term, electricity could be generated at the lowest cost by a utility system combining nuclear and pumped storage facilities, together with gas turbine peaking units.

More immediately, air pollution abatement regulations will have an adverse impact on coal during the next 10 to 20 years due to their effect on interfuel competition and consumption patterns of coal. A number of witnesses testified that there is and will continue to be a tendency to turn to other fuels, such as gas, oil, and nuclear energy, as a means of coping with air pollution abatement regulations. The net effect of this trend will be an increase in the consumption of these fuels at the expense of coal. In their report to the Federal Power Commission, the West Central Region Advisory Committee [15] predicted that in the midwest, coal's share of the electric utility market would decline from 72.2 per cent in 1966 to 22.2 per cent by 1990, and nuclear energy's share will increase from one per cent to 69.7 per cent in the same period. The report specifically stated that:

---

[15] This committee includes executives of such major midwest utilities as Commonwealth Edison, Northern States Power, Wisconsin Electric Power, Union Electric Company and Illinois Power Company, among others.

> "During the period 1970-1990, electric generation will be dependent upon five basic forms of energy—coal, gas, oil, hydro, and nuclear. . . . Coal, however, will be faced with continuing pressures from other forms of energy, and based on present trends the most significant competition will be from nuclear energy." Defendants' Exhibit 257, p. II-9.

Thus, the competitive situation within the energy market as a whole is already more fluid than it has ever been before and will become increasingly so in the future. Dr. Bruce C. Netschert, an expert in energy economics, testified that:

> "Competition is today more severe, more keen, among the fuels and between the fuels and between the fuels and electricity, and . . . intersubstitutability is also greater than it has been before. . . . [B]oth this competition and this intersubstitutability is likely to increase in the future. The choice facing the consumer is wider than ever before and will become still wider. Netschert Deposition, p. 53.

Changes in the Production of Coal

The fact that coal continues to be one of the suppliers of the energy requirements of the electric utilities reflects the success of coal producers in delivering coal at a low cost per BTU.[16] That coal producers

[16] The report of the West Central Advisory Committee to the Federal Power Commission, discussed *supra*, also stated that "[d]uring the past twenty years the coal industry has contributed a great deal to the stability of fuel prices." Defendants' Exhibit 257, p. II-9.

have been able to do this, despite sharply rising costs, reflects the technological revolution that has led to enormous increases in productivity, and to the ability to negotiate bulk shipment and unit train freight rates. The testimony and exhibits indicate that both coal prices and coal rail rates have increased far less than other prices in the economy.

Since 1947, despite a substantial rise in the level of the wholesale price index and labor costs, the delivered price of energy from coal has remained relatively stable. In fact, allowing for inflation, the price of coal at the mine mouth today is actually less than it was at the beginning of the postwar period. Defendants' Exhibit 85, Tables XX, XXI, XXIV. Since World War II, wage costs and fringe benefits have increased markedly in the coal industry. There has been a virtual revolution in mining technology, with the introduction of wholly new techniques, significant improvement in old techniques and a substantial increase in scale. The evidence shows that the effect of these technological changes has been to increase productivity (as measured in output per man-day) sufficiently to enable the f.o.b. mine price of coal to be kept competitive and relatively stable in the face of general inflation in wholesale prices. *E.g.*, Defendants' Exhibit 85, p. 4. Since World War II, the increased competitive pressure on coal in the utility market has led to increased pressure on the railroads to offer lower rates and has generated major technological innovations in railroad transportation, such as the unit train, which have permitted lower freight rates.

Changes in the Structure of the Coal Industry

The effect of the changes since World War II in the patterns of coal consumption and marketing, in labor costs, in mining technology, in productivity, in coal preparation procedures and in transportation costs has been to enhance the economies of scale production and to greatly increase capital requirements. This, in turn, has led to an increase in the size of mines. The parties stipulated that 83 percent of the coal produced in 1967 in Illinois, Indiana and western Kentucky, for example, was produced at mines with annual production exceeding 1 million tons; and 49 per cent from mines producing more than 2 million tons a year. Moreover, of the 36 mines placed in operation or announced in Illinois, Indiana and western Kentucky since 1958, none was smaller than 500,000 tons annual capacity, 29 were of a 1,200,000 tons annual production size or greater, and 20 produced or will produce 2 million tons or more per year. Defendants' Exhibit 87, Table 4. Clearly, mines of this size can only be operated by large coal producers. A 2 million ton strip mine, for example, would cost between $12.7 million and $23.5 million to construct, depending upon the overburden ratio,[17] and would necessitate 40 million tons of coal reserves. Defendants' Exhibit 87, Table 5a.

There are fundamental differences between the mines of the eleven "leading" coal producers (as

[17] The overburden ratio expresses the amount of overburden (cubic yards) which must be removed to uncover a ton of coal.

designated by the Government) in Illinois, Indiana and western Kentucky and the mines of the approximately 26 other coal producers. The latter are typically located in the West Kentucky or Southern Illinois Freight Rate Districts; have extremely limited coal reserves; produce small annual tonnages; operate only under very favorable strip mining conditions or are shallow deep mines; do not have substantial processing facilities; have limited transportation facilities; and usually sell through agents or dealers rather than directly to customers. These smaller producers rarely sell under long-term contracts with utilities. They do not and cannot constitute a substantial supply source for the energy requirements of electric utilities. As the testimony of a number of witnesses indicated, small producers are, for all practical purposes, in a "different business." [18]

The increasing predominance of the electrical utilities as purchasers of steam coal, the increase in the designed capacity of new electric generation units, and utilities' insistence on a large, reliable, and low-price source of fuel over the 20 or 30-year life of a generating facility, have led to the emergence and survival of coal producers with large reserves, developing large mines which are devoted to serving a smaller number of customers on long-term con-

---

[18] See Beck Deposition, p. 8; see also Steiner Transcript, pp. 2240-41; King Deposition, p. 38; Stiehl Deposition, pp. 18-19; Beck Deposition, p. 39; Camicia Transcript, pp. 1444-45; Davis Transcript, pp. 694-95, 764; Steel Transcript, pp. 938-39; Wood Transcript, pp. 659-60; Tomey Transcript, pp. 333-38; Schotters Deposition, pp. 11-12; Nicosia Deposition, pp. 37-38.

tracts. The progressive disappearance of the small coal producers reflects the disappearance of the railroad market and the decline of the space heating market, the retail market and spot coal purchases by utilities.

Not only is this litigation devoid of any signs of anticompetitive performance and behavior in the coal industry, but rather the past performance of the industry suggests there has been intense competition among coal producers. The intense competition which midwest coal producers face is likely to increase even more in light of competition from nuclear energy and other alternative fuels, growing concern with air pollution, pressures from large, informed and capable buyers of coal, and the presence of a substantial number of viable coal competitors. From all of the evidence presented at trial, it appears that coal producers will be under continuing pressure to reduce costs and keep prices low if they are to continue to serve their last remaining large market for steam coal.

The Principal Market for Coal: The Utility Industry

Since 1946, a constantly increasing percentage of total coal production has gone to electric utilities as railroad, retail, and industrial markets have been lost to other fuels. See Defendants' Exhibit 85, Table I; Defendants' Exhibit 216. This trend was true in the midwest and will undoubtedly continue, according to the evidence presented by at least two knowledgable witnesses.[19] Thus, while some 70 per cent of

[19] Gallagher Deposition Exhibits 1-3; Steiner Deposition Exhibit 2, paragraph 2.

United Electric's 1967 sales were to electric utilities, by January 1, 1969, more than 82 per cent of United Electric's mineable reserves had been sold to electric utilities under long-term contracts. In 1967, approximately 75 per cent of the coal production in Illinois, Indiana and western Kentucky was shipped to electric utility generating stations. In each of the years 1965 through 1967, the largest coal customers in Illinois were steam electric utilities. It is undisputed that in 1967, 72 per cent and 89 per cent of the coal produced, respectively, in the Fulton-Peoria and Belleville Freight Rate Districts, where all of the mines of United Electric are located, was sold to electric utilities. 95 per cent and 71 per cent of the coal produced, respectively, in the Springfield and Southern Illinois Freight Rate Districts, where all of the mines of Freeman are located, was sold to electric utilities.

The evidence demonstrates that in considering whether a particular coal mine can compete for the business of an existing power plant, several factors must be weighed. These include the cost of coal at the mine, the location of the mine relative to the consumer's plant, transportation costs, the BTU content of the coal and the suitability of the physical and chemical properties of the coal produced by a given mine for the particular plant facility involved. In the case of a new utility plant, coal supply arrangements are almost always made prior to plant construction, since the facility's coal burning equipment will be specially designed to handle the type of coal

that is to be made available. Arrangements for transportation of the coal are also likely to be made in advance. As a result, the location and design of a plant are frequently determined by the coal supply arrangements that can be made.

Because of (1) the need to assure a supply of coal that satisfies the physical and chemical requirements of the equipment designed, (2) the complexities of administering multiple coal contracts, and (3) the development of large-scale transportation arrangements with their attendent economies, coal supply for large power plants is likely to be developed with relatively few producers. Indeed, many plants are supplied by only a single producer from a single mine opened specifically to serve that single facility. Such supply arrangements also exist in the case of mine-mouth generating plants where the adjacent mining property is expected to meet the lifetime requirements of the plant. In arranging for its coal supply, a utility will not only seek the lowest possible price per BTU of delivered coal, it will also seek assurance of the coal supplier's capability of providing the required quantities of coal over a long period of time. Utilities are therefore concerned about the reliability of the coal supplier and his past record of performance in satisfying contractual commitments. As one of the consumer witnesses emphasized, when a utility is arranging for the fuel supply for a modern generating station representing an investment of several hundred million dollars, it wants "to know that

the people you sign a contract with are able to produce on their end of it." [20]

The testimony also indicates that a utility consumer will weigh heavily its previous experience with potential suppliers and will carefully investigate the availability of adequate coal reserves within the supplier's control to satisfy the contractual commitments. The utility will seek independent geological verification of the existence and size of the coal reserve and the physical and chemical properties of the coal, as well as the producer's technological capabilities.[21] Since 1947, the average size of steam-electric generating plants, and units within those plants, has increased enormously. By 1966, the average size of new units being installed was almost as large as the combined total size of *all units* at existing plants. Defendants' Exhibit 86, Table following p. 9. The increasing size of electric power generating units and plants has been accompanied by an increase in the quantity of coal required at such facilities. A large, modern coal-fired generating unit of a thousand megawatt capacity would require, over its 30-year life, a total of 70 million tons, or approximately 2½ million tons of coal annually. A plant containing three such units (a size shown by the evidence likely to become commonplace) would,

---

[20] Tomey Transcript, pp. 336, 338; Gamble Transcript, p. 1263.

[21] See, *e.g.*, Defendants' Exhibit 86, p. 4; Hill Transcript, p. 1113; Gamble Transcript, p. 1263; Wood Transcript, pp. 678-79; Steele Transcript, pp. 996-997.

therefore, require committed mineable reserves of well over 200 million tons.

A 1000 megawatt plant may cost as much as 150 to 200 million dollars. This major investment can be jeopardized by a disruption in the supply of coal. Utilities are, therefore, concerned with assuring the supply of coal to such a plant over its life. In addition, utilities desire to establish in advance, as closely as possible, what fuel costs will be for the life of the plant. For these reasons, utilities typically arrange long-term contracts for all or at least a major portion of the total fuel requirements for the life of the plant. Illustratively, of the 74 million tons of coal purchased in 1967 by midwest utilities (other than municipal utilities) from mines in Illinois, Indiana and western Kentucky, *it is undisputed that approximately 76 per cent was purchased under contracts of five years or longer and 43 per cent was purchased under contracts of 15 years or longer duration.*

The long-term contractual commitments are not only required from the consumer's standpoint, but are also necessary from the viewpoint of the coal supplier.[22] Such commitments may require the development of new mining capacity. As a rule of thumb, a mine capable of producing a million tons of coal annually required, in 1969, an investment of between six to ten million dollars. Coal producers have been reluctant to invest in new mining capacity

---

[22] *Cf., Tampa Electric Co.* v. *Nashville Coal Co.*, 365 U.S. 320 (1961).

in the absence of long-term contractual commitments for the major portion of the mine's capacity. Furthermore, such long-term contractual commitments are often required before financing for the development of new capacity can be obtained by the producer.

This trend toward long-term contractual commitments to meet the total requirements of a particular electric power generating plant has tended to eliminate the spot market for coal. From time to time, a utility consumer may purchase small quantities of coal on the spot market and long-term contracts are often written to permit some flexibility in this regard. However, because utilities are increasingly arranging for bulk transportation of coal supply on a long-term basis, the opportunities for spot purchases are declining except in those cases in which small mines may be located in such proximity to make them capable of providing some relatively small deliveries at low cost. Moreover, the rail rate cost advantages of trainload deliveries compared to carload deliveries are such as to limit the desirability of such spot purchases. The growing practice by coal producers of expanding mine capacity only to meet long-term contractual commitments, and the gradual disappearance of the small truck mines has tended to limit the production capacity available for spot sales.

Competition for Utility Contracts

Because of the trend toward long-term contracts and away from spot purchasing, competition in the

electric utility market is not continuous in the sense that coal producers seek new orders from a given facility on a daily, monthly or even annual basis. Rather, competition tends to be a "one time thing." Once the initial coal contract is executed, competition to satisfy the coal requirements of a particular plant is effectively precluded for an extended period of time amounting to as much as 15 years or even the full life of the plant. This competition for long-term supply contracts, rather than competition for the sale of coal already produced, is of a kind in which a small producer or a producer without large reserves cannot effectively participate. This has led to the disappearance of small producers as active competitors in the utility market. Furthermore, the innovations in the coal industry that have made coal prices competitive with other forms of energy have created the need for large scale production and, thus, for large companies. Experts for both the Government and the defendants agreed that under these circumstances, increase in the size of coal mining companies and the concentration of more production in fewer mines, as well as more output of a given mine devoted to a particular source, have been economically inevitable.[23]

Correspondingly, mergers within the *utility industry* have both diminished the number of utility companies and increased the purchasing power of those surviving. Since 1955, there have been more than 50 mergers among midwestern public utilities. In

---

[23] Steiner Deposition, p. 176; Folsom Transcript, p. 2581.

1967, the four largest utility companies in the midwest, ranked by coal consumption, accounted for 53 per cent of the coal consumed by electric utilities in the states of Illinois, Indiana, Wisconsin, Iowa, Minnesota, Missouri, Kentucky, and Tennessee. Commonwealth Edison alone consumed approximately 33 per cent of the total coal production of the Freight Rate Districts in which Freeman and United Electric mines are located.

Fuel expenditures are a major component of a utility's operating costs.[24] In light of this, electric utilities typically regard fuel purchasing as a major executive responsibility and these buyers are characteristically sophisticated about the available alternatives. This circumstance provides another source of pressure on coal producers to seek to minimize costs and to keep coal prices low. George Gamble, a director of Union Electric Company, testified that coal contracts would characteristically be reviewed by that company's Executive Committee, as well as its Board of Directors. Gamble Transcript, p. 1264. Similarly, Elmer Hill, formerly of TVA, testified to the care taken in evaluating coal bids:

> "* * * [W]e had a staff of engineers. Each time we evaluated offers for supply to any of TVA's facilities, the reserves were checked, the equipment to be employed in supplying the coal was evaluated. With the engineering knowledge

[24] For example, in 1969, almost 50 per cent of Commonwealth Edison's operating expenses, excluding depreciation, were accounted for by fuel and power purchases. Defendants' Exhibit 90, p. 4.

and know-how as to mining, it could be reasonably determined what the cost for production would be." Hill Transcript, p. 1113.

The evidence further indicates that utilities possess and exercise the power to play coal producers against one another. As the president of one utility stated: "[W]e attempt to use whatever leverage we can to get the prices we can." Davis Transcript, p. 745. He explained that his company at the outset attempts to get a low-cost contract with one coal supplier, and then tries "to use that leverage on the other suppliers to obtain substantially the same price." Davis Transcript, p. 759. Finally, interfuel substitutability provides an additional bargaining advantage to utilities.

The bargaining power of utilities will increase even more in the years ahead, as midwest utilities pool their purchasing power by joining together to coordinate the planning, construction and utilization of generating and transmission facilities. See Defendants' Exhibits 232, 233; Defendants' Exhibit 257, Section IV and Appendices A, B, and C. As a result, and because they purchased coal in huge quantities, utilities have substantial market power as compared with coal producers. George Gamble described this power as follows:

> "Anytime that you are in a position to sign up over a period of 15 or 20 years for a block of business between $50 and $100 million, you've got power in the market, and [if] the coal producers can get hold of a large contract, which would run over a number of years, why, they

know what they can do, they know what they can afford to do in the shape of opening mines and buying machinery, and it's a very important thing to them.

"Consequently, there is a great economic power in the hands of the coal purchaser." Gamble Transcript, pp. 1264-1265.

Recognizing the validity of this analysis, the Government has conceded that utilities have at least equal bargaining power with coal producers in the midwest.

III. INTERFUEL COMPETITION

Energy resources consumed in the midwest include, among others, coal, natural gas, oil, nuclear energy and hydropower. Coal, gas, oil and nuclear energy produce heat, measured in terms of BTU's. Heat thus produced by any one of these energy resources can be used for various purposes, including the generation of electricity. Hydropower is also used to generate electricity. Coal, oil and gas are used to produce space and processing heat.

Coal, oil, gas and nuclear energy compete with one another in the utility, space heating and process heat markets.[28] Electricity (including that generated by hydropower and pumped storage) in turn competes with coal, oil, gas and nuclear energy for parts of these same markets. Coal's share of the energy market reached its peak in 1910. Since then, coal's position has been eroded in one market after another.

---

[28] Process heat is that used in the manufacture of chemicals, drugs, foods, glass, metals, cement and the like.

The railroads, once coal's mainstay, have been completely lost to oil through dieselization. The use of coal for space heating has already suffered a dramatic decline and is expected to disappear completely within five to ten years at the most.

Interfuel competition will continue to erode coal's share of the energy market as more and more industrial consumers convert from coal to gas or oil, and as these fuels, along with nuclear energy and the emerging technology of still other alternative power generation sources, further challenge coal's share of the fuel needs of electric utilities. Competition among fuels is a complex of economic, technological and political forces, and results from the ability and willingness of energy consumers, in light of these forces, to shift from one fuel or supplier to another. As a recent report of the Federal Trade Commission points out in a chapter to which the Government's rebuttal economist contributed,

> "• • • There is a high elasticity of substitution among coal, fuel, oil and natural gas as raw materials from which energy is produced. This is particularly marked in the case of electric utilities which have constructed generating stations so they can ultimately consume any of the three principal fuels." Folsom Transcript, p. 2494.

In determining the type of fuel to be used, a consumer reviews and evaluates a number of factors. Thus, the choice between competing fuels depends not only on delivered price, but on such matters as relative

thermal efficiencies and differences in capital costs of burning equipment as well. The costs of storing, handling, and in some instances, disposing of the fuel by-products or residue, for example, are economic factors which can make a low-cost fuel the most expensive fuel. These costs become a particularly important consideration in selecting a proper fuel in locations where land costs are high and in heavily congested areas. In some areas, operating considerations, such as air pollution control regulations, may require a premium priced fuel and foreclose consideration of others.

Energy consumers themselves testified at trial concerning the vigorous competition coal encounters from other fuels in the market place. As the representative of one midwest utility attested,

> "Certainly competition between coal suppliers is a big factor [in controlling the cost of coal], but I believe overriding this, which sets the overall competitive picture, is the alternate fuel competition. There is competition among all fuels as well as among coal suppliers." Wood Transcript, p. 661.

Coal producers, as well, confirmed the intense competition they face from suppliers of alternate fuels. See, *e.g.*, Beck Deposition, p. 8; King Deposition, p. 17; Stiehl Deposition, pp. 14-16.

Competition from Gas and Oil

The extensive competition which coal faces from gas and oil may be seen in the response of midwest

coal consumers to the questionnaire forwarded them under subpoena issued by this court. While the survey was directed solely to coal consumers, and thus takes no account of facilities consuming *only* other fuels, it reveals that, even among those midwest facilities (both utility and nonutility) which consume substantial amounts of coal, some 48 per cent have already installed the capability of consuming either gas or oil as well. Defendants' Exhibit 59, Table C. The subpoena questionnaire responses also demonstrate widespread actual usage of gas and oil as alternative fuels by these utility and nonutility facilities. Thus, nearly half of those facilities with an oil capability actually used oil during 1967, while of those facilities with a gas capability, 80 per cent actually consumed gas for six months of the year or more. Defendants' Exhibit 59, Tables C, D, E. Whether or not facilities actually consume gas or oil, however, their dual or triple fuel capability is a device used by them to play one energy source against another in keeping their fuel costs at a minimum.

Industrial Consumers

Coal has already lost its once dominant position with midwest industrial energy consumers. It has been estimated that 45 per cent of all such facilities in the midwest have already turned to gas, while another 20 per cent have switched to oil. Walker Deposition, pp. 11-12; Peterson Deposition, p. 10. The trend of industrial consumers away from coal is a continuing one. A recent fuel-use inquiry by the

Chicago Department of Environmental Control, for example, revealed that, of the nine responding manufacturing plants located within the City of Chicago which had earlier indicated in response to the court-ordered subpoena questionnaire that they were burning high sulphur coal, six have converted or will convert to the use of gas and oil exclusively. Of the remaining three manufacturing plants, one indicated that it would be burning two-thirds more gas and oil and one-third less coal than in 1967, while the other two were switching from the use of high sulphur coal produced in Illinois to low sulphur coal from other areas. Defendants' Exhibit 239.

The evidence also demonstrates that many other mid-western industrial and institutional consumers are converting from coal to other fuels. The facilities of American Distilling, Corn Products and Standard Brands in Pekin, Illinois; Hiram Walker and Keystone Steel in Peoria, Illinois; American Can in Green Bay, Wisconsin; Northwestern States Cement in Mason City, Iowa; McDonnell-Douglas and Proctor & Gamble in St. Louis, Missouri; American Maize in Roby, Indiana; the University of Chicago, the Metropolitan Sanitary District of Chicago, the City of Belleville, Belleville School District and St. Clair County, as well as the Government's own midwest facilities, for example, were all shown at trial to have recently discontinued the use of coal. Even the courthouse in which this litigation was tried was shown to have been converted recently from coal to a combination of gas and oil. The evidence revealed, more-

over, that the Government considers a careful economic appraisal of the relative merits of gas, oil, coal and other alternative fuels so important and common in its fuel purchasing decisions that the General Services Administration has prepared a standard form, "GSA Form 1289, Heating Fuel Economic Analysis," to assist in the process.

Utility Consumers

Oil and gas are also important competitors for the fuel requirements of midwest utilities. In some midwest states, for example, oil and gas already supply 50 per cent of the energy requirements of electrical utilities.[**] As a report to the Federal Power Commission by a group of midwest utility executives points out,

> Although coal is available in sufficient quantities in the West Central Region to supply the entire energy requirements of the electric utilities in this region, competition will determine the extent to which coal will penetrate each market." Defendants' Exhibit 257, p. II-9.

While the subpoena questionnaire was addressed only to the coal-fired facilities of midwest utilities, it revealed that, even with respect to these, 55 per cent were capable of burning gas and/or oil as al-

---

[**] Significantly, the only utility executive called to testify by the Government, Daric N. Miller, Manager of Electric Production, Kansas Power and Light Company, was from an area where 91 per cent of the fuel requirements of utilities are supplied by gas, eight per cent by oil and one per cent by coal. Miller Transcript, p. 1723; Defendants' Exhibit 138, p. 20.

ternatives to coal. Furthermore, 79 per cent of the utility facilities equipped to consume gas actually did so for six months or more during 1967. Installation of multi-fuel capability is not confined to small generating plants. This may be seen from the fact that the facilities with multi-fuel capability consumed close to 50 per cent of the coal shipped to large utility systems in the midwest.

Because of the growing concern with air pollution, oil and gas are rapidly increasing their share of the fuel business of midwest utilities. This includes even those utilities in close proximity to coal fields which have relied principally on coal to provide their generation in the past. Illinois' largest coal consumer, Commonwealth Edison, which 10 years ago had 58 coal-fired boilers in Chicago, today has less than a dozen.

Also leading to increased usage of gas and oil by midwest utilities is the fact that many utilities are increasing their capacity through installation of gas and oil peaking units. The capacity which these peaking stations represent has increased substantially in recent years. For example, the most recently announced gas turbine peaking station of Northern States Power Company has a capacity of 300,000 kilowatts. This exceeds the average size of the coal-fired base-load units being installed only five years ago. Such peaking units represent a significant portion of the new capacity being installed by utilities in the midwest."[27] Thus, the combined capacity of

[27] See Defendants' Exhibit 138, Table 6, pp. 73-86; Defendants' Exhibit 234, p. 4.

Northern States Power Company's gas and oil peaking stations (500,000 kilowatts) was shown to be equivalent to a coal-fired station consuming approximately one million tons of coal annually.

In the utility market, coal is also faced with a secondary level of competition from alternate fuels. The growth in demand for electricity which has occurred in recent years is not due to increased demand for illumination, where electricity is faced with virtually no competition. Rather, it is due to expansion of the use of electricity for home heating, air conditioning and appliances. These are areas where the electricity which coal generates encounters severe competition from oil and gas. Competition at the secondary level has become particularly intense in recent years with the development of the "total energy" concept where gas and oil are used not only to provide energy for heating, air conditioning and appliances, but for on-site generation of electricity as well.

Competition from Nuclear Energy

During the 1960's, the use of nuclear energy to generate electricity became a commercial reality, increasing still further the competition faced by coal. Thus, as of January, 1970, there were 16 nuclear plants in operation, 48 more under construction, and an additional 41 had been announced. Defendants' Exhibit 108. Midwest utilities have assumed a position of leadership in the development of nuclear-powered generating stations. Commonwealth Edison

was a pioneer in the field, and in 1960, opened the first privately financed nuclear generating station in the country. At the time of trial, Edison and TVA, the midwest's two largest coal consumers, accounted for approximately 20 per cent of the nation's private nuclear capacity on order, under construction or in service. TVA already has five nuclear units under construction which, when completed will represent approximately 25 per cent of its total generating capacity. At the close of 1970, Commonwealth Edison will have three nuclear units in operation. By 1973, the number will have more than doubled and some 40 per cent of its electric generating capacity will be nuclear. Beyond that, Edison already has plans for two more nuclear units in 1976 or 1977. Commonwealth Edison's spokesman at trial summed up the situation as follows:

> "Well, as far as Commonwealth Edison is concerned, we have sort of put our eggs in the nuclear basket. We believe that nuclear power is the best way to provide base load electric generation, and we intend to move in this direction." Corey Transcript, p. 1600.

Other utilities throughout the midwest are also committing themselves to nuclear energy. Northern States Power Company's first nuclear station became operational in 1971 and will be joined by two others in 1972 and 1974. Three Wisconsin utilities, Wisconsin Public Service Company, Wisconsin Power and Light Company, and Madison Gas and Electric Company have joined together to construct a large nu-

clear station which is scheduled to begin operations by 1972. Northern Indiana Public Service Company, Iowa Electric Light and Power Company, and Wisconsin Electric Power Company have also undertaken substantial commitments to nuclear energy. Dairyland Cooperative Company operates a small nuclear demonstration plant and plans to join with four other rural cooperatives in the construction of an additional nuclear station. Even those midwest utilities which do not presently employ nuclear energy emphasized at trial their continuing interest in, and financial support of, nuclear research and development, and the possibility that they might undertake nuclear commitments in the future. They stressed that even now they closely compare and evaluate the overall costs of nuclear and fossil fuel stations in all cases before making a decision as to which type of new generating capacity to install.

Even apart from environmental considerations, nuclear energy in the 1960's rapidly developed to the point where it was cost competitive with coal. In 1968, when TVA was planning a 3,300,000 kilowatt increase in its capacity, it carefully compared and evaluated both coal and nuclear fueled facilities and concluded that installation of a nuclear station would be more *economically* desirable.

The Atomic Energy Commission has considered nuclear energy to be a competitor of coal for the fuel requirements of electrical utilities, even those located in coal mining areas, since approximately 1965. The director of the Division of Industrial Participa-

tion of that commission testified at trial that fuel costs for a nuclear plant are "considerably cheaper than a fossil plant, and although the capital cost is higher, when you balance the total cost, this is why the utilities have gone to nuclear, because the total operating cost will tend to be lower in many cases due to the cheaper fuel cost." Tremmel Tr., p. 799. The Atomic Energy Commission estimated that by 1980, between 20 and 25 per cent of the nation's total generating capacity will be nuclear. Moreover, since these nuclear stations will be base-load facilities, i.e., operated continually, which are more fully utilized than older fossil units, the AEC has also predicted that between 30 and 35 per cent of the electricity actually generated in 1980 will be nuclear fueled.

The impact of increased installation of nuclear generating stations on the coal industry will be particularly severe in the midwest, where utility executives have reported to the Federal Power Commission that by 1990 nuclear facilities are anticipated to comprise 57 per cent of total capacity, with nuclear generation "expected to supply nearly 70 per cent of the region's energy requirements by that time." Defendants' Exhibit 257, p. S-5.

During the 1980's, when the so-called nuclear breeder reactor is expected to come into commercial use, two witnesses testified that coal's portion of the utilities' fuel business is likely to decrease further, with the possibility that it may ultimately be eliminated altogether.[28] The most significant advantage

[28] See Tremmel Tr., pp. 806-08; Netschert Dep., p. 38.

of the breeder reactor over present nuclear facilities is that the breeder reactor will actually make more fuel (which can be used or sold) than it consumes, thereby resulting in a negative fuel cost.

While there are substantial economies of scale in the construction and operation of nuclear facilities, this does not preclude the use of nuclear energy by the small utilities in the midwest. On the contrary, the evidence indicates that several smaller utilities have already undertaken the joint construction of large scale nuclear facilities.[29] Some midwest utilities have joined together in power pools such as MCPP (Mid-Continent Power Planners) (and MAIN (Mid-American Interpool Network) so that such joint nuclear projects can be more readily undertaken and efficiently coordinated in the future. Furthermore, the evidence also shows that companies with developed expertise and operating experience with nuclear energy, such as Commonwealth Edison, are available to lend technical assistance, and possibly supplies, to those undertaking nuclear commitments for the first time. Government's Exhibit 135. Moreover, the Atomic Energy Commission's witness also testified that quite apart from the utility market, nuclear energy has now developed to the point where its use as an alternative to coal for industrial facilities is already occurring, and can be expected to expand in the future as further technological advancements are made. Tremmel Tr., pp. 812-813.

---

[29] See Abrahamson Dep., pp. 19-20, 28; Morrison Dep., pp. 10-11; Moser Tr., pp. 1573-74; Steele Tr., p. 963.

Other Alternative Power Sources

Hydropower has long been a competitor of coal in the midwest. TVA, the midwest's largest coal consumer, originally used hydropower exclusively, and presently operates approximately 40 hydropower stations. Coal's competition in the midwest from this source of energy is expected to increase in the future in view of the steps being undertaken to integrate the huge hydroelectric potential in Canada with power developments in the midwest through power pooling arrangements.

Pumped storage hydroelectric projects will further increase the competitive pressure on coal. The evidence shows that there is a growing commitment to pumped storage power generation in the midwest. Pumped storage facilities tie in well with nuclear generation, and an Atomic Energy Commission spokesman predicted at trial that, in the long term, electricity could be generated at the lowest cost by a combination of nuclear energy, pumped storage, and gas peaking. Tremmel Tr., p. 810.

Another alternative to coal expected to add to interfuel competition in the future is the generation of electricity by geothermal steam. In this method of generation, underground steam is tapped directly to provide power to drive turbine generators. While the evidence discloses that installation of such facilities has thus far been confined to the west coast, some scientists estimate that by 1980 geothermal energy could be generating as much as 10 per cent of the total electrical output of the country. Defendants'

Exhibits 178, 179. More immediately, one witness testified that increasing geothermal capacity on the west coast will free gas, presently required there for the generation of electricity, for use in the midwest. Walker Dep., p. 23.

Multi-Energy Companies

An additional aspect of the competition coal faces from other fuels is the fact that coal producers such as United Electric frequently find themselves competing with much larger corporate enterprises which produce and sell a variety of energy sources and can thus fill all of a utility's fuel needs, regardless of kind. In the past six years, the oil industry has established itself as a major element in coal production, linking under common ownership, in many instances, the energy resources of coal, oil, gas, uranium, oil shale and tar sands. Four midwestern coal producers are owned by oil companies: Pittsburg and Midway Coal Co. (Gulf Oil), Consolidation Coal Co. (Continental Oil Co.), Island Creek Coal Co. (Occidental Petroleum Corp.) and Old Ben Coal Co. (Standard Oil of Ohio). In 1967, these companies accounted for more than 25 per cent of the coal produced in Illinois, Indiana and western Kentucky. Defendants' Exhibit 85, Table XXVIII; Government's Exhibit 85.

A fifth midwestern coal producer, Ayrshire Collieries Corp., had announced plans in early 1969 to merge with Ashland Oil & Refining Co. The merger discussions were terminated, however, and Ayrshire subsequently combined with American Metal Climax,

Inc., a major producer, fabricator and marketer of metals and minerals.

Humble Oil, the principal operating subsidiary of Standard Oil (New Jersey) is constructing a deep mine in Illinois capable of producing 3 million tons per year for 20 to 30 years. Humble has entered into a long-term contract to sell the mine's output to Commonwealth Edison. Humble controls deep coal reserves in the midwest estimated at 3 billion tons. In addition to its sale of oil, natural gas and coal, Humble also has extensive holdings of uranium.

Air Pollution Restrictions Intensify the Competition Coal Faces from Other Fuels

Without question, air pollution has become one of the nation's most difficult and urgent problems. The burning of coal results in the emission of particulate matter and sulphur oxides. These substances were the first two emissions designated as pollutants by the National Air Pollution Control Administration. Beginning in 1955, the United States Department of Health, Education and Welfare undertook a study of the effect of sulphur oxide and particulate emissions on health. That study led the Department to conclude that these pollutants represented a serious health hazard when they exceeded certain levels in the atmosphere. The Department subsequently published the results of its studies, stressing particularly what it believed to be the minimum air quality standards for safety with respect to these pollutants. Defendants' Exhibit 89, pp. 1-3.

As a result of widespread concern over the deleterious effects of these pollutants, tremendous public pressure developed for the enactment of pollution control legislation and regulations to curtail their emission into the atmosphere. Even before such restrictions became effective in many areas, demands were made by groups pressuring utilities to reduce their consumption of high-sulphur coal by substituting low-sulphur fuels.

While attention was focused at the outset on establishment of air pollution restrictions in major metropolitan areas, smaller communities have also begun to adopt air pollution regulations, and statewide regulation, where not already established, is anticipated. Concerning this trend, S. Smith Griswold, the defendant's expert witness on air pollution, testified as follows:

> "I believe that you are going to have statewide regulations similar to those in New Jersey, generally. If you don't have a state-wide regulation, you are going to have industries moving out into rural areas, the less urbanized areas, and subsequent dislocation of your industrial developments. I feel that this probably won't be acceptable from the standpoint of the area that is losing . . . . industry because of the severity of [air pollution] controls, plus the fact that you will see a wide range of local regulations . . . designed to keep areas, which are now clean, from being polluted." Griswold Dep., p. 240.[10]

[10] Mr. Griswold was formerly Assistant Director of the National Air Pollution Control Administration of the U.S. De-

In light of this regulatory trend, electric utilities and other large coal consumers will not be able to avoid air pollution restrictions by locating future facilities in rural areas. Indeed, much of the demand for state-wide controls is from residents of rural areas who do not wish to see their present relatively pollution-free environment deteriorate.

Abatement Techniques and Their Effect on Coal

The air pollution restrictions adopted throughout the midwest are substantially increasing the already intense competition which coal faces from other fuels. Only coal-burning leads to particulate emission. Similarly, while coal is the principal source of sulphur oxide pollution, gas and oil burning result in only negligible sulphur oxide emissions, and nuclear energy, of course, leads to none.

While electrostatic precipitators have been developed which are effective in controlling the particulate portion of the pollution emitted during the burning of coal, many consumers have found it more economical to convert to alternate fuels, or even to close down older facilities, rather than to install such devices in order to continue burning coal. This is because electrostatic precipitators are extremely high cost items of capital equipment. *The installation of such equipment can cost 2 million dollars or more at a single facility.* Because of this high cost, electrostatic precipitators are not practical for small coal-

---

partment of Health, Education and Welfare, and for eleven years he was the Air Pollution Control Officer of the Los Angeles County Air Pollution Control District.

burning facilities. This fact has been recognized by the National Air Pollution Control Administration.[21]

Even for utilities, however, the cost of electrostatic precipitator equipment often represents such a high investment that it is more economical to convert from coal to the use of oil or gas. At the 359,000 kilowatt R. S. Wallace Station of Central Illinois Light Company, for example, six of the 10 boilers were converted to gas because, as the president of the company testified at trial: "We cannot put electrostatic precipitators on these boilers economically." Davis Tr., pp. 690-91. Similarly, the president of Interstate Power Company testified that his utility expected to discontinue the burning of coal at its Fox Lake Station altogether. He explains that rather than put in a $1,400,000 electronic or electrostatic precipitator, "we will probably change over to burning oil." Steele Tr., pp. 935-36; see also Tomey Tr. p. 400-01.

Sulphur Oxide Control Devices

While equipment is at least available for reducing particulate emissions, the technology for controlling sulphur oxides, the other principal pollutant emitted during the combustion of coal, is still under development. The significance of air pollution restrictions on interfuel competition and the marketing of coal is underscored by the fact that three of the Government's five rebuttal witnesses were called to testify regarding sulphur oxide pollution control devices.

---

[21] Middleton Dep. Ex. 4, p. 3-19; see also Defendants' Ex. 160.

The most that two of these witnesses would say, however, was that they believed their respective companies would be able to develop commercially acceptable sulphur removal devices within five years. Craig Tr., p. 2068; Quig Tr., p. 2201. Both witnesses conceded that such devices would be quite costly, and that not a single utility had been persuaded to install one. One of these witnesses admitted that utilities "may very well turn towards the use of substitute fuels." Quig. Tr., pp. 2191, 2198.[22]

Daric N. Miller, an executive of Kansas Power and Light Company, testified with respect to his company's decision to place the nation's first order for a sulphur pollution control device designed by Combustion Engineering Company. Although he admitted that his company had encountered problems from the day it started up a smaller demonstration model of the device, Mr. Miller expressed the belief that the equipment would be reliable. Significantly, he stressed that his company's facility would not be operating on coal produced in Illinois, Indiana or western Kentucky.

This Combustion Engineering device has been tested on coal produced locally, however, by Union Electric Company at its Meramec Station near St. Louis. An executive from that company testified that the device was "not commercially operable" and was, in

---

[22] The Government has not seen fit to order any such devices in connection with the air pollution reduction program at its own facilities. Instead, it has converted to lower sulphur fuels. Griswold Dep. pp. 221-26; Griswold Dep. Exhibits 3, 4.

fact, "shut down for more design changes" when he left St. Louis to appear at trial. Tomey Tr., pp. 358, 400. The device was, in fact, operable for only one of the first nine months following its installation. Griswold Dep. 87. As Mr. Griswold summed up the situation:

> "They have corrosion problems, they have every kind of problem. They have got so many problems they didn't think about, that they haven't gotten around, in some cases, to figuring out what the answers are to things they planned to determine in this study." Griswold Dep. 87-88.

Recognizing the magnitude of the problems encountered with the Combustion Engineering system to date, other midwest utilities have rejected it. Combustion Engineering's representatives have publicly stated that "the system cannot be considered commercially acceptable at this time," and a Federal panel of air pollution technology experts has concluded that even the system's presently known problems "may require several years of additional study." Nicosin Dep. 49-50; Schotters Dep. 15; Griswold Dep. Ex. 5. A spokesman from Union Electric stated: "It's strictly an experimental unit." Tomey Tr. p. 400.

The evidence also shows that recently the National Air Pollution Control Administration of the United States Department of Health, Education and Welfare, commissioned a panel of technical experts to review the status of United States and foreign sulphur oxide

abatement and control processes in order to provide a basis for increased governmental and public understanding of the problems involved in these areas. On the basis of its independent evaluation of oral and written presentations by 46 companies, including the three from whom representatives were called by the Government at trial, the panel

> "firmly concluded that, *contrary to widely held belief, commercially proven technology for control of sulfur oxides from combustion processes does not exist.*" Defendants' Exhibit 254, p. 3 (emphasis in original).

It is impossible to predict precisely when effective sulphur oxide pollution control devices will become commercially available. While witnesses expressed the hope that it would be soon, it may be 10 years or more before such processes are refined to the point where they are generally available for installation on, or planning for, power plants burning coal. Griswold Dep. 54-55. Although there is a great deal of research taking place with respect to sulphur oxide pollution control technology, it is important to recognize that as long as 20 years may be required to go from paper studies through laboratory experiments, pilot plants, prototype plants, and commercial demonstration to commercial application. As the recent study of the National Air Pollution Control Administration emphasized,

> [e]fforts to force the broad-scale installation of unproven processes would be unwise; the operating risks are too great to justify such action, and there is a real danger that such efforts

would, in the end, delay effective SO_2 emission control." Defendants' Exhibit 254, p. 3.

Instead, the study urged a high level of government support for several years to encourage research, engineering, development, and demonstration of a variety of the more promising processes, as may be suited to specific local and regional conditions.

In any event, there will be a long delay between the time sulphur oxide control devices become commercially proven and their actual implementation. Five years or more of advance planning are required in the construction of a modern utility generating station. Government counsel asked one utility executive whether, for a new plant being designed to burn low-sulphur coal from Montana or Wyoming, his company would consider using high-sulphur coal produced locally if an effective sulphur oxide control system were developed. He explained the problem:

> "Well, here we have a timing problem because you have to start designing boilers well in advance of the unit. For a 1976 unit, we will have to start next year in making some final design decisions, and so we will not have the time to wait until we are assured that an So_2 [sulphur dioxide] removal system would be available." Wood Tr. p. 622.

Adding to the competition problems faced by coal because of growing air pollution concern and regulation, is the fact that the control of particulate pollution and sulphur oxide pollution are negatively interrelated. In present particulate control technology, sulphur oxides are needed for ionization of the flue

gases, so that equipment which reduces the sulphur oxide reduces the effectiveness of the particulate control equipment. Moser Tr. p. 1530; Wood Tr. pp. 665-66; Corey Tr. p. 1686; Defendants' Exhibit 254, p. 44. In effect, as one problem is solved, another is created.

Cost projections show that sulphur oxide pollution control equipment will be quite expensive in terms both of initial capital cost and subsequent increased operating expenditures. Such devices will be far more costly than particulate control equipment. In some cases, it was shown that the projected capital cost alone for installation of a single control device will exceed the total current $15 million Federal budget for research on the control of sulphur oxides. Defendants' Exhibit 89, Table 5, p. 43; Griswold Dep. 214-16.

The Adverse Effect of Air Pollution Control Devices on Coal Consumption

The lack of commercially acceptable sulphur oxide control devices, coupled with the increasing adoption of stringent sulphur oxide air pollution restrictions, has led to a switch on the part of many fuel consumers away from coal. As Commonwealth Edison summed up the situation in its annual report: "The best way for us to reduce air pollution is to burn less coal." Defendants' Exhibit 90, centerspread. By 1973, Commonwealth Edison will be burning 50 per cent less coal in Chicago than it did in 1967, and by 1975, Edison's coal-burn will be cut in half again.

Defendants' Exhibit 98. During 1969, the gas burned in Commonwealth Edison's plants in and near Chicago replaced nearly 1,700,000 tons of coal. Currently, an additional 1,400,000 tons are being replaced by oil. Low-sulphur coal from Montana, Wyoming, and Colorado is also being tested as a possible substitute for still more of the high-sulphur coal presently consumed by Edison. Finally, Edison has made a substantial commitment to the use of nuclear energy, particularly in its future generation plans. Gorden Corey, Chairman of Commonwealth Edison's Finance Committee, emphasized at trial that "we believe this is the best way to take care of our massive electric power generation problems with a minimum of disturbance to the environment." Corey Tr. pp. 1600-01.

Like Commonwealth Edison, Northern States Power used its annual report to advise its shareholders of the steps it is taking in the face of growing air pollution concern and regulation. The report notes the conversion, for example, of some of its plants from coal burning to gas and oil fuel, and stresses the company's commitment to nuclear energy:

> "* * * By 1974, 35 per cent of the Company's total generating capability will be in nuclear units that do not produce dust or sulphur dioxide. By 1974, NSP will burn about 4 million less tons of coal annually than would have been required if coal-burning units of comparable generating capacity had been built. This is a coal and sulphur dioxide reduction of 55 per cent." Defendants' Exhibit 149, p. 18.

Other industry witnesses also noted the erosion of coal's competitive position because of the increasing concern over air pollution, and their expectation that the competition that coal faces from other fuels would increase even more in the future. As the president of one midwest utility expressed it: "We have always discussed every alternate fuel and looked at it, and we are doing so more in recent years because of air pollution." Steele Tr. p. 956. Indeed, as another utility executive testified: "Air pollution is getting to be the overriding issue." Tomey Tr. p. 397.

Coal producers also stressed the impact of air pollution regulation on coal consumption. The president of one coal company noted, for example, that immediately after the enactment of an air pollution ordinance in St. Louis, his company lost one of its major customers because the company's coal had a higher sulphur content than permitted under the ordinance. Beck Dep. 9.

The capital and operating costs involved in air pollution controls are important economic factors which utilities will consider in determining what type of fuel to burn and what type of generating stations to construct for their system. Such costs may well lead to the exclusion of coal from the competitive picture for some utilities in favor of other fuels. The impact of air pollution abatement measures on the consumption of various fuels by electric utilities was summed up by Dr. Bruce Netschert, defendants' economic and energy exepert, as follows:

"Well, as I previously indicated, I think that the impact of the sulphur aspect of air polution regulations is to place coal at a competitive disadvantage, and this stated otherwise would mean that there would be a tendency to turn to other fuels as a means of coping with such regulations—gas, oil and nuclear.

"To answer your question specifically, I would say that the net effect would be to tend toward an increase in the consumption of these other fuels at the expense of coal consumption." Netschert Dep. 69.

In light of the commercial unavailability of sulphur oxide pollution control equipment, many of the governmental restrictions adopted to date, particularly the more recent, have taken the form of a limitation on the amount of sulphur in fuel burned rather than a limitation of the amount of sulphur oxide emissions. Defendants' Exhibit 89, Table 2, p. 14; Defendants' Exhibit 89, pp. 13, 23; Griswold Dep. 147. Furthermore, because of the time, expense, and difficulties in measuring emissions, practical enforcement of even the latter standards often takes the form of restricting the sulphur content in fuels burned. Coals whose sulphur content exceeds that proscribed by ordinance or statute cannot, of course, compete for the business of consumers located within the area of regulation. *Because of its high sulphur content, none of United Electric's coal can be sold in Chicago.*

Not only does this intense level of interfuel competition explain a great deal of what has happened

in the coal industry and to its markets, but its recognition is necessary to any valid predictions concerning the coal industry's future. Because interfuel competition particularly provides utilities with a strong bargaining weapon in negotiations with coal producers, this competition exerts strong pressure on the market in which coal producers sell their form of energy. This court is of the opinion that these pressures are crucially relevant to its assessment of the competitive effect of the United Electric-Freeman combination.

IV. THE RELEVANT PRODUCT MARKET

Based upon the extensive evidence presented at trial concerning the coal industry, its consumers and its competitors, this court is of the opinion that the energy market is the appropriate line of commerce for testing the competitive effect of the United Electric-Freeman combination. Midwest coal consumers, many of whom testified at trial, were shown to be typically large utility and industrial corporations sophisticated in the energy market. Their testimony consistently demonstrated that their purchasing decisions with respect to coal were based primarily upon a comparison of competitive forms of energy. In the context of the entire record before this court, the Government's position that coal is a "sub-market" for antitrust purposes is untenable. As succinctly stated in *United States* v. *Bethlehem Steel Corp.*, 168 F.Supp. 576, 592 (S.D.N.Y. 1958):

> "* * * Any definition of a line of commerce which ignores the buyers and focuses on what the sellers do, or theoretically can do, is not meaningful."

In determining the appropriate line of commerce, the Supreme Court has directed that economic and commercial realities must be examined. *United States* v. *Continental Can Co.*, 378 U.S. 441, 449 (1964); *Brown Shoe Co., Inc.* v. *United States*, 370 U.S. 294, 336 (1962). If competition cuts across product or industry lines, the product market must be drawn broadly enough to include competition as it exists. In the *Continental Can* decision, the Supreme Court observed that:

> "It is quite true that glass and metal containers have different characteristics which may disqualify one or the other, at least in their present form, from this or that particular use; that the machinery necessary to pack in glass is different from that employed when cans are used; that a particular user of cans or glass may pack in only one or the other container and does not shift back and forth from day to day as price and other factors might make desirable; and that the competition between metal and glass containers is different from the competition between the can companies themselves or between the products of the different glass companies. These are relevant and important considerations but they are not sufficient to obscure the competitive relationships which this record so compellingly reveals." 378 U.S. at 450. (Emphasis supplied)

The competitive battle waged by various forms of energy, as documented in this litigation, is similar to the demonstrated competition between glass and metal containers in the *Continental Can* decision. Applicable here are the Supreme Court's considerations which compelled the conclusion that an inter-industry line of commerce existed:

> "* * * In our view there is and has been a rather general confrontation between metal and glass containers and competition between them for the same end uses which is insistent, continuous, effective and quantitywise very substantial. Metal has replaced glass and glass has replaced metal as the leading container for some important uses; both are used for other purposes; each is trying to expand its share of the market at the expense of the other; and each is attempting to preempt for itself every use for which its product is physically suitable, even though some such uses have traditionally been regarded as the exclusive domain of the competing industry." *Id.* at 453.

These considerations also compel this court to conclude that since coal competes with gas, oil, uranium and other forms of energy, the relevant line of commerce must encompass interfuel competition.[33]

---

[33] In United States v. Aluminum Co. of America, 377 U.S. 271 (1964), and United States v. Philadelphia National Bank, 374 U.S. 321 (1963), decisions heavily relied upon by the Government in this action, the Supreme Court found that the requisite interproduct competition was not supported by the record. Such is not the case here.

V. THE RELEVANT GEOGRAPHICAL MARKET

The defendants have presented extensive evidence showing the distributive patterns of all the coal from the United Electric mines and other mines located in the same Freight Rate Districts. A similar showing has been made with respect to Freeman's mines and the Freight Rate Districts where they are located. The sales markets thus revealed were then analyzed to determine the likely effect of the United Electric-Freeman combination upon each of them.

The Government's proposed geographic markets, Illinois and the Eastern Interior Coal Province, are based essentially on past and present production statistics and do not relate to actual coal consumption patterns. The Government failed to produce evidence to establish the existence of a market for coal within these two proffered geographic areas. The Government's own economist testified that he had "concluded that the State of Illinois was the most appropriate market" without explaining why. Folsom Tr. p. 2469. Moreover on cross examination he could name no other factor that made the political boundaries of the State of Illinois a meaningful measure of the relevant geographic market for coal. Folsom Tr. p. 2501. There is no evidence in this record that any customer of either United Electric or Freeman purchased, or that any producer sold, coal throughout either of the Government's proposed markets. In sharp contrast with the Government's approach, the defendants' proposed markets reflect distribution pat-

terns shown by the evidence as recognized by the coal industry and the Interstate Commerce Commission, as well as by the Supreme Court. Terleke Dep. Ex. 1-11; Weir Dep. Ex. 1; Nugent Dep. Ex. 38; *Ayrshire Collieries Corp.* v. *United States, supra.*

The evidence clearly indicates that transportation costs largely determine those facilities for whose business coal mines are able to compete and those mines to which coal consumers can practicably turn for supplies. As the president of one midwest coal producer testified, "coal sales follow transportation arteries and freight rates." Beck Dep. 7. It is undisputed that the cost of transporting coal may approach 30 per cent to 40 per cent of its delivered price, and is therefore a critical factor influencing the choice of suppliers by coal consumers which can effectively segregate coal producers in one area from those in another. The evidence shows that in maps and statistical compilations used by midwest coal consumers and producers, mines located in Illinois, Indiana and western Kentucky have long been commonly grouped according to the Freight Rate Districts in which they are located. Responses to the subpoena questionnaire sent to midwest coal consumers demonstrated that each Freight Rate District serves a distinct and definable area, as did the testimony of producers and consumers.

The defendants have also identified two unique coal consumers for purposes of market delineation. Commonwealth Edison annually consumes as much coal as the combined production of all the mines in both

the Fulton-Peoria and the Springfield Freight Rate Districts, the two major Freight Rate Districts closest to its generating stations. Because of its substantial coal requirements and the location of its facilities, Commonwealth Edison must purchase coal from several Freight Rate Districts in Illinois. Moreover, in order to minimize its overall transportation costs, Commonwealth Edison has a distribution pattern for the coal which it purchases that is quite distinct from that followed by other consumers. Finally, Commonwealth Edison has the most extensive commitment to the use of nuclear energy for the generation of electricity of any electric utility in the world and has also undertaken an air pollution control program which is substantially increasing its use of nuclear energy, gas and oil.

The defendants also substantiated their contention that the Metropolitan Chicago Interstate Air Quality Control Region constitutes another unique coal market. This region, designated by Congress, consists of McHenry, Kane, Lake, Cook, DuPage and Will counties in Illinois, and Lake and Porter counties in Indiana. The City of Chicago, by far the largest municipality within this region, has already enacted air pollution control regulations which prohibit the burning of fuels with a sulphur content of greater than 2.0 per cent at the present, and 1.0 per cent after August 31, 1972. Chicago Municipal Code, Chapter 17, ¶ 17-2.5(3), as amended.

The Chicago area, because it is a major transportation hub with direct railroad or water arteries to

most of the Freight Rate Districts in the midwest, has been served in the past by producers in most midwest Freight Rate Districts. In no other significant industrial and population center in the midwest does this confluence of coal shipments from multiple Freight Rate Districts occur. Because of existing and anticipated air pollution regulations, however, the evidence discloses that future competition will be limited to those producers of low sulphur coal in the Southern Illinois Freight Rate District and in the Murdock Freight Rate District.

Just as the relevant product market must reflect commercial realities, so also must the geographic market selected for testing the competitive effects of an acquisition or merger " 'correspond to the commercial realities' of the industry" under scrutiny. *Brown Shoe Co.* v. *United States, supra,* at 336. See also *Case-Swayne Co.* v. *Sunkist Growers, Inc.,* 369 F.2d 449, 456 (9th Cir. 1966), *rev'd* on other grounds, 389 U.S. 384 (1967); *United States* v. *Northwest Industries, Inc.,* 301 F.Supp. 1066, 1083-84 (N.D. Ill. 1969); *United States* v. *Tidewater Marine Service, Inc.,* 284 F.Supp. 324, 332 (E.D. La. 1968); *United States* v. *Crocker-Anglo National Bank,* 277 F.Supp. 133, 173 (N.D. Cal. 1967); *United States* v. *Kimberly-Clark Corp.,* 264 F.Supp. 439, 457 (N.D. Cal. 1967). The Government's purely statistical approach to geographic market definition fails to measure market strength or competition as it exists. However, even were this court to accept the Government's commercially unrealistic definition of the rele-

vant geographic market, the Government's failure to show that a substantial lessening of competition resulted from the United Electric-Freeman combination is fatal to this divestiture action. *Cf.*, *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, 549-50 (1966).

VI. THE COMPETITIVE EFFECT OF THE UNITED ELECTRIC-FREEMAN COMBINATION

The record indicates an absolute decline in the number of coal producers in Illinois since 1959, as well as in the three-state area proposed by the Government as the relevant geographic market. However, the evidence clearly discloses that reduction in the number of coal producers has occurred not because small producers have been acquired by others, but as the inevitable result of the change in the nature of demand for coal. *Significantly, the United Electric-Freeman combination accounted for less of the coal produced in Illinois and the three-state area in 1967 than it did in 1959.* Accordingly, this litigation presents a very different situation from that in such cases as *United States* v. *Philadelphia National Bank*, 374 U.S. 321 (1963), and *United States* v. *Von's Grocery Co.*, 384 U.S. 270 (1966), where the Supreme Court was concerned with "preventing even slight increases in concentration." 374 U.S. at 365, n.2. Here, there is no element of "prevention," since the combination is in its second decade without demonstrating any of the indicia of concentration.

Crucial to the Government's case is proof that United Electric and Freeman are actual or potential competitors. By the use of charts, the Government points to certain common customers of United Electric and Freeman to demonstrate the requisite anticompetitive effect of the combination of these two coal producers. However, viewed in the context of all the evidence in this case, this court is of the opinion that an independent United Electric would not and could not compete with Freeman to any substantial degree.

These companies have been and are now predominantly complementary in nature. United Electric is a strip mining company with no experience in deep mining nor likelihood of acquiring it. Freeman is a deep mining company with no experience or expertise in strip mining. According to the undisputed evidence, United Electric and Freeman have made a joint proposal to a group of public utilities for development of coal lands in southern Utah. If accepted, United Electric would mine the strip coal and Freeman the deep coal. As Thomas J. Tarzy, United Electric's Vice President of Western Operations testified:

> "It is logical, and I think it made a good proposal, and I think it was well received that here were two companies, one who had expertise in strip mining and the other who had expertise in deep mining, to go in there and make a proposal to develop this property. I think it had a very beneficial effect, and without something like that,

I don't think we would have gotten much consideration." Tarzy Dep. 425.

Freeman sells metallurgical coal. United Electric does not and cannot. The Government concedes that United Electric could not compete with Freeman's sales of metallurgical coal. Freeman sells a by-product known as dust. United Electric does not and cannot.

Excluding Commonwealth Edison, none of the sales by United Electric in the period 1965 to 1967, the years chosen by the Government for analysis, would have or could have been competitive with Freeman, had the two companies been independent. The mines and coal reserves of United Electric are, and have been since prior to 1959, located in different Freight Rate Districts than the mines and coal reserves of Freeman. The Freight Rate Districts in which the mines and reserves of United Electric are located serve separate and distinct markets from those in which the mines of Freeman are located.

Freeman produces coal with a sulphur content within the low limits permitted under local and federal air pollution regulations applicable to the Chicago area, and will likely be able to continue to serve that market. United Electric does not and cannot produce such coal, and thus will not be able to serve that market.

United Electric's contract with Commonwealth Edison, both its and Freeman's largest customer, expired in 1970 and was not renewed. United Electric's sales to Wisconsin Public Service and TVA were shown

to be complementary to those of Freeman and could not have been competitive, even if the companies had been independent.

In 1965, the reserves at the Mary Moore mine of United Electric played out earlier than anticipated, before United Electric's long-term contract with Illinois Power Company for coal from that mine had expired. Freeman stepped in and supplied coal from its Orient mines for the balance of the contract. *United Electric's existing contracts with Central Illinois Light Company, Northern States Power, and Union Electric are backed up by the reserves of Freeman and could not have been obtained without that guarantee.*

Moreover, United Electric's coal reserve prospects for the future are singularly unpromising. Evidence was presented at trial by experts, by state officials, by industry witnesses and by the Government itself indicating that economically mineable strip reserves that would permit United Electric to continue operations beyond the life of its present mines are not available. The Government failed to come forward with any evidence that such reserves are *presently* available. The evidence conclusively shows the critical importance of coal reserves to the successful negotiation of long term contracts with utilities. United Electric can hardly be considered a competitive force in the utilities market without sufficient reserves.

The adequacy of crucial resources is one of the factors which should be considered in assessing the likely competitive effect of a merger. *Brown Shoe*

Co. v. *United States*, 370 U.S. 294, 346 (1962). See also *United States* v. *Pennzoil Co.*, 252 F.Supp. 962, 979 (W.D. Pa. 1965); *United States* v. *Atlantic Richfield Co.*, 297 F.Supp. 1060 (S.D.N.Y. 1969). In view of the evidence presented on this issue, this court is of the opinion that United Electric, standing alone, cannot contribute meaningfully to competition. This factor persuasively confirms the cumulative testimony of consumers and competing producers that the United Electric-Freeman combination does not adversely affect competition.

SUMMARY AND ORDERS

The evidence presented by both parties in this divestiture action fails to support the Government's contention that the effect of the United Electric-Freeman combination has been or will likely cause a substantial lessening of competition. The challenged combination has been in effect since 1959, and yet no adverse consequences with respect to competition were shown either to have occurred or likely to occur. Particularly significant is the fact that for coal producers such as United Electric and Freeman, the utility market has become, and will undoubtedly remain, the only substantial outlet for coal production. Moreover, in the utility market, producers such as United Electric and Freeman face sophisticated, knowledgeable purchasers wielding great economic power and having formidable bargaining strength. Intense interfuel competition gives utilities and other

coal purchasers additional bargaining strength and places great pressure upon coal producers to remain competitive.

The increasing concern with air pollution problems will adversely affect coal producers, particularly high-sulphur coal producers such as United Electric, thereby imposing upon them a serious competitive disadvantage in their rivalry with other fuels.

The evidence supports the defendants' contention that United Electric and Freeman are predominantly complementary rather than competitive producers. The only evidence produced by the Government to support their claim of a substantial lessening of competition was statistics which fail to reflect the very real competition coal faces from other forms of energy, and which groups together coal producers into economically unrealistic markets while ignoring the key factor in a coal producer's market strength—coal reserves. Furthermore, evidence from numerous knowledgeable industry representatives, including competitors and customers of United Electric and Freeman, confirms the defendants' contention that the challenged combination has not led, and is not likely to lead to a substantial lessening of competition.

Finally, virtually all of the economically mineable strip reserves of United Electric have been sold under long-term contracts, and United Electric has neither the possibility of acquiring more nor the ability to develop deep coal reserves. Under these circumstances, continuation of the affiliation between United

Electric and Freeman is not adverse to competition, nor would divestiture benefit competition even were this court to accept the Government's unrealistic product and geographic market definitions. This court concludes that, upon the basis of reliable, probative and substantial evidence contained in the record, the challenged acquisition does not violate Section 7 of the Clatyon Act.

IT IS THEREFORE ORDERED that judgment be, and it is hereby rendered for the defendants.

IT IS FURTHER ORDERED that the complaint be, and it is hereby dismissed.

IT IS FURTHER ORDERED that costs be assessed against the plaintiff.

ENTER:

/s/ Edwin A. Robson
Chief Judge

April 13, 1972

APPENDIX B

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Civil Action No. 67 C 1632

[Filed June 7, 1972]

UNITED STATES OF AMERICA, PLAINTIFF

v.

GENERAL DYNAMICS CORPORATION, ET AL.,
DEFENDANTS

NOTICE OF APPEAL TO THE SUPREME COURT OF THE UNITED STATES BY THE UNITED STATES OF AMERICA

Notice is hereby given that the United States of America, plaintiff herein, appeals to the Supreme Court of the United States from the judgment entered April 13, 1972, dismissing the complaint in this action. Appeal is taken pursuant to the Expediting Act of February 11, 1903, 15 U.S.C. 29.

/s/ John E. Sarbaugh
JOHN E. SARBAUGH

/s/ Howard E. Shapiro
HOWARD E. SHAPIRO
Attorneys
Department of Justice

CERTIFICATE OF SERVICE

I hereby certify that on this 7th day of June, 1972, I served a true copy of the foregoing Notice of Appeal on

Reuben L. Hedlund
Kirkland & Ellis
2900 Prudential Plaza
Chicago, Illinois 60601

by first class mail, postage prepaid.

/s/ John E. Sarbaugh
JOHN E. SARBAUGH
Attorney

☆ U. S. GOVERNMENT PRINTING OFFICE: 1972 475403 124

Supreme Court, U. S.
FILED
OCT 10 1972
MICHAEL RODAK, JR., CLERK

No. 72-402

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1972

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

MOTION TO AFFIRM

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
2900 Prudential Plaza
Chicago, Illinois 60601

KIRKLAND & ELLIS
Chicago, Illinois

ALBERT E. JENNER, JR.
Room 3300
135 So. La Salle St.
Chicago, Illinois 60603

JENNER & BLOCK
Chicago, Illinois

Of Counsel

Attorneys for Defendants

October 10, 1972

La Salle Street Press—Chicago/PrinterLink

INDEX

	PAGE
MOTION TO AFFIRM	1
ARGUMENT	2
I. THE DECISION BELOW IS CLEARLY CORRECT	4
II. THE MARKET DEFINITIONS ADOPTED RAISE NO SUBSTANTIAL QUESTIONS	10
A. The Decision Below Did Not Turn On The Subsidiary Questions Of Market Definition	10
B. The Market Definitions Adopted Do Not Require Review By This Court	15
The Product Market	15
The Geographic Markets	19
III. THE COURT'S CONCLUSIONS WITH RESPECT TO UNITED ELECTRIC'S LACK OF COMPETITIVE POTENTIAL WERE CORRECT AND SUPPORTED BY SUBSTANTIAL EVIDENCE	24
Industry Field and Round Prairie	24
The Argument That United Electric's Competitive Potential Was "Cut Off" Has No Merit	29
CONCLUSION	35

CITATIONS

Cases

	PAGE
Ayrshire Collieries Corp. v. *United States*, 335 U.S. 573 (1949)	20
Brown Shoe Co. v. *United States*, 370 U.S. 294 (1962)	10, 12, 17, 23
Federal Power Commission v. *Hope Natural Gas Co.*, 320 U.S. 591 (1944)	16
Fuels Research Council, Inc. v. *Federal Power Commission*, 374 F.2d 842 (7th Cir. 1967)	16
International Shoe Co. v. *Federal Trade Commission*, 280 U.S. 291 (1930)	8
Kennecott Copper Corp. v. *Federal Trade Commission*, 5 Trade Reg. Rep. (1972 Trade Cas.) 74,157 (10th Cir.)	11, 18, 19, 22, 23, 28
Mississippi River Transmission Corp. and United Gas Pipe Line Co., 41 FPC 555 (1969)	16
National Coal Association v. *Federal Power Commission*, 247 F. 2d 86 (D.C. Cir. 1957)	16
Natural Gas Pipeline Co. of America v. *New York Central R.R. Co.*, 323 ICC 75 (1964)	16
Natural Gas Pipeline Co. of America, 28 FPC 731 (1962)	16
Reynolds Metals Co. v. *Federal Trade Commission*, 309 F.2d 223 (D.C. Cir. 1962)	17
Tampa Electric Co. v. *Nashville Coal Co.*, 276 F.2d 766 (6th Cir. 1960), *rev'd* 365 U.S. 320 (1961)	16
United States v. *Borden Co.*, 370 U.S. 460 (1962)	23
United States v. *Columbia Pictures Corp.*, 189 F. Supp. 153 (S.D. N.Y. 1960)	6
United States v. *E. I. duPont deNemours*, 353 U.S. 586 (1957)	3

PAGE

United States v. *First Nat'l Bank of Md.*, 310 F. Supp. 157 (D. Md. 1970) 6, 12

United States v. *Ling-Temco Electronics, Inc.*, 1961 Trade Cas. 78,621 (N.D. Tex. 1961) 6

United States v. *Nat'l Steel Corp.*, 1965 Trade Cas. 80,604 (S.D. Tex. 1965) 6

United States v. *Pabst Brewing Co.*, 384 U.S. 546 (1966) 5, 6, 11, 22

United States v. *Pabst Brewing Co.*, 233 F. Supp. 457 (E.D. Wisc. 1964) *rev'd* 384 U.S. 546 (1966) 9

United States v. *Peabody Coal Co.*, 1967 Trade Cas. 84,376 (N.D. Ill.) 12

United States v. *Philadelphia Nat'l Bank*, 374 U.S. 321 (1963) 6, 8

United States v. *Singer Manufacturing Co.*, 374 U.S. 174 (1963) 23

United States v. *Standard Oil Co. (New Jersey)*, 253 F. Supp. 196 (D.N.J. 1966) 28

United States v. *Tidewater Marine Service, Inc.*, 284 F. Supp. 324 (E.D. La. 1968) 6

United States v. *United States Steel Corp.*, 251 U.S. 417 (1920) 8, 9

United States v. *Von's Grocery Co.*, 384 U.S. 270 (1966) 5, 6

Miscellaneous

FEDERAL TRADE COMMISSION STAFF REPORT, INTERFUEL SUBSTITUTABILITY IN THE ELECTRIC UTILITY SECTOR OF THE U.S. ECONOMY (1972) 15

JAMES MELLVILLE, AUTOBIOGRAPHY (1583) 22

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1972

No. 72-402

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

F.I.d 10/10/72

MOTION TO AFFIRM

General Dynamics Corporation, The United Electric Coal Companies, and Freeman Coal Mining Corporation move pursuant to Rule 16 of this Court that the judgment of the District Court be affirmed. It is manifest that the decision below is correct and the questions of which review is sought are unsubstantial.

ARGUMENT

The District Court held that, "upon the basis of reliable, probative and substantial evidence contained in the record," the longstanding affiliation of The United Electric Coal Companies and Freeman Coal Mining Corporation does not violate Section 7 of the Clayton Act. (App. 66a.)[1] Chief Judge Robson concluded that "[t]he challenged combination has been in effect since 1959, and yet no adverse consequences with respect to competition were shown either to have occurred or likely to occur." (App. 2a, 64a.)

The decision below is singularly appropriate for summary affirmance.

First, the determination that the challenged combination does not violate Section 7 turned on a host of disputed and complex factual issues, each of which was resolved squarely against the government on the basis of abundant evidence. Second, resolution of the subsidiary questions of market definition was not critical to the decision, the Court stressing that no violation of Section 7 would be found "even were this court to accept the Government's unrealistic product and geographic market definitions." (App. 66a.) Third, the opinion involves no novel questions of law nor departure from precedent, nor does it raise substantial questions concerning proper criteria for assessing anticompetitive effects in Section 7 cases. Finally, there is no escaping the overwhelming record evidence that virtually all of the economically mineable strip reserves of United Elec-

[1] "J.S." references are to the Jurisdictional Statement, and "App." references are to the opinion of the District Court as set forth in Appendix A thereto. "DX" references are to defendants' exhibits; "GX" references are to government exhibits; ".... Tr." references are to the trial transcript; and ".... Dep." references are to depositions. "DPF" references are to the defendants' post-trial proposed findings of fact. Except where otherwise noted, emphasis has been supplied throughout.

tric have been sold under long-term contracts, that United Electric has neither the possibility of acquiring more nor the ability to develop deep coal reserves, and, therefore, an independent United Electric cannot contribute meaningfully to competition. The government's contrived argument that the District Court measured United Electric's competitive potential at the wrong time misreads the opinion and ignores the record.

The record demonstrates that the outcome of this litigation is totally without competitive significance. In 1960, when the Antitrust Division, learning of the combination, took no action, the United Electric-Freeman affiliation was already six years old and had been publicly disclosed since its inception. A dozen more years have now passed. In the interim, the utility industry—sophisticated, knowledgeable purchasers wielding great economic power and having formidable bargaining strength—has emerged as the only substantial market for coal production. The intervening years have also seen interfuel competition, stringent air pollution controls and anti-strip mining legislation add a new dimension to the already intense competitive struggle to serve this market. And while United Electric operated six mines when its affiliation with Freeman began, today it operates but three; these have short remaining lives and their coal has all been sold. Far from threatening "to ripen into a prohibited effect,"[2] this longstanding affiliation never has, does not now, and never can threaten competition. The government, despite a diligent search, was unable to find a single competitor or customer who thought otherwise. Under these circumstances, and particularly in view of the fact that United Electric's terminal condition is as irreversible as it was inevitable, this case poses no issues of concern

[2] *United States* v. *E.I. duPont deNemours*, 353 U.S. 586, 597 (1957).

to anyone, save the defendants. Accordingly, the Court should not be compelled to assume the burden entailed in a plenary review, and the decision below should be summarily affirmed.

I.

THE DECISION BELOW IS CLEARLY CORRECT

On the basis of two and a half years of pretrial discovery, a month-long trial, and the submission by both sides of extensive proposed findings, briefs and replies, the District Court reached the conclusion "that the challenged combination has not led, and is not likely to lead to a substantial lessening of competition." (App. 65a.) It did so only after determining a wide range of *factual* issues concerning the economic and commercial realities which provide the setting for such a competitive assessment: the history, mines, production, reserves and capabilities of the companies whose affiliation was challenged; the history, structure, nature and dynamics of the coal industry, its products and its markets; the distribution patterns for coal; the competition which a coal producer faces from other coal producers and from suppliers of alternative fuels; the nature of coal consumers, their buying practices and bargaining strength; the characteristics, location and availability of coal reserves; and a host of other details bearing on the past and likely future effect on competition of the United Electric-Freeman combination.

The "massive quantity of evidence" (App. 2a) supporting these factual determinations included more than 10,000 pages of exhibits and more than 7,500 pages of testimony by consumers[3] and competitors, by government officials, defend-

[3] As was stated in the Government's Response to Defendant's Proposed Findings (at page 225): "The Government admits that there is testimony in the record concerning the competitive implications of this acquisition from large, medium size and small public utilities, a rural electric cooperative, federal electric authority, a retail coal dealer and several industrial concerns."

ants, experts, trade association executives, and by others. In addition, a wealth of stipulated statistical evidence was introduced into the record, including the results of a court-ordered subpoena questionnaire issued to coal producers and consumers throughout the midwest. The results of this survey constituted a census with respect to such matters as coal characteristics, coal distribution patterns, coal reserves, interfuel competition and the characteristics and capabilities of virtually every strip and deep mine in the midwest.

What emerged from this expansive record is an articulate and reasoned opinion. The numerous factual predicates for the court's conclusion that the merger had no past or prospective anticompetitive effect are clearly spelled out in detail in the District Court's opinion and are summarized below.

1. As the government recognizes (J.S. 4), the utility market has become the only substantial outlet for coal production for coal producers such as United Electric and Freeman. In that market, these companies face sophisticated, knowledgeable purchasers wielding great economic power and having formidable bargaining strength. So indisputable is this fact that the government conceded that utilities have *at least* "equal bargaining power" with coal producers in the midwest. (App. 27a.)[4] This presented, of course, a radically different consumer situation from that involved in such cases as *United States* v. *Von's Grocery Co.*, 384 U.S. 270 (1966) and *United States* v. *Pabst Brewing Co.*, 384 U.S. 546 (1966).

2. Moreover, intense interfuel competition gives utilities and other coal purchasers additional leverage and places

[4] See Government's Proposed Findings, § VI, C(9) at p. 25.

great pressure upon coal producers to remain competitive. (App. 26a-27a, 64a-65a.) This competitive pressure will further intensify as technological progress continues and as environmental concern imposes serious disadvantages on coal in its rivalry with other fuels. (App. 14a, 33a-34a, 37a-40a, 42a-43a, 52a, 65a.) Indeed, so serious has this latter concern become that none of United Electric's coal can be sold in Chicago. (App. 52a, 62a.)

3. It was also found with respect to the coal industry that there had been intense competition among coal producers in the past which was likely to increase in the future. (App. 18a.) See *United States* v. *First Nat'l Bank of Md.*, 310 F.Supp. 157, 175 (D.Md. 1970); *United States* v. *Tidewater Marine Service, Inc.*, 284 F.Supp. 324, 339 (E.D.La. 1968); *United States* v. *Nat'l Steel Corp.*, 1965 Trade Cas. 80,604, 80,610 (S.D. Tex. 1965); *United States* v. *Ling-Temco Electronics, Inc.*, 1961 Trade Cas. 78,621, 78,639 (N.D. Tex. 1961); *United States* v. *Columbia Pictures Corp.*, 189 F.Supp. 153, 196, 202 (S.D. N.Y. 1960).

4. The increase in the size of coal mining companies, the increase in the size of mines and the reduction in the number of coal producers were found to have occurred, not because small producers had been acquired by others but as the inevitable result of the change in the nature of demand for coal. This took place as the railroad, space heating and retail markets were lost to other fuels and as utilities shifted to long-term, large-scale contracts. (App. 18a, 24a, 60a.) Significantly, the government's economist at trial agreed. (Folsom Tr. 2581.) As the testimony of a number of witnesses demonstrated, small coal producers were, for all practical purposes, in a "different business." (App. 17a.) Again, this markedly distinguished the coal industry from the business of the defendants in *Von's*, *Pabst* and *United States* v. *Philadelphia Nat'l Bank*, 374 U.S. 321 (1963).

5. The government's theory of the case was that the United Electric-Freeman combination was "an ordinary horizontal acquisition." (J.S. 9.) Accordingly, and as the court below found, crucial to the government's case was proof that United Electric and Freeman were actual or potential competitors. The evidence was, however, that an independent United Electric would not and could not compete with Freeman to any substantial degree. (App. 61a.) On the basis of testimony before the Court, it was found that none of the actual sales by United Electric in the period 1965 to 1967, the years chosen *by the government* for analysis, could have been competitive, excluding Commonwealth Edison. On the basis of stipulated data[5] and corroborative testimony, the court concluded that the Freight Rate Districts in which the mines and reserves of United Electric had been located since prior to 1959 served separate and distinct markets from those in which the mines and reserves of Freeman had been located. This lack of competitive overlap was confirmed by officials of the Tennessee Valley Authority, Union Electric Company, Dairyland Power Company, Central Illinois Light Company, Illinois Power Company, Wisconsin Public Service, Wisconsin Electric Power, Northern States Power, Electric Energy and Interstate Power Company, all major customers of United Electric or Freeman, as well as by the testimony of government officials, defendants and other coal producers and consumers.[6]

6. As confirmed by the testimony of one of its principal officers,[7] Commonwealth Edison — United Electric's and Freeman's largest customer and Illinois' largest coal con-

[5] DPF 316-320, 323-327, 330-334, 337-342, which set forth this data, were admitted by the government.

[6] See DPF 288-296, 315, 322, 329, 336, 344, 348-356.

[7] Gordon Corey, Finance Committee Chairman, had ultimate authority for Edison's coal purchases. (Corey Tr. 1580-81.)

sumer—was shown to be unaffected by the merger. (Corey Tr. 1611-13.) The evidence was that it must purchase coal from several Freight Rate Districts because of its substantial coal requirements and location of facilities. It was found to have the most extensive commitment to the use of nuclear energy for the generation of electricity of any electric utility in the world and was substantially increasing its use of gas and oil. (App. 62a, 33a, 58a.)[8] In any event, United Electric's contract with Edison expired in 1970 and was not renewed because of United's lack of reserves and Edison's low sulphur coal program. (App. 62a; see also Corey Tr. 1658-59.)

7. The "knowledgeable" record testimony of every other utility and coal consumer supported the defendants' contention that the merger had not led and was not likely to lead to a substantial lessening of competition. (App. 64a-65a). This testimony, subjected to Government cross-examination, was supplied in part by representatives of utilities accounting for the purchase of *more than 60 percent of the coal produced in the midwest for the generation of electricity*. Such testimony has significant probative value when it is reasoned and based on facts, and when it is given by knowledgeable witnesses who spell out the concrete reasons for their conclusions.[9] *United States* v. *Philadelphia Nat'l Bank*, 374 U.S. 321, 367 (1963); *International Shoe Co.* v.

[8] Recognizing the force of these facts, the government hastened to assure the court that Commonwealth Edison does not possess an "unfair advantage" over midwestern coal producers. (See Government's Proposed Findings, § VI, ¶ C(9) at p. 25.)

[9] The government's lone effort to establish that such witnesses were indifferent to, and unsophisticated concerning, the competitive implications of mergers among coal producers was made during the cross-examination of A. H. Davis, the president of Central Illinois Light Company. This elicited the fact that Mr. Davis had, in the past, taken the initiative in complaining to the Department of Justice when his evaluation led him to conclude that another merger between two coal producers *did* pose a threat to competition. (Davis Tr. 753-54.)

Federal Trade Commission, 280 U.S. 291, 299 (1930); *United States* v. *United States Steel Corp.*, 251 U.S. 417, 451 (1920). As the government has observed in other cases, such testimony "is an invaluable and time honored mode of evidence in antitrust cases where the effect on competition is in issue." See *United States* v. *Pabst Brewing Co.*, 233 F.Supp. 475, 478-79 (E.D. Wisc. 1964), *rev'd* 384 U.S. 546 (1966).

8. Finally, the evidence showed that an independent United Electric could not contribute meaningfully to competition. (App. 64a.) It was proven at trial, and is not now disputed by the government, that control of sufficient coal reserves is of critical importance to the successful negotiation of long-term contracts with utilities. (App. 63a.) However, virtually all of the economically mineable strip reserves of United Electric were shown to have been sold under long-term contracts, and the evidence was that United Electric had neither the possibility of acquiring more nor the ability to develop deep coal reserves. (App. 65a.) On the basis of reports and testimony adduced by defendants from geologists, coal consumers and producers, government officials and the government's own rebuttal witnesses (see DPF 386-430), Chief Judge Robson decided these purely fact questions solidly in defendants' favor. In view of the extensive and reliable supporting evidence in this record, it is inconceivable that a plenary review would reveal these findings clearly erroneous.

The government's trial economist on three occasions during his testimony ventured his opinion that, given these facts, continuation of the United Electric-Freeman combination would not be adverse to competition and United Electric, if divested, would not be a viable competitive force. (Folsom Tr. 2584, 2599, 2621.) The court below was compelled to agree.

In sum, the case was tried and decided on the basis of particular facts found, in weighing all of the evidence, against the government. Neither novel theory nor break with precedent was required to reach the obvious conclusion that the merger did not violate Section 7. Since it is so clearly correct, that determination should be summarily affirmed.

II.

THE MARKET DEFINITIONS ADOPTED RAISE NO SUBSTANTIAL QUESTIONS.

A. The Decision Below Did Not Turn On The Subsidiary Questions of Market Definition.

As is clear from its opinion, the District Court's resolution of the subsidiary questions of market definition were not determinative of the ultimate issues in this case. Therefore, the questions raised by the government concerning the court's choice of product and geographic market are not material.

This Court has made it clear that in an action under Section 7 an "examination of the particular market—its structure, history and probable future" is necessary to "provide the appropriate setting for judging the probable anticompetitive effect of the merger." *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 322 n. 38 (1962). It was on the basis of precisely such an examination, involving a careful assessment of "*all* of the evidence" (App. 2a, 18a, 53a, 64a, 66a), that the District Court concluded that the challenged combination did not offend Section 7.

Significantly, not one of the many factors considered by the court in reaching its decision, as we have discussed above, hinged upon resolution of the questions of market definition. These questions were thus in no sense critical to the outcome, and the court specifically held that the United

Electric-Freeman affiliation would not violate Section 7 "even were this court to accept the Government's unrealistic product and geographic market definitions." (App. 66a; see also App. 59a-60a.) The court stated (App. 60a) that in so holding it was mindful of this Court's teaching in *Pabst* that questions of market definition are "entirely subsidiary to the crucial question in this and every § 7 case which is whether a merger may substantially lessen competition." *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, 549-50 (1966).

Thus, the District Court did not use the relevant product and geographic markets which it adopted as the key to the denominator for a simplistic mathematical test. To the contrary, it rejected any such mechanistic approach and focused instead on the "crucial question" of the combination's competitive effects.

Accordingly, the trial court's choice of energy rather than coal as the appropriate *product* market *was not* the predicate for a finding that the challenged combination supplied an insubstantial share of energy resources consumed in the midwest. It was designed instead to make it clear that the court had given full recognition to the intense competitive pressures from alternative fuels which, the court concluded on the basis of substantial evidence (see App. 27a-53a), were "crucially relevant to its assessment of the competitive effect of the United Electric-Freeman combination." (App. 53a)[10]

[10] There is, of course, no real distinction between this approach and that of the 10th Circuit in the recently decided *Kennecott* case. Thus, while the court there found *coal* to be the appropriate line of commerce, it nonetheless recognized the importance of considering interfuel competition: "The examiner's determination that nuclear energy and natural gas competition should be considered was largely based on the competition which is shown to exist in the generation of electrical energy by utility companies, and unquestionably in this area of economic activity coal is in direct competi-

Neither was the District Court's *geographic* market definition a prelude to an exculpating finding of permissible market share. Rather, it was intended to facilitate an appreciation of the fact that the only coal markets which had or could be served by Freeman and United Electric were the respective sales areas of the ICC-designated Freight Rate Districts wherein their mines were located, the facilities of Commonwealth Edison and facilities located in the Chicago area. If the combination had had or might have an anti-competitive effect, it would be in those areas. (App. 57a-59a, 62a.)

In the end then, the court's product and geographic markets were chosen not to foreclose examination of the *coal* industry in the *midwest*, but rather because they helped to "explain a great deal of what has happened in the *coal* industry and to *its markets*." (App. 52a-53a; see also App. 57a-59a.) The District Court gave careful consideration, for example, to the decline in number of midwest coal producers. As has been discussed above (*supra*, p. 6), it found that these small producers had not been acquired by others but had disappeared *as the direct result of inter-fuel competition*. (App. 18a, 60a.)[11]

---

tion with other fuels, and so it seems reasonable to consider as did the examiner the competition that exists between coal and other fuels, at least in the mentioned context." *Kennecott Copper Corp.* v. *Federal Trade Commission*, 5 Trade Reg. Rep. (1972 Trade Cas.) ¶ 74,157 at 92,834 (10th Cir.). See also *United States* v. *First Nat'l Bank of Md.*, 310 F.Supp. 157, 168 (D.Md. 1970).

[11] Similarly, the government's protestations about a "pronounced trend toward concentration" (J.S. 20) simply will not square with the trial record. The evidence was that, apart from Peabody Coal Company, the share of production accounted for by the two, four and ten largest producers had since 1959 either remained stable or, in some cases, declined. Presumably, the competitive implications of the growth in the share of midwest coal production accounted for by Peabody have been rectified to the satisfaction of the government by the consent decree in *United States* v. *Peabody Coal Co.*, 1967 Trade Cas. 84,376 (N.D. Ill.). See also GX 64, 72, 77,

In contrast to the "pragmatic, factual approach"[12] of the District Court, the government's "purely statistical approach" failed "to measure market strength or competition as it exists." (App. 59a.) Not only did the government's statistics "fail to reflect the very real competition coal faces from other forms of energy" and group "together coal producers into economically unrealistic markets," but they also ignored completely "the key factor in a coal producer's market strength—coal reserves." (App. 65a.)[13] Just how deficient the government's statistics were in light of the latter infirmity may be seen from the fact that although Humble Oil is estimated to control three and one quarter billion tons of deep coal reserves in the midwest (DX 61), it was not even listed as a competitor by the government because its initial mine had not yet come on stream and it thus had not yet started reporting production data.

The inadequacy of the government's approach to the case at bar was further demonstrated by the government's actions during the effecting of the consent decree in the *Peabody* case (*supra*, note 11). The Antitrust Division went on record there (DX 37) that it would approve "without reservation" a merger of the Midland operation (which Peabody had consented to sell) and Zeigler Coal and Coke

---

85; DX 84, 237; Steiner Tr. 2230-43. As for the combined United Electric-Freeman, the record shows, and the trial court found, that it *"accounted for less of the coal produced . . . in 1967 than it did in 1959."* (App. 60a, emphasis in original; see also App. 10a.) Significantly, the trial record also showed that the *deconcentration* trend in the midwest would accelerate as Humble Oil brought its three million-ton mine on stream (App. 41a), as Peabody divested itself of a six million ton per year operation (DX 84), and as additional United Electric mines closed as their reserves played out. (App. 7a.)

[12] *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 336 (1962).

[13] For a detailed discussion of the crucial role which reserves play in a coal producer's competitive efforts, see the trial court's opinion at App. 16a-24a.

Company. This combination would have been structurally indistinguishable from United Electric-Freeman, with the resulting combination in either situation constituting the second largest coal producer in Illinois and the midwest. The government's willingness to approve a Zeigler-Midland merger "without reservation" casts doubt on both the seriousness and the substance of its contention that anti-competitive effects will follow from a continuation of the United Electric-Freeman affiliation and would seem dispositive of the issue.[14] Significantly, when he was asked to make a competitive assessment of Zeigler-Midland following a simplistic statistical approach, the government's economist at trial balked, stating, "I would still want more information. I would still want to look further." (Folsom Tr. 2591).

That the District Court's focus on the "crucial question" of the combination's likely competitive effects was sound both in fact and in law is, defendants submit, beyond question. Whether it is technically correct to designate the relevant product market energy or coal, there can be no escaping the hard facts of record with respect to the "crucially relevant" pressures on coal producers such as United Electric-Freeman arising from the vigorous interfuel competition existing in the market place. The same is true of the relevant

---

[14]The government's inconsistent and irreconcilable actions also raise basic questions of fundamental fairness in the enforcement of the antitrust laws. We have here not a case where the government has merely taken no action on the one hand, while bringing suit on the other. Rather, it is a unique situation where the Antitrust Division has taken *affirmative* and contradictory action with respect to structurally identical mergers, approving one "without reservation" while simultaneously seeking to dissolve the other. Recognizing the questionable nature of such action, the Chief of the Antitrust Division's Chicago office has stated on the record that he has "some sympathy with the defendants [United Electric-Freeman] in the Zeigler matter." (Transcript of Pre-trial Conference of October 3, 1969, p. 10.) The Zeigler-Midland affair is discussed in detail in Defendant's Proposed Findings 449-456.

geographic markets: whether United Electric and Freeman are said to serve different areas within a market or different markets, "viewed in the context of all the evidence in this case . . . an independent United Electric would not and could not compete with Freeman to any substantial degree." (App. 61a.)

In light of such economic and commercial realities found to exist by the trial court on the basis of substantial evidence, it is clear that subsidiary technicalities of market definition were not determinative of the decision below. A remand of this case with directions to the court to adopt the market definitions urged by the government would thus occasion no change in the outcome of this litigation.[15]

B. The Market Definitions Adopted Do Not Require Review By This Court.

The Product Market

There was nothing either factually or legally novel in the District Court's examination of the likely competitive effects of the United Electric-Freeman merger within the framework of an energy market. Indeed, the Federal Trade Commission recently sent to Congress a report by its Bureau of Economics on interfuel substitutability (focusing largely on utility consumers) which finds that the results of its study support the conclusion that "an energy market exists." FEDERAL TRADE COMMISSION STAFF REPORT, INTERFUEL SUBSTITUTABILITY IN THE ELECTRIC UTILITY SECTOR OF THE U.S. ECONOMY 115 (1972). The purpose of the report was to analyze the extent of interfuel

[15] In *Brown Shoe*, this Court declined to consider whether the district court had been correct in rejecting certain proposed market definitions where such markets, even if proper, would not "aid us in analyzing the effects of this merger" and where the appellant could "point to no advantage it would enjoy" even if the markets in question were used in lieu of those employed by the district court. 370 U.S. at 327.

substitution "in order to establish the product boundaries between the various energy sources." *Id.* at 2. In doing so, it confirmed that coal, gas and nuclear energy trade in a "single market," and that "the primary fuels are generally good substitutes for one another." *Id.* at 115-16.

In his dissenting opinion in the Court of Appeals stage in the *Tampa Electric* litigation, Judge Weick was similarly persuaded that

> "there exists such a degree of cross-elasticity between coal and other boiler fuels as to constitute boiler fuels the relevant line of commerce in this case. Each of the boiler fuels—coal, oil, gas and atomic energy—is utilized in the same manner to produce the same result. As each is consumed power is produced to drive the generators which in turn produce electric energy."[16]

Numerous other cases have recognized the existence of interfuel competition as well. *See, e.g., Federal Power Commission* v. *Hope Natural Gas Co.*, 320 U.S. 591, 609 (1944); *Fuels Research Council, Inc.* v. *Federal Power Commission*, 374 F.2d 842, 845, 850, 852-54 (7th Cir. 1967); *National Coal Association* v. *Federal Power Commission*, 247 F.2d 86 (D.C. Cir. 1957); *Mississippi River Transmission Corp. and United Gas Pipe Line Co.*, 41 FPC 555 (1969); *Natural Gas Pipeline Co. of America* v. *New York Central RR. Co.*, 323 ICC 75 (1964); and *Natural Gas Pipeline Co. of America*, 28 FPC 731 (1962).

In its papers to this Court, the government all but concedes that the District Court was correct in finding energy to be *an* appropriate line of commerce within which to ex-

[16] *Tampa Electric Co.* v. *Nashville Coal Co.*, 276 F.2d 766, 780 (6th Cir. 1960), *rev'd*, 365 U.S. 320 (1961). In its reversal of the majority opinion, this Court found it unnecessary to decide whether boiler fuels, rather than coal alone, was the appropriate line of commerce. 365 U.S. at 328-30.

amine the competitive effects of the challenged combination. (J.S. 12.) It would fault the District Court, however, for its supposed "failure to recognize" that coal is an *additional* line of commerce for testing the combination's competitive effects. (J.S. 14.) But as we have noted, the District Court did not choose energy as the framework for its analysis in order to ignore the merger's competitive implications within the coal industry. Rather, such choice was made because it assisted in explaining "what has happened in the *coal* industry and to *its* markets." (App. 52a-53a.)

The claim that the District Court overlooked this Court's teachings in *Brown Shoe* is without substance. *Brown Shoe* teaches that submarkets *may* exist not that they *must* exist. Indeed, this Court rejected several of the submarkets urged in *Brown Shoe* itself, stressing that "the boundaries of the relevant market must be drawn with sufficient breadth . . . to recognize competition where, in fact, competition exists." 370 U.S. at 326.[17]

In this case, what the government really despairs of is nothing more than the District Court's refusal to make its

---

[17] As to the government's claim (J.S. 13) that coal meets "all" of practical indicia of a submarket set forth in *Brown Shoe*, the record is simply to the contrary. The evidence shows, and the court found, that coal has the same "uses" as the alternative fuels with which it competes (App. 27a), that it has the same "customers" (App. 29a-40a), that coal prices have a high degree of "sensitivity to price changes" of other fuels (App. 13a, 28a-29a, 36a-39a, 43a-44a, 51a-52a) and that the "industry and public"—and, indeed, the government itself—view coal as an integral part of the energy market and not as a "separate economic entity." (App. 13a-14a, 29a, 31a-32a.) The situation in the present case thus contrasts sharply with that in *Reynolds Metals* (referred to at page 15, note 9 of the government's Jurisdictional Statement) where the court of appeals held that "florist foil may rationally be defined . . . as comprising the relevant line of commerce in terms of (1) public and industrial recognition of it as a separate economic entity, (2) its distinct customers and (3) its distinct prices." *Reynolds Metals Co.* v. *Federal Trade Commission*, 309 F.2d 223, 227 (D.C. Cir. 1962).

assessment under Section 7 *solely* on the basis of coal production statistics. As was found, however, these fail to reflect the "very real competition" coal faces from alternative fuels, they obscure actual coal marketing patterns, and they ignore reserves, "the key factor in a coal producer's market strength." (App. 65a.) This was the "coal submarket" approach urged by the government below and found by the District Court "in the context of the entire record" to be "untenable." (App. 53a.)

The government is clearly wrong in its belief that the Court's product market choice is a substantial question which this Court should consider through a review of the entire trial record. As has already been discussed, the District Court specifically stated that its use of energy as the appropriate product market was not crucial to its decision. (App. 66a.) Moreover, it took care to make it clear that its decision to use an energy market was made on the particular factual record before it and with respect to the particular merger before it. The rejection of coal as a submarket was only made "in the context of the entire record before this court." (App. 53a.)[18]

Finally, reversal of the decision below is not required to establish that coal may be used as a product market when the facts warrant. In an opinion issued subsequent to the

---

[18] Federal antitrust enforcement authorities are already on record as recognizing this. In discussing the decision below in its brief to the 10th Circuit in the *Kennecott* case, *supra*, note 10, the Federal Trade Commission made the following observation: "While the record in that case is not before the Court, the District Court apparently concluded on the basis of the record in that case that the various fuels used by electric utilities constitute a single product market. Here . . . the Commission concluded, on the basis of trade realities reflected in the record of *this* case (I, 327-31), that coal, '[w]hether a market or a submarket,' is a relevant product market for the purposes of *this* case." (Brief For Federal Trade Commission, pp. 33-34, n. 40; emphasis in original.)

filing of the Jurisdictional Statement by the government in the present action, the 10th Circuit held, on the basis of a *different factual record* and in a *different geographic context*, that coal was the relevant product market for assessing the likely competitive effects of the merger there under consideration. *Kennecott Copper Corp.* v. *Federal Trade Commission*, 5 Trade Reg. Rep. (1972 Trade Cas.) ¶ 74,157 at 92,834 (10th Cir.)[19]

The Geographic Markets

Defendants submit that the District Court was correct in rejecting the government's approach to coal markets in this action. The government proposed two "markets" at trial, the midwest[20] and Illinois, and introduced statistics showing that a significant percentage of the coal consumed in these geographical areas was produced within them.

But the fact that 82 percent of the coal consumed in Illinois is produced in Illinois, no more demonstrates it to be a market than the fact that 100 percent of the coal sold in the western hemisphere is produced there indicates that there is a western hemisphere coal market. While such data may indicate that the market is *no larger than* the area in question, it plainly provides no insight as to whether the area is itself a market.

Coal is, of course, a transportation intensive commodity. This Court has long been aware that "[a]difference of a few

---

[19] As has already been noted (*supra*, p. 11, n. 11), despite the difference in technical product market definitions, there was no real difference in the approach to interfuel competition taken by the 10th Circuit in *Kennecott* and by the District Court below in the present action.

[20] The government restyled the midwest as the "Eastern Interior Coal Province Sales Area." Not a single witness supported the existence of such a market, and the government's own economist admitted three times during his testimony that he had "problems" with its use. (Folsom Tr. 2469-70, 2536, 2608-09; and see DPF 368-73).

cents per ton in the transportation charge is normally sufficient to divert a coal contract from one mine to another." *Ayrshire Collieries Corp.* v. *United States*, 335 U.S. 573, 586 (1949). It is not surprising, then, that the District Court found that the "evidence clearly indicates that transportation costs largely determine those facilities for whose business coal mines are able to compete and those mines to which coal consumers can practicably turn for supplies." (App. 57a; see also App. 19a-20a.)

As the court observed, "[r]esponses to the subpoena questionnaire [which the District Court had ordered] sent to midwest coal consumers demonstrated that each Freight Rate District serves a distinct and definable area, as did the testimony of producers and consumers." (App. 57a.) Indeed, even the Bureau of Mines economist who prepared the statistics used by the government recognized that the market areas in which coal can be sold are determined by Freight Rate Districts and not by state boundaries. He testified that his statistics did not deal with specific markets and conceded that "anyone with even a minimum amount of knowledge of the coal industry" knows that consumers in the Fulton-Peoria area, for example, cannot be sold coal from Southern Illinois on a competitive basis. (Gallagher Dep. 3, 100, 103-04; see also DPF 344, 371.)[21]

The shortcoming of the government's market delineation procedure in drafting its complaint, then, was simply that it was incomplete. Had the government carried its own

[21] In rejecting the "markets" proferred by the government, the District Court was also no doubt influenced by the testimony of the government's economist that "you have to have the testimony from the people about the fact that they buy coal from all over this area, et cetera, to justify saying this is a market." (Folsom Tr. 2608.) As the court's opinion noted, "[t]here is no evidence in this record that any customer of either United Electric or Freeman purchased, or that any producer sold, coal throughout either of the Government's proposed markets." (App. 56a.)

technique one step further, it would have found, as did the trial court, that the ICC-designated Freight Rate Districts in which the mines of United Electric and Freeman were located[22] serve the "separate and distinct" sales areas of each Freight Rate District, the facilities of Commonwealth Edison and facilities located in the metropolitan Chicago area. (App. 57a-59a, 62a.) In keeping with this Court's teaching in *Brown Shoe* that the geographic framework within which the effects of a merger are examined must " 'correspond to the commercial realties' of the industry" (370 U.S. at 336), the District Court designated these markets as the relevant geographic markets in this proceeding.[23]

The government's claim (J.S. 16) that the markets adopted below "exclude all sales to Chicago [and] all sales to Commonwealth Edison" is wrong. Far from being excluded, sales to Chicago and Edison were specifically identified and carefully considered by the trial court. (App. 57a-59a, 62a.) That the government knows full well that the geographic markets adopted by District Court are not based on "enormous exclusions" is confirmed by its own admission in advance of trial that "[i]n 1967, approximately 97 percent of the production in the Fulton-Peoria Freight Rate District, 100 percent of the production in the Springfield Freight Rate District, 98 per-

---

[22] United Electric's mines were shown to be in the Fulton-Peoria and Belleville Freight Rate Districts, while Freeman's mines were shown to be in the Springfield and Southern Illinois Freight Rate Districts. (App. 4a, 6a, 9a-10a; Weir Dept. Ex. 1; Nugent Dep. Ex. 38.)

[23] It should be noted in this regard that the distribution patterns which formed the basis for the markets adopted by the trial court were not "alleged"—as the government now styles them (J.S. 15)—but rather *stipulated* in advance of trial. (See DPF 316-20, 323-27, 330-34, 337-42.)

cent of the production in the Belleville Freight Rate District and 85 percent of the production in the Southern Illinois Freight Rate District, was shipped to one or more of [these] market areas. . . ." (DPF 342.) Where two or more separate markets have been identified, the statement that sales to one market "exclude" sales made to another market is a tautology and meaningless.[24]

There is nothing novel in the District Court's factual approach to analyzing coal marketing patterns. To the contrary, both its choice of markets and rejection of the alternatives proposed by the government involve merely a recognition of the economic realties underlying an appreciation that even the most unsophisticated laymen have had for some 400 years: you don't "carry coals to Newcastle." JAMES MELLVILLE, AUTOBIOGRAPHY 163 (1583).

In any event, the District Court's finding that the markets served by the Freight Rate Districts in which the mines of United Electric and Freeman are located provide the appropriate geographic framework for assessing the likely effects of the challenged combination is confined to the record facts of this case. It no more conflicts with *Pabst*[25] or precludes the use of a state or regional geographic framework in future proceedings than does the holding in *Kennecott* (stipulated to by the government) that a *na-*

---

[24] That omitting dust is proper in analyzing coal distribution patterns is established by substantial evidence. The records shows that dust is a by-product of metallurgical coal and, like metallurgical coal, is a non-competing product with a market of its own. (See DPF 351-54 and record references cited therein.) As for the charts introduced by the government at trial purporting to show common customer shipments, these were thoroughly discredited at trial. (See generally App. 62a-63a; DPF 347-356; Defendant's Post-Trial Brief, pp. 72-80.)

[25] *United States* v. *Pabst Brewing Co.*, 384 U.S. 546 (1966).

tional geographic framework provided the proper framework for assessing the competitive implications of the merger there under consideration. *Kennecott Copper Corp.* v. *Federal Trade Commission, supra,* ¶ 74,157 at 92,834.

• • •

A plenary review of the trial record in this direct-appeal case would place a "great burden" on this Court, now faced with substantial and increasing demands on its time to consider a broad spectrum of legal issues.[26] Under these circumstances, and because the "entirely subsidiary" market definition questions of which review is sought are unsubstantial and not determinative, the decision below should be summarily affirmed.[27]

---

[26] *United States* v. *Singer Manufacturing Co.*, 374 U. S. 174, 175, n. 1 (1963). See also *Brown Shoe Co.* v. *United States*, 370 U. S. 294, 355 (1962) (Clark, J. concurring opinion); *United States* v. *Borden Co.*, 370 U.S. 460, 477, n. (1962) (Harlan, J. dissenting opinion).

[27] The government's slur on the independence and integrity of the opinion below is wholly unwarranted and should be repudiated. The assertion (J.S.11, n.8) that two parts of the district court's six-part opinion were taken *verbatim* from Defendants' Proposed Findings of Fact is spurious. Of the 145 proposed findings referred to by the government, no less than 112 were omitted, revised or supplemented. Further, of the 33 proposed findings that *were* adopted *verbatim*, 22 were admitted in whole or in part by the government. There can be no doubt then that the trial court's opinion is truly its own. Chief Judge Robson, who heard all of the evidence and spent nearly two years fashioning his decision, was the coordinating judge in the civil electrical antitrust cases, an original member and the first chairman of the Judicial Coordinating Committee for Multiple Litigation and one of the principal architects of the Manual for Complex and Multidistrict Litigation.

III.

THE COURT'S CONCLUSIONS WITH RESPECT TO UNITED ELECTRIC'S LACK OF COMPETITIVE POTENTIAL WERE CORRECT AND SUPPORTED BY SUBSTANTIAL EVIDENCE

Industry Field and Round Prairie

The government's lay speculation (J.S. 22-24) that United Electric could survive as an independent coal producer on the basis of its Industry Field strip reserves and its Round Prairie deep reserves was rejected by the trial court on the basis of abundant record evidence. These fact questions were among the principle issues below and were decided on the basis of reports and expert testimony from geologists, mining engineers, industry witnesses and defendants. The District Court agreed these reserves were not mineable and could not be developed by United Electric (App. 9a-10a, 63a). Surely, resolution of these types of questions, on the basis of all the evidence, is peculiarly within the province of the trier of fact.

The government's claim that Industry and Round Prairie hold the key to a successful future for United Electric has the same hollow ring it had below following government counsel's confession that "as of today they are not commercially valuable." (Transcript of Pre-trial Conference of October 3, 1969, p. 23.)

Apart from the obvious fact that the twelve and a half million tons of coal at Industry would hardly be sufficient for the opening of a modern coal mine (see App. 16a-18a, 21a-22a), the evidence was that the field has no mining potential. The coal seam is thin, the overburden ratio high,[28] unfavorable mining conditions are present and the

[28] Overburden ratio expresses the amount of overburden (cubic yards) which must be removed to uncover a ton of coal. (App. 16a, n. 17.)

field is distant from transportation arteries. Moreover, the high sulphur content of the coal bars it from any market where air pollution controls are keyed to that factor.[29]

An evaluation of the Industry Field by the firm of Paul Weir Company—consultants for the Federal Government, coal producers, railroads, electric utilities and financial institutions, and acknowledged by one of the government's own witnesses to be one of the most widely known and highly regarded mining engineering companies in the world (Hopper Tr. 1894; see DPF 38)—confirmed the reserves had no promise. (DX 87.) During his deposition by the government, Mr. Weir testified that "I don't think these reserves will ever be mined, in any circumstances." (Weir Dep. 60.) The government's attempt to present trial testimony to the contrary failed completely. (See Hopper Tr. 1876-78, 1895-1901.)[30]

The government's Industry Field contention is further betrayed by the inference that United Electric has still *other* uncommitted but mineable strip reserves. (J.S. 23; see also J.S. 2 and 12.) These "other reserves" consist of a patch of less than 350,000 tons separated from United

[29] See DPF 391-396 and record references therein cited. Hereafter, references to defendants' proposed findings below are meant to include the record references set forth in those findings.

[30] The government completely misquotes the testimony of the former UEC president. (J.S. 23-24.) Mr. Nugent said Industry would *not* be mined, under any circumstances, until "all of the commercially mineable coal in Fulton County is exhausted" and placed that finality twenty years in the future, not ten to twelve. (Nugent Dep. 343, 346.) Not only did his deposition testimony in its entirety (*id.* at 338-47) make clear the field had no promise ("this was a most uneconomical proposition and a most unwise investment," *id.* at 342), but Mr. Nugent's trial testimony on the subject two years later was similarly pointed: "With the further development of nuclear energy, my present thinking is that the Industry Field will probably never be mined and that the company had better take its licking now and dispose of the land, at farm prices if need be." (Nugent Tr. 1946; see also Tr. 1983-85.)

Electric's Buckheart mine and unreachable, and a similarly isolated tract of 1,700,000 tons some distance from the company's Fidelity mine. In its post-trial papers, the government was candid enough to admit that "these reserves, by themselves, could not support a new mine operation." (Gov't. Resp. to DPF 397, p. 204.)

The government takes no issue with the court's finding that United Electric does not have the possibility of acquiring additional economically mineable strip reserves. (App. 65a.) It could not credibly do so, in view of the substantial evidence presented at trial "by experts, by state officials, by industry witnesses and by the Government itself indicating that economically mineable strip reserves that would permit United Electric to continue operations beyond the life of its present mines are not available." (App. 63a; see also DPF 398-411.)

Equally dispositive was the evidence with respect to the deep coal reserves at Round Prairie and United Electric's inability to mine them.

As the Court found, again in one of the major factual disputes below, "United Electric is a strip mining company with no experience in deep mining nor likelihood of acquiring it." (App. 61a.) The government admitted that until 1959, in communications with stockholders, landowners and others in the industry, United Electric held itself out as strictly a strip mining organization. (Gov't. Resp. to DPF 101, p. 18.) In its 1956 Annual Report, the company stated "[f]or thirty-eight years your Company has been engaged in a single business—mining bituminous coal by the strip or open pit method." (GX Kolbe Dep. Ex.2 p. 7.) The government's Statement of Facts misleads the Court when it says United Electric "has not operated an underground *mine* since 1954." (J.S. 8.) As the government admitted, this was

a "short lived and unsuccessful drift *operation*"[31] at one of United Electric's strip mines between 1952 and 1954. (Gov't. Resp. to DPF 103, p. 19.) There was no underground *mine* at all.

While the government would like to make something of the fact that United Electric began acquiring its Round Prairie deep reserves in 1958, "the year before Material Service assumed control of UEC" (J.S. 22), it overlooks the fact that it admitted to the District Court that the United Electric-Freeman affiliation was initiated in 1954 and that "[s]ince *at least 1958*, UEC has made it a practice to confer with Freeman regarding any deep mining possibility." (Gov't Resp. to DPF 113, 124, pp. 22-23.) The evidence demonstrated that United Electric never gave real consideration to deep coal reserves until it and Freeman's management had become closely associated. (See DPF 114.)

The government purports to rely on the testimony of Nicholas Camicia, president of *both* Freeman and United Electric in the late 1960's, in contending that all one needs is money to undertake successfully deep coal mining. (J.S. 23.) What the government omits to state is that Mr. Camicia—by the time of trial, president of the Pittston Company, one of the country's largest deep coal producers—testified that based on his professional knowledge and expertise as a deep mining engineer and executive, he did not see how United Electric could possibly make a successful grass roots entry into the deep mining of coal and "[t]hey would have made a mistake if they had tried." (Camicia Tr. 1393, 1422.)

The expert opinion in the record was that United Electric's experience as a strip miner would be of no assistance

[31] Drift mining involves merely punching into an already exposed seam of coal, usually from the pit floor. (See Camicia Tr. 1388-91.)

to it in attempting to undertake deep mining operations. (DX 87, pp. 28-30; Camicia Tr. 1392-93.) The government admitted that the extraction processes and technology are different for strip and deep coal mining, (Gov't. Resp. to DPF 415, p. 214) and that deep mining poses different engineering problems and working conditions from strip mining. (*Id.*, DPF 417, p. 215.) Further, the testimony of a number of utility consumers confirmed that because of the complexities, difficulties and risks which deep mining involves, a large buyer of coal would be reluctant to enter into a contract for deep coal with a company with no proven experience. (See DPF 419-20.) As observed by the 10th Circuit in the *Kennecott* case, the "essentials" for new entry into the coal business are "extensive reserves and ready ability to deliver," "experience, know-how and equipment." *Kennecott Copper Corp.* v. *Federal Trade Commission*, *supra*, ¶ 74,157 at p. 92,836 (10th Cir.). As for deep mining, United Electric has none of these.

Given the fact that, as the record supports, there is no reasonable probability that United Electric could successfully undertake deep mining, there is therefore no reasonable probability that it would try. Both common sense and the government's own prior observations belie the validity of any parallel (J.S. 22-23) between what Humble Oil, subsidiary of the world's largest industrial corporation, would do and could do, and what an independent United Electric might successfully undertake. The government pointed out (DX 81-83) in *United States* v. *Standard Oil Co. (New Jersey)*, 253 F.Supp. 196 (D.N.J. 1966), that there is no correlation between Standard Oil's ability to make a grass roots entry into deep mining and that of a smaller company attempting a similar venture. (*Id.* at 200, 208, 223, 227.) In any event, Humble's mine had not opened at the time of trial and as one witness put it, "the jury is still out" as to whether it will be successful. (Camicia Tr. 1424.)

The government's reference to Ayrshire Collieries (J.S. 23) is less than candid. While it is true that Ayrshire did develop a deep mine after many years of operating as a strip miner, it did not do so *until after acquiring two deep mine companies*. Even so, the mine has been a failure and Ayshire has written off five million dollars of its investment and would "absolutely not" have undertaken the venture had it known what was in store. (Hopper Tr. 1878-81).

Finally, the evidence was that United Electric's only deep coal reserve field, Round Prairie, was not mineable by *anyone* in the near future. (See DPF 428-29.) The government admitted "they may not be commercially mineable at the present time." (Gov't. Resp. to DPF 429, p. 220.)

As with all the other central questions of fact in this case, the District Court's findings with respect to United Electric's competitive potential were based on the evidence in the record. We submit that if that record is reviewed, it cannot be reasonably maintained that there is not substantial evidence to support the trial court's conclusion that "virtually all of the economically mineable strip reserves of United Electric have been sold under long-terms contracts, and United Electric has neither the possibility of acquiring more nor the ability to develop deep coal reserves." (App. 65a.)

The Argument that United Electric's Competitive Potential was "Cut Off" has no Merit

The government concedes that the District Court was correct in assessing whether the challenged acquisition may substantially lessen competition "from the vantage point of the time of suit." (J.S. 21). Neither does the government quarrel with the logic of the conclusion that if United Electric has no competitive potential, continuation of its affiliation with Freeman poses no anticompetitive threat. Even the

government's trial economist repeatedly agreed. (Folsom Tr. 2584, 2599, 2621.) The government counters, however, that the court below erred in failing to determine the "competitive potential cut off by the acquisition" in 1959. (J.S. 2, 22.) This contention is contrived and has no merit.

The government grasps for straws in citing two sentences (J.S. 21) out of the court's 73 page opinion which it contends demonstrate that the court measured United Electric's competitive potential at the wrong time. As the government knows full well, the court's observation that there was no evidence that "reserves are *presently* available," and that "United Electric *has* [not] the ability to acquire more," (App. 63a; emphasis is original) were not intended to contrast United Electric's condition and prospects at trial with those obtaining in 1959. Rather, they were responsive to the government's speculations at trial—repeated here (J.S. 23-24)—that mining conditions have changed in the past, that they may continue to change, and that "properties which UEC has investigated in the past . . . may become economically strippable in the future." (Govt. Post-Trial Brief, p. 141; see also Def. Post-Trial Brief, pp. 88-89.)

Although the government, until the filing of its Jurisdictional Statement, had never suggested—much less urged—that the court measure United Electric's competitive potential in *1959*, the trial court time-and-again specifically addressed itself to the 1959 evidence. For example, "[t]he challenged combination has been in effect *since 1959*, and yet no adverse consequences with respect to competition were shown either *to have occurred* or likely to occur," (App. 64a); "[t]he combination is *in its second decade without demonstrating* any of the indicia of concentration" (App. 60a); "[t]he mines and coal reserves of United Electric are, *and have been since prior to 1959*, lo-

cated in different Freight Rate Districts than the mines and coal reserves of Freeman" (App. 62a); and "[t]hese companies *have been* and are now predominantly complementary in nature" (App. 61a).[32]

The government's criticism (J.S. 20-21) of the court's concern with events in the period immediately preceding and surrounding the trial comes with ill grace. As the decision of the trial court points out, these were "the years chosen by the Government for analysis." (App. 62a.) Thus, the principal focus of the complaint is on 1965 to 1967 (Complaint ¶ 11-20); the government's alleged common customer charts were confined to the 1965-67 (GX 85-91); all of the government's concentration and market share charts combined United Electric and Freeman data only in 1967 and subsequent years (GX 73, 86; compare GX 71 with GX 72, and GX 84 with GX 85); and the government advised the trial court that its coal industry rebuttal witnesses would be called to testify "as to the *availability* of strip and underground coal reserves" and "future strip mining possibilities." (Government Counsel, Tr. 1377).

The government's argument (J.S. 24) that "if UEC does not now have adequate reserves, or the prospects of acquiring more, it is because of management policies imposed on it *after* the acquisition," is totally at odds with the record evidence.

---

[32] It is not surprising that the District Court found nothing in the 1959 evidence indicating a Section 7 violation. The Antitrust Division in its investigation at that time did not even view the situation as warranting the issuance of a complaint. As the District Court's opinion notes, shortly after Material Service achieved common control of UEC and Freeman, Material Service was itself acquired by General Dynamics. "An investigation by Antitrust Division of the Department of Justice ensued, during which the Government was furnished information with respect to the stock ownership of Freeman and United Electric. No further action was taken by the Government." (App. 8a)

The events which decreed that United Electric would reach the end of its competitive significance in the 1960's did not take place *after* 1959, as the government would like to have it, but in the years long prior to that date.

As has been discussed at pages 26-27 above, United Electric's failure to acquire experience in deep coal mining had been the conscious choice of United Electric management since the 1920's. That this destined United Electric to a future of exclusively strip mine operations (absent merger with a significant deep coal producer), is confirmed by the fact that, except for Humble Oil,[33] no company has even attempted to open a large-scale deep mining coal operation on a grass roots basis in recent history in the midwest. (See DPF 24.)

With respect to strip coal reserves, again it was the conscious choice of United Electric management prior to 1959 not to be aggressive in its acquisition of additional coal reserves.[34] (Kolbe Dep. 189, 300-02.) The government admitted that prior to 1955 United Electric acquired *only seven* of the more than 200 fields of coal reserves it had examined. (Gov't Resp. to DPF 84, p. 9.) As a result, and as the government also admitted, by 1960, Peabody Coal Company, Truax-Traer, Ayrshire Collieries, Southwestern and Midland Electric Coal Companies (all predominant or exclusively strip mine companies) had reserves substantially greater than United Electric. (Gov't Resp. to DPF 86-87,

[33] But see page 28, *supra*.

[34] The facts with respect to United Electric's poor pre-merger reserve acquisition policies and capabilities and the post-merger steps to improve the situation were detailed in Defendant's Proposed Findings 84-123. It was because of its debilitated condition prior to the challenged merger that United Electric, as the District Court's opinion noted, had made a number of "unsuccessful attempts to merge with, or to acquire, other Illinois coal producers." (App. 8a, n. 7.)

p. 11.) It was in the 1950's and before that the scramble for strippable coal reserves took place. United Electric, under its pre-merger management, chose not to participate in that contest. (See DPF 84-89, 91.)

So intense was this competition for reserves that, according to the opinion of one expert geologist (whose principal occupation since 1932 had been the acquisition of coal rights for sale to producers) "by 1960, there was no longer any possibility of acquiring or establishing, for transfer to coal producers, any new economically mineable strip coal acreage in the Illinois basin [Illinois, Indiana and West Kentucky] of sufficient size to justify the opening of new mines." (DX 88: Organ Dep. *passim*.) This was confirmed by the testimony from other companies that had been unsuccessful in searching for midwestern strip coal reserves at the end of the 1950's and after. (Dorrance Dep. 11; stipulated testimony of George Shipley (Humble).)

The evidence showed that once control of United Electric was gained in 1959 by Material Service-Freeman, vigorous efforts were commenced to acquire additional reserves. (See DPF 92-97.) United Electric was even then having trouble with its utility customers because of its reserve position. (See DPF 89.) Accordingly, and as the government admitted, United Electric investigated many potential strip coal areas throughout Illinois, Indiana and Kentucky, but these efforts were unsuccessful. None of the fields examined were found to contain economically mineable coal. (Gov't. Resp. to DPF 95-96, p. 16.)

In the face of the concession in its Response to Defendants' Proposed Findings that, "the Government admits that after 1959, UEC's management sought to acquire economically recoverable reserves, i.e., reserves which were merchantable and capable of making a profit," (*id.* at p. 15) it ill becomes the government now to contend that United

Electric's management policies after 1959 are to blame for the company's lack of adequate reserves.

The government's "1959" argument is a contrived afterthought. In any event, the court's analysis covered the full history of the combination from prior to 1959 to date, and its effect on competition throughout that period. There was no obscuring of "the real competitive potentialities cut off by the acquisition," for the record demonstrated the contrary. Not only did the affiliation with Freeman launch United Electric on a vigorous (though admittedly unsuccessful) coal reserve exploration program, provide it with access to deep mining experience and know how, but United Electric's competitive potential was actually prolonged beyond what it would otherwise have been. As the District Court found, *"United Electric's existing contracts with Central Illinois Light Company, Northern States Power, and Union Electric are backed up by the reserves of Freeman and could not have been obtained without that guarantee"* (App. 63a, emphasis in original; see also DPF 443-445).[35]

In sum, if there were any competitive potentialities of United Electric that were "cut off," it was *prior to* 1959 and at the hands of its prior management.

[35] As was candidly stated by the government in its Response to Defendant's Proposed Findings (p. 24): "The Government admits the record shows that possibly in three instances, UEC would not have been awarded a particular coal contract without committing some Freeman reserves to the contract. . . ."

CONCLUSION

The motion to affirm should be granted.

Respectfully submitted,

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
2900 Prudential Plaza
Chicago, Illinois 60601

KIRKLAND & ELLIS
Chicago, Illinois

ALBERT E. JENNER, JR.
Room 3300
135 So. La Salle St.
Chicago, Illinois 60603

JENNER & BLOCK
Chicago, Illinois

Of Counsel

Attorneys for Defendants

October 10, 1972

Supreme Court, U. S.
FILED
NOV 3 1972
MICHAEL RODAK, JR., CLERK

No. 72-402

In the Supreme Court of the United States

OCTOBER TERM, 1972

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

BRIEF FOR THE UNITED STATES IN OPPOSITION TO MOTION TO AFFIRM

ERWIN N. GRISWOLD,
Solicitor General,
THOMAS E. KAUPER,
Assistant Attorney General,
ALLAN A. TUTTLE,
Assistant to the Solicitor General,
CARL D. LAWSON,
HUGO S. SIMS, III,
Attorneys,
Department of Justice,
Washington, D.C. 20530.

In the Supreme Court of the United States

OCTOBER TERM, 1972

No. 72-402

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

BRIEF FOR THE UNITED STATES IN OPPOSITION TO MOTION TO AFFIRM

F.2d 11/2/72

Appellees suggest that there are no substantial questions for this Court because (1) the lower court's market definitions, even if erroneous, were immaterial to its conclusion that the Freeman-UEC combination had no anticompetitive effect and (2) UEC's "terminal condition" precludes the possibility of any such effect. However, the court's finding of a lack of anticompetitive effect was based squarely on its acceptance of the appellees' proposed geographic markets, and the

487-566—72

record shows that UEC was far from moribund at the time of its acquisition.

1. Although the district court did say it would have found that no substantial lessening of competition resulted from the Freeman-UEC combination even if it had accepted the government's geographic markets (J.S. App. 59a–60a), the court's subsequent discussion of competitive effects (J.S. App. 60a–64a) was based upon its acceptance of "[t]he Freight Rate Districts in which the mines and reserves of United Electric [as] * * * separate and distinct [geographic] markets from those in which the mines of Freeman are located" (*id.* at 62a).

Appellees quote the lower court's alleged holding that there would be no Section 7 violation "even were this court to accept the Government's unrealistic product and geographic market definitions" (Motion to Affirm, p. 2; J.S. App. 66a). The court's full statement, however, was: "nor would divestiture benefit competition even if this court were to accept the Government's unrealistic product and geographic market definitions" (J.S. App. 66a). The ruling, therefore, was not with respect to the Section 7 violation, but with respect to whether the normal relief for such violation would here "benefit competition." As we have argued, one of the lower court's errors was its attempt to assess Section 7 violations by evaluating the "benefit[s]" of "divestiture" (J.S. 20–22).

The suggestion that the decision below accords with *Kennecott Copper Corp.* v. *Federal Trade Commission*, 5 Trade Reg. Rep. (1972 Trade Cas.) ¶74,157 (C.A. 10), petition for certiorari pending, No. 72–637

demand increases and more easily extractable coal

(Motion to Affirm, p. 11), is unfounded. The court of appeals not only rejected Kennecott's contention that the energy market rather than the coal market should have been adopted to assess the effect of the merger of a coal company and a potential entrant into the coal industry, but also concluded that interfuel competition has no significant effect upon coal prices in the national market. *Id.* at p. 92,840. Interfuel competition has even less impact in coal producing regions than in the nationwide market adopted in *Kennecott*.

2(a). In their attempt to portray UEC as a dying company, appellees dismiss UEC's reserve holdings and other uncommitted coal deposits in the Eastern Interior Coal Province as not "economically mineable" (Motion to Affirm, pp. 26, 33). But what is not economically mineable today may become so tomorrow. Reserves which cannot profitably be mined at one time may become economically mineable at a later time as it becomes exhausted. Thus when Mr. Organ testified that by 1960 there was no available economically mineable strip coal left in the area (Motion to Affirm, p. 33), he had in mind a maximum overburden ratio of 20 to 1[1] (Organ Dep. 111–112). At the time of trial, however, there were four strip mines in the Eastern Interior Coal Province operating at a greater average overburden ratio (DX 49) and another mine being developed which would have a 35 to 1 overburden ratio (Tr. 1980–1982).

[1] The overburden ratio expresses the number of cubic yards of overburden which must be removed to uncover a ton of coal (J.S. App. 16a, n. 17).

This limited view of what constitutes economically mineable reserves underlies appellees' claim that "vigorous efforts were commenced to acquire additional reserves" under their management (Motion to Affirm, p. 33). The testimony of UEC officers that the post-1959 management attempted to acquire "satisfactory reserves, mineable and merchantable, and capable of making a profit" (Camicia Dep. 196) does not mean that UEC attempted during the 1960's to acquire reserves for long-term development. UEC failed to acquire additional reserves after 1959 because it only attempted to acquire reserves which could be profitably developed in the near future. This is confirmed by a 1960 Board meeting at which the directors "decided not to pursue an aggressive purchasing policy" in the Industry Field area because "development of this field is probably some 10 years in the future * * *" (GX 201, p. 4023).

An Ayrshire executive testified that Ayrshire did acquire strip reserves in Illinois and Indiana after 1960 and that other coal producers had also done so (Tr. 1867–1869).[8] The Belle Rive field which UEC decided not to acquire in 1963 or 1964 (Inman Dep. 82–88) was being developed by another company at the time of trial (Tr. 1911). Commonwealth Edison was in the process of acquiring extensive central Illinois strip

[8] He also testified that his company was actively prospecting for strip reserves in Illinois, Indiana and western Kentucky (Tr. 1914). Thus the industry apparently did not share Mr. Organ's conviction (Motion to Affirm, p. 33) that, by 1960, all useable coal strip reserves in the Eastern Interior Coal Province were committed.

reserves at the time of trial which it expected to use (Tr. 1625, 1644, 1667–1668).

(b) The record does not establish that it will be impossible economically to mine any significant portion of the billions of tons of strip reserves in the Eastern Interior Coal Province which remained uncommitted at the time of trial in 1970[3] before UEC's present mines are exhausted.[4] Since appellees' claim that UEC is a self-liquidating company is essentially an affirmative defense, akin to the failing company defense, it was incumbent on them to demonstrate that these reserves will not become economically mineable.

Nor does the record establish that UEC's existing strip reserves in Industry Field cannot be profitably mined in the future. The appellees cite the testimony of Paul Weir, whose company was a litigation consultant for the appellees, that he did not think Industry Field would ever be mined (Motion to Affirm, p. 25).

---

[3] The Illinois State Geological Survey estimated that 19 billion tons of strip reserves remained in the ground in Illinois in 1968 (Simon Dep. Ex. 1, pp. 62–63). In the same year coal producers owned, leased or had optioned approximately 1.78 billion tons of strip reserves in the Eastern Interior Coal Province (DX 62). Appellees have misunderstood the Jurisdictional Statement in assuming that references to other available reserves refer to reserves now owned by UEC rather than uncommitted reserves UEC can acquire (see Motion to Affirm, p. 26).

[4] The district court did not find that such reserves will not be mineable; rather it said that some evidence had been introduced indicating that "economically mineable strip reserves that would permit United Electric to continue operations beyond the life of its present mines are not available" and the government had introduced no evidence that such reserves were "*presently* available" (J.S. App. 63a).

A 1959 asset evaluation report of the Paul Weir Company stated however: "The * * * Industry Field will have substantially higher stripping ratios. In time, competitive conditions will permit their profitable development" (GX Kolbe Dep. Exh. 59, p. 3).[5] Although Mr. Nugent, UEC's president, testified that he no longer believed the field would be mined (Tr. 1946), UEC's officers had always assumed in the past that it would be mined in the future (GX 201, p. 4023; Inman Dep. 162, Nugent Dep. 343–346)[6] and had declined to consider an offer to find another purchaser for the property (Kolbe Dep. 816).

(c) Appellees' present suggestion that UEC's existing reserves in Round Prairie are worthless (Motion to Affirm, pp. 24, 26–29) is similarly based on the assumption that, to have value, reserves must be "economically mineable" presently or in the near future. This is indicated by their reliance on the Government's statement at pretrial that "*as of today* [the reserves] are not commercially valuable" (emphasis added) (Motion to Affirm, p. 24). Appellees never

[5] Their subsequent litigation report cited by appellees as confirming that these reserves "had no promise" (Motion to Affirm, p. 25) describes the reserves as "marginal" and states that the reserves "would not be competitive in the foreseeable future * * *" (DX 37, p. 4).

[6] Appellees claim that Mr. Nugent's deposition testimony "in its entirety" demonstrates that he believed the Industry Field "had no promise" (Motion to Affirm, p. 25, n. 30). We submit, however, that the testimony as a whole indicates that he then expected that the field would be mined after the Fulton County coal is exhausted, but he believed the pre-1959 management should not have paid so much money for a field which will not be mineable until the 1980's.

suggested at trial that UEC's deep reserves in Round Prairie cannot be profitably mined in the future.

The record does not support appellees' suggestion that UEC acquired these reserves for Freeman (Motion to Affirm, p. 27). To the contrary, a UEC director denied that UEC ever planned to "turn over" this corporate opportunity to Freeman (Tr. 893–894).

Appellees apparently rely solely upon Mr. Camicia's statement that he thought it "would be a mistake" for UEC to enter deep mining as establishing that this financially strong company could not do so.[7] Since Mr. Camicia also said that he thought Ayrshire had made a mistake in entering deep mining (Tr. 1426),[8] expressed skepticism as to the wisdom of Humble's venture (Tr. 1424), and testified that he had advised Kennecott that it could only make a successful entry into deep coal mining by acquiring a coal company (Tr. 1395–1396), his testimony merely reflects his view that it would be a mistake for any company to enter deep coal mining. In *Kennecott,* the Federal Trade Commission and the court of appeals held that Kennecott Copper Corporation's acquisition of the Peabody Coal

---

[7] DX 81–83 and the opinion in *United States* v. *Standard Oil Co.* (New Jersey), 253 F.Supp. 196 (D. N.J), merely state that Standard Oil is a very large company with adequate capital to enter potash mining.

[8] Appellees' discussion of Ayrshire's entry into deep mining omits some important facts. The deep mining companies Ayrshire acquired were quite small (Tr. 1869) and Ayrshire did not decide to abandon deep mining when its first venture proved unprofitable. An Ayrshire executive testified that the company expects to mine other deep reserves which it owns (Tr. 1872).

Company, a deep and strip mining company, violated Section 7 because Kennecott was a potential entrant into the coal business by internal expansion or limited acquisition. This suggests that at least one court of appeals would disagree with Mr. Camicia's conclusions respecting the impossibility of a grass roots entry into deep coal mining.

Thus, the record does not establish that UEC was destined to disappear in 1959, or even in 1970. The case thus presents substantial questions for this Court's consideration.

Respectfully submitted.

ERWIN N. GRISWOLD,
Solicitor General.
THOMAS E. KAUPER,
Assistant Attorney General.
ALLAN A. TUTTLE,
Assistant to the Solicitor General.
CARL D. LAWSON,
HUGO S. SIMS, III,
Attorneys.

NOVEMBER 1972.

U.S. GOVERNMENT PRINTING OFFICE: 1972

Supreme Court, U. S.
FILED
NOV 10 1972

No. 72-402

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1972

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

REPLY BRIEF IN SUPPORT OF THE MOTION TO AFFIRM

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
2900 Prudential Plaza
Chicago, Illinois 60601

KIRKLAND & ELLIS
Chicago, Illinois

ALBERT E. JENNER, JR.
Room 3300
135 So. La Salle St.
Chicago, Illinois 60603

JENNER & BLOCK
Chicago, Illinois

Of Counsel

Attorneys for Defendants

November 8, 1972

La Salle Street Press—Chicago/PrinterLink

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1972

No. 72-402

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

REPLY BRIEF IN SUPPORT OF THE MOTION TO AFFIRM

Filed 11/2/72

The government's brief in opposition to the Motion to Affirm serves only to demonstrate that the decision below should be summarily affirmed. Discussing but a single case, the government devotes its brief to quarreling with the District Court over the conclusions which it reached on the basis of abundant record evidence. The 7,500 pages of testimony and 10,000 pages of exhibits which formed the substantial evidence upon which the decision below rests can-

not be swept aside, however, by a few fragments of evidence from this massive record. Such an effort to short-circuit the trial record ignores that the question on review in Section 7 cases, as in all other cases, is whether the decision of the trial court is supported by substantial evidence.

At the outset, the government seeks to avoid the District Court's unmistakable holding that the longstanding affiliation of United Electric and Freeman would not violate Section 7 even if the government's product and geographic market definitions were accepted. (App. 59a-60a, 65a-66a.) The government asserts that one of the court's findings in this regard was addressed solely to the question of relief. (Govt. Brief, p. 2.) This argument rests on the government's representation that the "full statement" of the District Court was as follows: "nor would divestiture benefit competition even if this court were to accept the Government's unrealistic product and geographic market definitions." This was hardly the District Court's *full* statement. To the contrary, the court's "full statement" was as follows: "Under these circumstances, continuation of the affiliation between United Electric and Freeman *is not adverse to competition*, nor would divestiture benefit competition even were this court to accept the Government's unrealistic product and geographic definitions." (App. 65a-66a, emphasis supplied.)

The government's attack on a second holding by the District Court that it would have found no substantial lessening of competition if it had accepted the government's geographic markets (App. 59a-60a) rests on a similarly heavy-handed editing, as well as a misreading, of the trial court opinion. The court's own discussion of the likely competitive effects of the combination (App. 60a-64a) makes clear that *none* of its findings with respect to concentration, competitive overlap, types of mining, types of coal, Commonwealth Edison, United Electric's inability to serve Chicago, United Electric's "singularly unpromising" coal reserve prospects and the like were dependent upon the

geographic markets chosen by the court or would have been different had the markets urged by the government been adopted.

Indeed, the government does not and cannot point to a single specific finding in the court's entire opinion that hinged upon resolution of this issue. As to the trial court's finding (unedited here) that "[t]he Freight Rate Districts in which the mines and reserves of United Electric are located serve separate and distinct markets from those in which the mines of Freeman are located" (App. 62a.), this was not addressed to the subsidiary *legal* question of the appropriate "section of the country" but to what the *facts* of record showed with respect to the marketing of coal. Whether it is technically correct to say that United Electric and Freeman serve separate markets within a "section of the country" or to say that they serve separate "sections of the country," there can be no escaping these hard facts showing that "an independent United Electric would not and could not compete with Freeman to any substantial degree." (App. 61a.)

Neither the government's editing nor its arguments can obscure the fact that the subsidiary questions of market definition did not control the District Court's ultimate conclusion that the challenged combination does not violate Section 7. Since these subsidiary questions were neither material to the decision below nor involved any break with precedent, they clearly raise no substantial questions requiring review by this Court.

Nor can the government, by grasping at evidentiary fragments in a record of immense proportions, escape the substantial evidentiary support for the District Court's conclusion that "virtually all of the economically mineable strip reserves of United Electric have been sold under long-term contracts, and United Electric has neither the possibility of acquiring more nor the ability to develop deep coal reserves." (App. 65a.) While the government pretends that the appellees "apparently" rely "solely" upon the testimony of Mr. Camicia with respect to United Electric's lack of any

deep mining potential (Govt. Brief, p. 7), and that of Mr. Organ with respect to the non-availability of strip reserves (*id.* p. 3), appellees, of course, do no such thing. Like the District Court, appellees rely on all of the evidence on these issues provided by a host of witnesses and exhibits.

Just how overwhelming this evidence is may be seen by contrasting the arguments in the government's present brief with the testimony of the only witness called by the government to testify at trial concerning these issues, Mr. Hopper of Ayrshire Collieries:

1. While the government would have this Court believe that there is an abundance of strip reserves available to United Electric (Govt. Brief, p. 5), government witness Hopper verified that "it is common knowledge within the coal industry that strip reserves available for acquisition are in extremely short supply. . . ." (Hopper Tr. 1892.)[1]

2. Though the government chides United Electric for failing to acquire the Belle Rive and Edison properties and claims that United Electric's post-merger management was generally lax in its reserve acquisition efforts (Govt. Brief, p. 4), its witness Hopper testified that his own company

[1] The Court should not be misled by the government's citation to the data of the Illinois State Geological Survey. Mr. Simon, the Principal Geologist of the Illinois State Geological Survey, testified at trial that, by itself, this data "certainly couldn't be used to support" the government's contention that United Electric will be able to acquire additional economically mineable strip reserves in Illinois to continue its mining operations beyond the time when its existing strip reserves are exhausted. (Simon Tr. 62-63; see also Simon Tr. 45.) Indeed, even the government's own economist conceded in the closing days of the trial that the "record indicates that high quality strip reserves are relatively scarce in Illinois." (Folsom Tr. 2476.) Summing up the trial record on this issue, the District Court stated that "[e]vidence was presented at trial by experts, by state officials, by industry witnesses and by the Government itself indicating that economically mineable strip reserves that would permit United Electric to continue operations beyond the life of its present mines are not available." (App. 63a.)

and others had passed up these same properties as having no potential (Hopper Tr. 1881, 1885) and that United Electric's exploration activities in these areas were "a clear indication that they were attempting to find and presumably acquire additional reserves." (*Id.* 1886.)[2]

3. While the government would like to dismiss the expert report and judgment of the mining engineering firm of Paul Weir Company with respect to the lack of competitive potential of the Industry Field,[3] the lack of available midwest strip reserves and United Electric's inability to undertake deep mining (DX 87) as a "litigation report" prepared by a "litigation consultant" (Govt. Brief, pp. 5-6), government witness Hopper acknowledged that the "Paul Weir Company is one of the world's most widely known and highly regarded mining engineering companies" and went on to vouch for its "very fine reputation." (Hopper Tr. 1894.)

---

[2] The record is totally at odds with the government's intimation that United Electric was somehow held back in its reserve acquisition efforts. Mr. Camicia testified that while he was president of United Electric he had a "blank check" to acquire whatever strippable reserves could possibly be found. (Camicia Tr. 1399.) Similarly, Mr. Inman, who had been United Electric's Vice President of Operations, stated that he had had an "open book" with respect to the expenditure of funds on the acquisition of coal reserves (Inman Dep. 205; see also Morris Tr. 536.) The wide latitude which United Electric's personnel were given in their search for additional strip reserves was emphasized by Mr. Camicia at trial: "I didn't even put any reservations on it. I just said find some coal that could be stripped, and then I would decide whether it was worth buying or not. Anything that can be stripped, just so it is black." (Camicia Tr. 1440.)

[3] As the government well knows, the Paul Weir testimony fully detailed the reasons why the 1959 hopes that competitive conditions would in time permit the profitable development of the Industry Field were never realized. Mr. Weir explained that because of the unfavorable profit experience at other mines in the area, changes in the competitive situation in the coal fields and other factors, "the picture is still dark for development of Industry." (Weir Dep. 138-39.) "The coal industry today is not the same coal industry that we had ten years ago, and we have learned certain things about mining in this area, and these cannot help but be reflected in our thinking. . . ." (*Id.* 144.)

4. The government criticizes Mr. Camicia for his belief that Ayrshire had made a mistake in entering deep mining and suggests that United Electric would have no trouble doing so. (Govt. Brief, p. 7.) Government witness Hopper, however, testified that if Ayrshire had it to do over again it would "absolutely not" open its Thunderbird deep mine (Hopper Tr. 1881) and that United Electric "would be in a very awkward position" were it to attempt underground mining. (*Id.* Tr. 1903.)

5. Finally, the government's rose-colored vision of what the future would hold for an independent United Electric also stands in sharp contrast to the views of its witness Hopper. When asked during cross examination whether, in his professional opinion, it would be a mistake to force a company in United Electric's condition to operate independently in the belief that strip reserves were available which would enable the company to remain in business in the future at its current levels of production, Mr. Hopper responded: "Well, it would be my opinion that they would be in a very poor position to live up to the situation that they had been placed in, because I very seriously doubt that they could acquire additional reserves to that extent to maintain that sort of production over a prolonged period of time." (Hopper Tr. 1902.) In view of such testimony *from the government's own witness,* it is not surprising (let alone reversible error) that the District Court rejected the suggestion that it resurrect an independent United Electric whose future prospects were tied to nothing more than the unschooled speculations of government counsel below—repeated here (Govt. Brief, p. 3)—that "what is not economically viable today may become so tomorrow." The District Court quite properly preferred the considered opinions of geologists, mining engineers, experts, state officials, coal consumers, and coal producers who had spent their life-

time in the coal business to such *ipse dixit* forecasts by attorneys whose experience in the field began with this litigation.

The testimony of the government's only witness on these issues was thus squarely against it, and corroborated the record evidence introduced by defendants on these same issues from dozens of witnesses and scores of exhibits. There can be no doubt then that the trial court's opinion is supported by substantial evidence and would not be reversed upon a plenary review.

Try as it may, there is simply no way the government can overcome the fact that the decision below turned on the resolution of a host of complex and disputed *evidentiary* issues peculiarly within the province of the trier of fact. Since the decision below was clearly correct, involved no departure from existing Section 7 precedent, and presents no legal issues that were either material or substantial, the decision below should be summarily affirmed.

Respectfully submitted,

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
2900 Prudential Plaza
Chicago, Illinois 60601

KIRKLAND & ELLIS
Chicago, Illinois

ALBERT E. JENNER, JR.
Room 3300
135 So. La Salle St.
Chicago, Illinois 60603

JENNER & BLOCK
Chicago, Illinois

Of Counsel

Attorneys for Defendants

November 8, 1972

FILED
OCT 22 1973
MICHAEL RODAK, JR., CLERK

No. 72-402

In the Supreme Court of the United States

OCTOBER TERM, 1972

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

BRIEF FOR THE UNITED STATES

ERWIN N. GRISWOLD,
Solicitor General,

THOMAS E. KAUPER,
Assistant Attorney General,

DANIEL M. FRIEDMAN,
Deputy Solicitor General,

MARK L. EVANS,
Assistant to the Solicitor General,

CARL D. LAWSON,
JOHN R. WYNE,

Attorneys,
Department of Justice,
Washington, D.C. 20530.

INDEX

	Page
Opinion below	1
Jurisdiction	1
Questions presented	2
Statute involved	2
Statement	3
A. The coal industry	3
B. The acquiring company—General Dynamics, Material Service, and Freeman	7
C. The acquisition and the acquired company (United Electric)	8
D. Competition between the acquiring and the acquired companies	11
E. The proceedings below	11
Summary of argument	13
Argument:	
I. Coal is an appropriate line of commerce for determining the competitive effects of the acquisition	20
A. Coal satisfies Brown Shoe's "practical indicia" of an "economically significant submarket"	21
1. Coal is recognized as a separate economic entity	21
2. Coal has peculiar characteristics and uses	22
3. Coal has unique production methods and facilities	22
4. Coal has distinct prices	24

495-300—73——1

Argument—Continued

Page

5. Coal has distinct customers and its prices are relatively insensitive to changes in the price of other fuels.... 25

B. The district court's conclusion that energy is the exclusive relevant line of commerce rested upon a misunderstanding of *United States* v. *Continental Can Co.*, 378 U.S. 441.. 33

II. Illinois and the Eastern Interior Coal Province sales area are appropriate sections of the country for determining the competitive effects of the acquisition..... 35

A. The geographic markets proposed by the government correspond to the realities of the coal industry and are economically significant..... 36

1. The Eastern Interior Coal Province sales area is a relevant section of the country..... 37

2. Illinois is a relevant section of the country..... 39

3. The district court erred in rejecting these areas as relevant sections of the country..... 42

B. The geographic markets the district court adopted are improper, but in any event they do not negate the broader markets of Illinois and the Eastern Interior Coal Province sales area..... 44

Argument—Continued Page

III. The effect of the acquisition may be substantially to lessen competition in the relevant markets 50

A. A horizontal merger is illegal under Section 7 if it significantly increases concentration in a concentrated market 50

B. Under these criteria the Freeman-United Electric combination is unlawful 54

1. The market is concentrated and the trend is toward further concentration 54

2. The merger is *prima facie* unlawful because it produces a firm with an undue percentage share of these concentrated markets and significantly increases concentration there 57

C. The acquisition is also illegal because it eliminates substantial competition between Freeman and United Electric 60

D. The merger cannot be justified on the ground that, because of inadequate reserves, United Electric no longer was a significant competitive factor in the coal business 63

1. The claim that the merger would not substantially lessen competition because the acquired company had "inadequate resources" to remain a significant competitor must be tested by the general legal standards that govern the "failing company" defense 63

Argument—Continued Page

2. The district court did not find, and the record does not show, that at the time of the acquisition United Electric was about to go out of business and could not be rehabilitated 70

Conclusion 75

CITATIONS

Cases:

Brown Shoe Co. v. *United States*, 370 U.S. 294 ..... 14, 21, 32, 35, 36, 44, 51, 63, 64, 65

Citizen Publishing Co. v. *United States*, 394 U.S. 131 ..... 65, 67, 68, 69, 74

Federal Trade Commission v. *Procter & Gamble Co.*, 386 U.S. 568 ..... 56, 69

Federal Trade Commission v. *Consolidated Foods Corp.*, 380 U.S. 592 69

International Shoe Co. v. *Federal Trade Commission*, 280 U.S. 291 ..... 63, 69

Kennecott Copper Corp. v. *Federal Trade Commission*, 467 F. 2d 67, petition for certiorari pending, No. 72-637 31

Tampa Electric Co. v. *Nashville Coal Co.*, 365 U.S. 320 ..... 43, 50

United States v. *Aluminum Co. of America*, 377 U.S. 271 ..... 32, 35, 53

United States v. *Bethlehem Steel Corp.*, 168 F. Supp. 576 48

United States v. *Continental Can Co.*, 378 U.S. 441 ..... 15, 21, 32, 33, 34, 35, 51, 52, 54, 57, 58, 59, 69

United States v. *El Paso Natural Gas Corp.*, 376 U.S. 651 ..... 1, 41

Cases—Continued Page

United States v. *Greater Buffalo Press, Inc.*, 402 U.S. 549 ..... 68, 69

United States v. *Pabst Brewing Co.*, 384 U.S. 546 ..... 36, 41, 45, 52, 53, 54, 55–56, 58

United States v. *Penn-Olin Chemical Co.*, 378 U.S. 158 69

United States v. *Philadelphia National Bank*, 374 U.S. 321 ..... 40, 41, 50, 51, 52, 59, 60, 63

United States v. *Third National Bank in Nashville*, 390 U.S. 171 ..... 65, 68

United States v. *Von's Grocery Co.*, 384 U.S. 270 ..... 52, 53, 54, 55, 58

Statutes:

Bank Merger Act of 1966, 80 Stat. 7, 12 U.S.C. 1828(c) 64

Bituminous Coal Act of 1937, 50 Stat. 72, 78, 15 U.S.C. 833 ..... 16, 39–40

Clayton Act, Section 7, 38 Stat. 831, as amended, 64 Stat. 1115, 15 U.S.C. 18 ..... passim

Expediting Act, Section 2, 15 U.S.C. 29 1

Miscellaneous:

Fortune Magazine, May 15, 1969 7

In the Supreme Court of the United States

OCTOBER TERM, 1972

No. 72-402

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

BRIEF FOR THE UNITED STATES

OPINION BELOW

The opinion of the district court (J.S. App. 1a–66a) is reported at 341 F. Supp. 534.

JURISDICTION

The opinion and judgment of the district court was filed on April 13, 1972. The notice of appeal to this Court (J.S. App 67a–68a) was filed on June 7, 1972. Probable jurisdiction was noted on December 11, 1972. The jurisdiction of this Court rests on Section 2 of the Expediting Act (15 U.S.C. 29). *United States* v. *El Paso Natural Gas Corp.*, 376 U.S. 651.

QUESTIONS PRESENTED

1. Whether, under Section 7 of the Clayton Act, coal is a relevant line of commerce for determining the competitive effects of the combination of two coal producers, who were the second and fifth largest coal producers in Illinois and the second and sixth largest in the Eastern Interior Coal Province sales area.

2. Whether Illinois and the Eastern Interior Coal Province sales area are relevant sections of the country for determining the competitive effects of such a combination.

3. Whether, in this line of commerce and in these sections of the country, the effect of the combination may be substantially to lessen competition.

4. Whether the district court applied an erroneous legal standard in ruling that the merger would have no anticompetitive effect because, at the time of trial, the acquired company was not a viable competitive force in the market due to its lack of adequate coal reserves.[1]

STATUTE INVOLVED

Section 7 of the Clayton Act, 38 Stat. 731, as amended, 64 Stat. 1125, 15 U.S.C. 18, provides in pertinent part:

> No corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital and no corporation subject to the jurisdiction of the Fed-

[1] This question is a revision of the fourth question presented in the jurisdictional statement. The focus has been shifted from the evidentiary support for the finding to its legal sufficiency as a basis for concluding that the merger would have no anticompetitive effect. The latter issue was raised in both the jurisdictional statement and the brief in opposition to the motion to affirm. See note 47, *infra*, p. 70.

eral Trade Commission shall acquire the whole or any part of the assets of another corporation engaged also in commerce, where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly.

* * * * *

STATEMENT

The United States instituted this civil antitrust case, charging that the acquisition of the stock of United Electric Coal Companies ("United Electric"), by Material Service Corporation ("Material Service") and its successor, General Dynamics Corporation ("General Dynamics"), violated Section 7 of the Clayton Act (15 U.S.C. 18). It alleged that actual and potential competition in the Illinois and Eastern Interior Coal Province sales area coal markets may be substantially lessened by the acquisition. After a trial on the merits, the district court held there was no violation.

A. THE COAL INDUSTRY

The coal industry has undergone a substantial transformation since the Second World War. It lost the railroad market entirely to diesel fuel. It lost most of the home heating market and a substantial portion of the industrial market to gas and oil (J.S. App. 11a–12a). From 1947 to 1954, total coal production in the United States decreased more than a third.[2] Since

[2] Production was 441 million tons in 1947 and 278 million tons in 1954 (DX 85, A. Ex. 657). The appendix volumes containing exhibits have been separately paginated. "A. Ex." references are to the exhibit volumes. "A." references are to the other appendix volumes.

1954 the electric utility market has become the mainstay of the coal industry, accounting by 1968 for 71 percent of the national coal consumption (DX 85, A. Ex. 657).

This change in markets has not, however, led to the disappearance of the coal industry. On the contrary, the utilities' rapidly increasing energy demands have stimulated a resurgence of coal production since the low point of 1954. By 1968, United States coal production was up nearly to the 1947 level (DX 85, A. Ex. 657), and the Bureau of Mines estimates that production will continue to increase at the rate of 3.1 percent per year through 1980 (GX 232, A. Ex. 152).

Coal usage by electric utilities varies among different areas of the country. Utilities on the east and west coasts use substantial amounts of oil, but almost no oil is used in the interior of the country. Natural gas is used in most states west of the Mississippi, and is the principal fuel for utilities in the southwest and south central states; but very little gas is used east of the Mississippi. Coal is the dominant fossil fuel[3] for utilities east of the Mississippi and south and west of New York, and it supplies more than half of the requirements of utilities in the New York-New England, west north-central, and mountain areas.[4]

---

[3] Fossil fuels are hydrocarbon energy sources which have been mineralized through geological ages and are extracted from the earth. They include various forms of coal, natural gas, and petroleum.

[4] In 1966 oil accounted for 18 percent of the BTUs of fossil fuel consumed by utilities in the Pacific Coast area, 12 percent in the South Atlantic area, 21 percent in the Mid-Atlantic area, 42 percent in the New England area, and

Bituminous coal is found in four major producing areas in the United States. The area involved in this case—commonly known as the Eastern Interior Coal Province (A. 680–681)—is composed of the central and southern two-thirds of Illinois and much of southwestern Indiana and western Kentucky. The other areas are: the Appalachian or Eastern Coal Province, encompassing Pennsylvania, West Virginia, eastern Kentucky, and parts of Ohio, Tennessee, and Alabama; the Western Interior Coal Province, comprising parts of Iowa, Kansas, Missouri, and Oklahoma; and the Western Province, consisting of scattered deposits in Montana, Wyoming, Colorado, and Utah (Kurtz Dep. Ex. 10, A. Ex. 1657.) (Anthracite and lignite coal deposits, which are not involved in this case, are respectively located east of the Appalachians and in Montana and the Dakotas. *Ibid.*)

High transportation costs, which may approach 30 to 40 percent of the delivered price of coal (J.S. App. 57a), tend to insulate coal producers in one producing area from competition from mines in other producing areas. Although the Eastern Interior Coal Province produced approximately one-fourth of the coal sold in

---

less than 2 percent in each of the interior states except Utah and Montana. Natural gas accounted for more than 90 percent of the BTUs consumed by utilities in Kansas, Oklahoma, Arkansas, Texas, Louisiana, and Mississippi, and more than 80 percent in California and Arizona, but it represented less than 6 percent of the BTUs consumed by utilities east of the Mississippi River. Coal accounted for more than 90 percent of the BTUs consumed by utilities in all the states east of the Mississippi and south or west of New York except New Jersey, Delaware, South Carolina, Florida, and Mississippi. (Kurtz Dep. Ex. 10, A. Ex. 1658–1659.)

the United States in 1967, coal from that area did not account for any of the reported sales in the northeast and far west and accounted for less than 10 percent of coal sales even in the relatively nearby states of Michigan and Ohio. At the same time, more than 90 percent of the non-metallurgical coal [5] sold in Indiana and Illinois and more than half of that sold in Minnesota, Wisconsin, Iowa, Missouri, and Kentucky was produced in the Eastern Interior Province (Gallagher Dep. Ex. 3, A. Ex. 1424–1447).

All of the mines of the acquired and acquiring companies are located in Illinois within the Eastern Interior Coal Province, where the leading producers have accounted for an ever-increasing share of the coal production. The following table shows the increase in the percentage shares of coal production by the leading producers in a recent 10-year period:

	Eastern Interior Coal Province		Illinois	
	1957	1967	1957	1967
Top 2 firms	29.6	43.6	27.8	32.9
Top 4 firms	43.0	62.9	34.5	75.2
Top 10 firms	65.5	91.4	84.0	98.0

This period was also marked by a sharp decline in the number of producers. Although 144 companies were producing coal in the Illinois portion of the producing area in 1957, only 39 companies remained in 1967 (GX 73, A. Ex. 92).

[5] Metallurgical coal is used in coke production for metallurgical purposes. Illinois mines produce only 4 million tons of such coal annually out of a total production of almost 65 million tons (GX 210, A. Ex. 135). Coal used for all other purposes is termed nonmetallurgical coal.

B. THE ACQUIRING COMPANY—GENERAL DYNAMICS, MATERIAL SERVICE, AND FREEMAN

General Dynamics is a large and diversified company; it ranked 27th among industrial corporations in the United States in 1968, with total sales of more than $2.6 billion (*Fortune Magazine,* May 15, 1969, p. 168). It became the Nation's fifth largest coal miner as a result of its acquisition in 1959 of Material Service, which was then engaged in producing and supplying building materials, coal, and limestone (J.S. App. 2a–3a). Material Service had, since 1942, owned all of the capital stock of Freeman Coal Mining Corporation ("Freeman") (J.S. App. 3a, 4a).

Freeman's mining operations have always been centered in southern Illinois. It operated three mines in that area at the time this action was filed and had opened a fourth by the time of trial. It also operated the Crown Mine in central Illinois. All of the Freeman mines are deep mines. (J.S. App. 4a, 6a.)

In 1959 Freeman produced 6.9 million tons of coal—approximately 15 percent of Illinois production (GX 64, A. Ex. 83) and 8 percent of Eastern Interior Coal Province production (GX 77, A. Ex. 96). It was the second largest producer in each area. In 1967 it produced 8.4 million tons—approximately 13 percent of Illinois production (GX 72, A. Ex. 91) and 6 percent of Eastern Interior Coal Province production (GX 85, A. Ex. 98). Freeman's production is 92 percent nonmetallurgical coal (A. 1529–1530). At the time of trial it controlled approximately 484 million tons of deep coal reserves in Illinois (DX 61, A. Ex. 577).

C. THE ACQUISITION AND THE ACQUIRED COMPANY (UNITED ELECTRIC)

Material Service began acquiring United Electric stock in 1954 and had increased its holdings to 34 percent by 1959 when Freeman's president, Frank Nugent, was elected Chairman of United Electric's Executive Committee (J.S. App. 7a–8a). General Dynamics acquired Material Service a few months later and continued to acquire United Electric stock. General Dynamics had increased its holdings to 66 percent of United Electric's stock by September 1966, when it made a successful tender offer for the remaining shares. United Electric became a wholly-owned subsidiary of General Dynamics at the beginning of 1967. (J.S. App. 8a–9a.)

United Electric has operated mines in various parts of Illinois and western Kentucky since it was formed in 1919. At the beginning of 1959 it operated one mine in Kentucky and four in Illinois, and at the time of trial it was operating only four in Illinois. All of these mines were open pit or strip mines; United Electric has not operated a deep mine of any kind since 1954. (J.S. App. 6a–7a.)

From at least 1955 through the time of trial United Electric has been a healthy company with a good financial record and a secure future. It has been one of the leading coal producers in the Eastern Interior Coal Province, and its production increased from 3.6 million tons in 1957 to 5.7 million tons in 1967 (GX 62–72, A. Ex. 81–91). This average annual growth rate of 5.1 percent is higher than the average for producers in the State of Illinois (3.4 percent) and in the Province as a whole (3.6 percent) (DX 87, A. Ex. 783, GX 86, A. Ex. 100). During a comparable period,

United Electric's share of the total State and Province production remained relatively stable. In 1959 it accounted for 8.1 percent of Illinois production and 4.8 percent of Province production (GX 64, A. Ex. 83, GX 77, A. Ex. 77); in 1967 the figures were 8.9 percent and 4.4 percent (GX 72, A. Ex. 91, GX 85, A. Ex. 98).*

United Electric has consistently had one of the highest profit margins in the coal industry. It led the industry in operating income as a percentage of revenues in 9 out of 11 years from 1955 through 1965, as shown in a Standard & Poor's survey of 13 major coal companies (GX 26, A. Ex. 24). From 1959 through 1967, the company had total profits of $24.1 million on sales of $181.2 million (GX 25, A. Ex. 12). Freeman had profits of $15.8 million on sales of $289.9 million during the same period (Nugent Dep. Exs. 1–9, A. Ex. 1741–1763).

In 1959, United Electric had a net worth of $19.6 million, working capital of $2.8 million, and long-term debt of $1.2 million (GX 24, A. Ex. 11). By 1968, despite the payment of $11 million in dividends to General Dynamics (Nugent Dep. Ex. 22, A. Ex. 1774–1775, GX 27, A. Ex. 29–31), United Electric had eliminated all its long-term debt, had increased its net worth to $26.9 million, and had accumulated $10.7 million in working capital (GX 34, A. Ex. 41).

In 1970, United Electric owned or leased an estimated 52 million tons of strip reserves in its existing mines (J.S. App. 9a). Assuming that no other reserves

* In 1959, United Electric was the fifth largest producer in the State and the sixth largest in the Province; in 1967, it was sixth in the State and ninth in the Province (GX 64, A. Ex. 83, GX 72, A. Ex. 91, GX 77, A. Ex. 96, GX 85, A. Ex. 98).

around these four mines are acquired, the mines would continue as of 1969 to produce at that year's levels for 2, 7, 9, and 16 years, respectively (DX 60C, A. Ex. 544–572, DX 60D, A. Ex. 573).[7] The company also owns 12.6 million tons of strip reserves in a field that contains an estimated 25 to 50 million tons of coal (DX 60A, A, Ex. 517, A. 1142, Morris Dep. Ex. 31, A. Ex. 1686–1687). These reserves will in time be economically mineable (Kolbe Dep. Ex. 59, A. Ex. 1552, GX 201, A. Ex. 133, A. 54–55, 182, 204, but see A. 1528).

Apart from strip reserves, United Electric owns about 44 million tons of deep reserves (DX 60A, A. Ex. 517) and controls by location[8] another 40 to 50 million tons (A. 1055–1056, 1103–1105, DX 60A, A. Ex. 517).[9]

---

[7] The district court found that all but four million tons of the estimated reserves have been committed under long-term contracts (J.S. App. 9a, 65a). The defendants' own exhibit, however, shows that nearly 11 million tons classified by the court as "committed" are committed only to "Current Negotiations" (DX 63, A. Ex. 579). Moreover, most of the actual commitments were made after the acquisition and after this action was filed. United Electric entered into a 20-year contract for approximately 21 million tons in 1968 (A. 1204, DX 35, A. Ex. 262, DX 63, A. Ex. 579).

[8] Reserves contiguous to those owned, leased, or optioned are "controlled by location" if, in order to be mined at all, they must be mined by the holder of the rest of the reserves in the area (A. 87).

[9] While the district court stated that United Electric now lacks the ability to mine these deep reserves (J.S. App. 65a), the company has the financial resources necessary to embark on a deep mining operation, and the court made no finding that the company could not have obtained the necessary expertise had it not been combined with Freeman (see pp. 72–73, *infra*).

D. COMPETITION BETWEEN THE ACQUIRING AND THE ACQUIRED COMPANIES

Both Freeman and United Electric sell coal in Wisconsin, Illinois, Kentucky, Iowa, and Missouri (GX 54–60, A. Ex. 73–79). As shown in the following table, the companies sell about half of their coal to the same customers and most of that is shipped to the same customer facilities (GX 88–91, A. Ex. 107–117):

	Year	Tons sold (thousands)	Percent of total sales to common customers	Percent of total sales to identical customer facilities
United Electric	1965	5,487	70.2	54.7
	1966	4,964	62.1	52.9
	1967	5,914	61.6	48.2
	1968	7,916	51.4	37.4
Freeman	1966	8,582	44.0	37.0
	1967	9,078	42.8	33.8

That Freeman and United Electric are actual and potential competitors was acknowledged by officials of the companies and by customers of each (A. 84, 131, 1437, GX 93, A. Ex. 118–119, GX 94, A. Ex. 121–123, GX 104, A. Ex. 124–125). Freeman and United Electric salesmen solicit many of the same customers (A. 48, 121).

E. THE PROCEEDINGS BELOW

The United States filed its complaint on September 22, 1967. The trial was held from March 30 to April 22, 1970, and the district court issued its opinion on April 13, 1972.

The government's theory was that the United Electric acquisition involved a merger of competing firms. It contended that coal is an appropriate line of com-

merce, and that Illinois and the Eastern Interior Coal Province sales area [10] are appropriate sections of the country in which to assess the competitive effects of the combination. The government's proof was directed to showing that the Freeman-United Electric combination had an inordinate share of those concentrated markets and was likely to produce substantial anti-competitive effects within them.

The district court rejected the government's proposed product and geographic markets. It held, after a lengthy discussion of interfuel competition in the electric utility market, that "the energy market is the appropriate line of commerce for testing the competitive effect of the United Electric-Freeman combination" (J.S. App. 53a). It also adopted the geographic markets proposed by the defendants. These consisted of the Commonwealth Edison Company, the Metropolitan Chicago Interstate Air Quality Control Region, and utility and non-utility sales areas for coal mines located in each of four different freight rate districts (J.S. App. 56a-59a).[11]

[10] The Eastern Interior Coal Province sales area—in which Province coal producers sell most of their coal—consists of Illinois, Indiana, the western half of Kentucky, the western one-third to one-half of Tennessee, the extreme eastern portion of Missouri on or near the Mississippi River, the eastern half of Iowa, southeastern Minnesota, and southern Wisconsin (see pp. 38-39, *infra*).

[11] The Interstate Commerce Commission has designated various coal producing areas within Illinois, Indiana, and western Kentucky as freight rate districts (J.S. App. 4a). The normal freight rates are uniform for all mines located in a particular freight rate district.

The district court also concluded that the government had failed "to show that a substantial lessening of competition resulted from the United Electric-Freeman combination" (J.S. App. 60a). The court's conclusion that there was no substantial anticompetitive effect rested on subsidiary findings (a) that United Electric's strip coal reserves are committed and the government did not show that additional economically mineable strip reserves are presently available (J.S. App. 63a), (b) that United Electric did not have the skill to mine its deep reserves (J.S. App. 65a), and (c) that United Electric and Freeman do not compete but are "predominantly complementary in nature" (J.S. App. 61a) because of their different mining techniques, because Freeman produces some dust and metallurgical coal while United Electric does not, because Freeman produces some coal that has a lower sulphur content than United Electric coal, and because Freeman and United Electric mines are located in different freight rate districts (J.S. App. 61a–62a). The court therefore concluded that the United Electric-Freeman affiliation "is not adverse to competition, nor would divestiture benefit competition" (J.S. App. 66a).

SUMMARY OF ARGUMENT

I

A. The district court held that "energy" is the exclusive line of commerce for determining the competitive effects of this combination of two coal companies. Section 7 of the Clayton Act, however proscribes a

merger if it may substantially lessen competition in *any* line of commerce. Even if energy is an appropriate product market, coal satisfies the "practical indicia" of an "economically significant submarket," as defined by this Court in *Brown Shoe Co.* v. *United States,* 370 U.S. 294, 325.

Coal is recognized by the industry, by governmental authorities, and by the public as a separate economic entity. It is physically different from other forms of energy, its heat producing qualities are unique, and it is used for a narrower range of commercial purposes than other fuels. Its mining and production techniques are unlike those for oil, natural gas, and nuclear fuel. In the areas served by Freeman and United Electric, coal is sold at a delivered price per BTU significantly lower than that for competing fuels.

Because of its low price, coal is overwhelmingly preferred as a fuel by those consumers—particularly steam-electric utilities—for whom fuel expenses are the principal cost of doing business. In the areas involved in this case coal has had minimal competition from other fuels for the business of this narrow class of consumers, producing, for example, 90 percent of the BTUs consumed by steam-electric utilities in Illinois. It is likely to maintain its substantial competitive advantage in these areas, where major coal deposits are located.

Just as coal's advantages make it attractive to utilities and other industrial fuel consumers, its commercial and aesthetic disadvantages make it unattractive to other consumers. Highway, air, and rail transporta-

tion are dependent on liquid fuels; consumer preference for gas and oil, despite higher prices in many areas, make coal an ineffective competitor in the space-heating market. Fluctuations in the price of other fuels are not likely to affect the delivered price of coal.

B. The district court's holding that "*the* relevant line of commerce must encompass interfuel competition" (J.S. App. 55a, emphasis added), rests upon a misunderstanding of *United States* v. *Continental Can Co.*, 378 U.S. 441. That case involved a merger of a metal container producer and a glass container producer, and the Court held that, because of the substantial interindustry competition between the two products, the combined metal and glass container industries constituted an appropriate line of commerce. *Continental Can* dealt only with how broadly, not how narrowly, the product market may be drawn. The decision does not imply that, in evaluating a merger between two coal companies, the *only* revelant market must include other competing fuels. Indeed, the Court in *Continental Can* recognized that, in addition to the combined glass and metal market, each of those industries separately would be an appropriate product. Here, too, regardless of whether energy may be a relevant line of commerce, coal is an appropriate submarket.

II

A. The government showed that the United Electric-Freeman combination may substantially lessen competition in two sections of the country—the Eastern Interior Coal Province sales area and the State of

Illinois. Each corresponds to the competitive realities of the coal industry, and each is an appropriate geographic market.

There are four major coal producing regions or provinces in the country, and producers in one tend to be insulated from competition by producers in another. Because of transportation costs, which may be 30 to 40 percent of the delivered price of coal, the competitive sales area for producers within a region generally conforms to the geographic range beyond which the delivered price is higher than that for coal originating in another province. The Eastern Interior Province, where all the Freeman and United Electric mines are located, is a geographically distinct coal producing region, and producers there enjoy a competitive advantage over producers in other provinces with respect to sales in an identifiable area comprising Illinois and Indiana and parts of Kentucky, Tennessee, Iowa, Minnesota, Wisconsin, and Missouri. Nearly all the coal used by steam-electric utilities in this sales area is produced in the region, and more than 80 percent of the coal produced in the region is consumed in the sales area. Freeman and United Electric sell almost all their coal to customers in the sales area, and each has shipped coal to almost every State within the area.

Within this broader market, Illinois is an appropriate submarket. The State has been a separate mining district under the Bituminous Coal Act of 1937, its production figures are separately reported by the Bureau of Mines, and all the Freeman and

United Electric mines are located within its boundaries. Illinois consumers buy most of their coal from Illinois producers (90 percent in the case of utilities), and Illinois mines sell most of their coal (about 60 percent) to Illinois customers. Freeman and United Electric sell more coal in Illinois than in any other State.

B. Appellees' ten geographic markets, which the district court adopted, do not reflect the competitive realities of the coal business. Instead of focusing on the area of competitive overlap between Freeman and United Electric in which the impact of the acquisition would be most direct and immediate, the district court erroneously adopted geographic markets that ignore the areas of competitive overlap.

In any event, Section 7 proscribes mergers with anticompetitive effects in *any* section of the country. Even if the district court's geographic markets were appropriate, they do not negate the existence of one or more broader markets—here, the Province sales area and Illinois—within which the combination may substantially lessen competition.

III

A. Under Section 7 a horizontal merger is *prima facie* unlawful if it produces a firm controlling an undue percentage share of the market and significantly increases concentration in the market. While no specific percentage share is necessarily "undue," this Court has applied the principle of *prima facie* illegality in mergers involving combined shares as small as

4.5 percent, 7.5 percent, and 11 percent, where concentration in the relevant markets had been rapidly increasing.

B. In both the Eastern Interior Coal Province and the State of Illinois, concentration levels prior to the 1959 acquisition were greater than the pre-merger levels in markets this Court has considered sufficiently concentrated to bar mergers producing relatively small combined shares. Between 1957 and 1967 the concentration levels in those areas rapidly increased while the number of producers in Illinois decreased from 144 to 39. The acquisition of United Electric, whether viewed as of 1959, when Material Service took control, or as of 1967, when General Dynamics became the sole shareholder, brought together two of the leading producers in each of these concentrated markets. The combined shares of coal production in the Province (12.4 percent in 1959) and Illinois (23.2 percent in 1959) exceed or approach the shares this Court has held *prima facie* unlawful for concentrated markets. Moreover, the acquiring company significantly increased its share of the markets, and the acquisition resulted in substantial increases in market concentration.

C. Apart from this structural data showing that the acquisition resulted in an undue combined percentage share of the relevant markets, the combination eliminated substantial direct competition between Freeman and United Electric. The companies sell about half their coal to common customers, and most of those sales are to identical customer facilities. Salesmen of the companies solicit the same customers.

D. The district court held, however, that the merger would have no anticompetitive effect because United Electric's coal reserves were so inadequate that the company could not continue as a viable competitor in the market. This claim of inadequate resources rests on the same economic premise as the "failing company" defense—that elimination of a firm does not substantially lessen competition if the firm would not otherwise have been a viable enterprise. Although an "inadequate resources" defense requires a different factual showing, it must be tested by the same general legal standards applied in failing company cases.

A failing company defense requires a showing that, prior to the acquisition, every reasonable method of economic rehabilitation was explored but found unavailable and that the acquiring company was the only available purchaser. Similarly, in the case of an extractive industry, a defense based on the claim that the acquired company's resources were virtually exhausted requires a showing that there was no alternative method of prolonging the company's life, including sale to other purchasers.

This Court has recognized that the validity of a failing company defense must be determined as of the time of the acquisition, not the time of trial. The district court's findings with respect to United Electric's lack of coal reserves do not sustain an "inadequate resources" defense because they do not relate to United Electric's viability in 1959, when Material Service took control of the company, or in 1967, when General Dynamics became the sole shareholder. There is no finding, and the record does not show, that United

Electric's reserves in 1959 or 1967 were so depleted that the company was about to go out of business; that United Electric could not have acquired additional strip reserves after 1959 or 1967; or that United Electric could not have acquired deep-mining expertise if it had not become affiliated with Freeman (a deep mining company). It is unlikely that a firm as large and successful as United Electric would have allowed its coal business to disappear. Moreover, there is no finding that United Electric explored other less anticompetitive means of solving its reserve problems. In particular, the record does not establish that Material Service was the only available purchaser with access to additional coal reserves.

ARGUMENT

I

COAL IS AN APPROPRIATE LINE OF COMMERCE FOR DETERMINING THE COMPETITIVE EFFECTS OF THE ACQUISITION

The district court held that "the energy market is the appropriate line of commerce for testing the competitive effect of the United Electric-Freeman combination" (J.S. App. 53a). A merger violates Section 7 of the Clayton Act, however, if it has the proscribed anticompetitive effect "in any line of commerce." The proper inquiry in determining the market in this case, therefore, is not whether the energy market is "the" appropriate line of commerce, but whether coal is "an" appropriate line.

There may well be an energy market that would be an appropriate line of commerce for testing the com-

petitive effect of a merger between companies operating in different segments of that market. Cf. *United States* v. *Continental Can Co.*, 378 U.S. 441. But the possibility of that broader market is not inconsistent with and does not negate the existence of a narrower coal market as an appropriate line of commerce for determining the validity of a merger between companies engaged solely in that business. For "within this broad market, well-defined submarkets may exist which, in themselves, constitute product markets for antitrust purposes" (*Brown Shoe Co.* v. *United States*, 370 U.S. 294, 325). Coal is such a submarket.

A. COAL SATISFIES BROWN SHOE'S "PRACTICAL INDICIA" OF AN "ECONOMICALLY SIGNIFICANT SUBMARKET"

The Court in *Brown Shoe* stated (*ibid.*):

> The boundaries of such a submarket may be determined by examining such practical indicia as industry or public recognition of the submarket as a separate economic entity, the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors. * * *

A realistic appraisal of these "practical indicia" of a discrete product shows that coal is an "economically significant submarket" (*ibid.*) for purposes of Section 7.

1. Coal is recognized as a separate economic entity.

Coal is classified as a separate industry by the Office of Management and Budget (GX 29, A. Ex. 34). The industry has its own trade associations, labor

unions, and trade publications (A. 140). Federal and state agencies and various trade associations publish separate statistics on coal reserves, coal production, and coal shipment (see, *e.g.*, Gallagher Dep. Ex. 3, A. Ex. 1416–1455, Simon Dep. Ex. 1, A. Ex. 1810–1820, Terleke Dep. Ex. 11, A. Ex. 1841–1845).

2. Coal has peculiar characteristics and uses.

A lump of coal is quite different from any comparable unit of oil, uranium, or natural gas. The equipment necessary for burning coal differs from that for other fuels (See DX 150, A. Ex. 1110). Coal's thermal efficiency differs from that of other fuels (*ibid.*).[12] While the various fuels have generally similar end uses—the generation of energy or production of heat—because of coal's special advantages and disadvantages it is used principally by electric utilities and other industries in which fuel is a major cost factor; unlike gas and oil, coal is now rarely used for space heating or by the transportation industry (see pp. 25–27, *infra*).

3. Coal has unique production methods and facilities.

Coal is mined by the strip or open pit method, or by the deep or underground method. In strip mining the dirt, rock, and shale (overburden) overlying the coal seam is removed with large earth-moving machines and the coal is scooped up and hauled away with smaller pieces of equipment. The

[12] In power generation, coal requires between three and five percent fewer BTUs per kilowatt-hour than does gas; oil is less efficient than coal but more efficient than gas (DX 150, A. Ex. 1110).

coal is then sent to preparation plants which size the coal and improve its quality through a washing process (Kolbe Dep. Ex. 2, A. Ex. 1526–1529). There are three types of deep mining—the drift operation (punching or going into the coal seam from a hillside), the slope operation (removing coal by a conveyor belt going underground at 17 degrees or less to fairly shallow depths), and the shaft operation (using a deep vertical shaft through which coal is removed by hoists and skips) (A. 75–76, 1358–1359).

By contrast, natural gas and crude oil are channeled or pumped out of the ground through pipes. Crude oil is broken down into different distillates at highly complex computerized refineries (DX 81, A. Ex. 621, A. 463).[15] Natural gas either travels from the wellhead to the fuel burner through a series of pipelines or is liquified at a liquefaction plant and shipped or stored in tanks (A. 482–483). The production and processing of nuclear fuel is, of course, considerably more complex.[16]

---

[15] Residual oil—the only fuel oil used for electric generation in this country—is an oil-refinery by-product that remains after the more valuable refined liquids have been extracted and solids have been removed (DX 150, A. Ex. 1114).

[16] The nuclear fuel cycle involves the following steps: the ore is subjected to a milling process which increases the concentration of uranium oxide; the concentrate is converted to uranium hexafluoride, which is then enriched in gaseous diffusion plants; the enriched matter is converted to uranium dioxide pellets, which are inserted into specially manufactured zirconium tubing; the tubing is then fabricated into fuel elements which are assembled in the reactor as the core; spent fuel is reprocessed to recover the remaining usable uranium, plutonium, and other valuable isotopes (DX 116, A. Ex. 1043–1057).

4. Coal has distinct prices.

In the areas served by Freeman and United Electric, coal's delivered price per BTU is significantly lower than that for any other combustible fuel except interruptible natural gas, which is available only on a seasonal basis (GX 35, A. Ex. 35, GX 36, A. Ex. 47, GX 37, A. Ex. 53).[15] The president of Central Illinois Light Co., for example, testified that his company purchases coal for 27 cents per million BTUs and buys some refined oil for ignition fuel at 70 cents per million BTUs; the company's lowest firm rate for natural gas is 45 cents per million BTUs (A. 1207, 1210). The witness also testified that coal prices have been significantly lower than gas or oil prices for the last ten years and that he did not expect gas to approach the price of coal in the near future (A. 1209–1210). A cement company official stated that his company did not need to make any formalized surveys in order to determine which fuel to use. A cursory investigation revealed that the cost of coal was substantially less than the cost of gas or oil (GX 43, A. Ex. 63).[16]

---

[15] Gas is supplied at either a firm or an interruptible rate. Firm rate gas is substantially higher in price and approaches the price of purchased electricity (A. 740, 1116, GX 41, A. Ex. 60). Firm rate customers are supplied according to their needs, and they always have priority. Interruptible gas is sold at a lower rate and only when it is not required by firm rate customers (A. 1180–1181). In the midwest, interruptible gas is placed on the market only during the warmer months, and its availability varies among different locations (Morris Dep. Ex. 70, A. Ex. 1713, Kolbe Dep. Ex. 4, A. Ex. 1531, A. 475, 479, 483).

[16] Other witnesses attested to the price differential. A past president of United Electric stated that coal prices have been "much lower" than gas prices, and that United Electric used to sell a ton of coal for about $5 while an equivalent amount of

5. Coal has distinct customers and its prices are relatively insensitive to changes in the price of other fuels.

Coal's commercial advantages and disadvantages in the areas served by Freeman and United Electric make it attractive only to a distinctively limited set of potential customers. Coal is unable to compete for the business of some fuel consumers, but at the same time it has an overwhelming competitive advantage with respect to others. The preferences and requirements of consumers in the relevant geographic areas tend to minimize interfuel price competition, except at the geographic fringes, because price-oriented consumers prefer coal, while those for whom delivered price is secondary generally choose other fuels.

a. As the court below recognized, for many customers factors other than delivered price may control the choice of a fuel (J.S. App. 29a):

> The costs of storing, handling, and in some instances, disposing of the fuel by-products or residue, for example, are economic factors which can make a low-cost fuel the most expensive fuel. These costs become a particularly important consideration in selecting a proper fuel in locations where land costs are high and in heavily congested areas. In some areas, operating considerations, such as air pollution control regulations, may require a premium priced fuel and foreclose consideration of others.

Thus, the technology of highway and air transportation requires the use of liquid fuels, and because of

---

oil was selling for about $8 (A. 140–141). See, also, A. 279–280, 363, 574–575, GX 41, A. Ex. 60, GX 39, A. Ex. 59.

dieselization oil is now the fuel used in rail transportation (DX 102, A. Ex. 944). Simple consumer preference, rather than price, is the controlling factor in the space-heating market, where gas and oil are preferred despite their higher prices (DX 102, A. Ex. 981).

The capital investment in equipment necessary for the burning of coal is 10 to 15 percent greater than for the other fossil fuels (DX 150, A. Ex. 1110); and those industrial consumers for whom capital charges are more significant than fuel prices in relation to total fuel costs are more likely to choose another fuel (DX 102, A. Ex. 990).

For these groups of consumers, whose fuel choice is dictated primarily by considerations other than delivered price, coal is not an effective competitor unless other fuels are unavailable (see DX 150, A. Ex. 1110).

b. The market for coal is therefore effectively confined to electric utilities and other large fuel users, such as cement manufacturers, for whom the delivered price of fuel is the most significant portion of their total cost of doing business (*e.g.*, A. 811–812, GX 43, A. Ex. 63). Except for users of metallurgical coal, most coal consumers burn coal rather than another fuel because of its low price (A. 140, Morris Dep. Ex. 70, A. Ex. 1713).

For this limited class of consumers (or for that portion of a consumer's fuel requirements that are purchased on the basis of delivered price), coal has had minimal competition from other fuels in Illinois and the Eastern Interior Coal Province sales area. Thus, in each of the years 1960 to 1967, coal produced 90 to 94 percent of the BTUs consumed by steam-electric

utility plants in the Province sales area (GX 31, A. Ex. 33). Similarly, in 1967 coal provided 74 percent of the BTUs consumed by cement plants in the Province sales area and 94 percent of that consumed by such plants in Illinois (GX 32, A. Ex. 38–39). Most of the balance of the fuel consumed by these customers is interruptible natural gas (A. 740, GX 32, A. Ex. 39), which is available at a greatly reduced price on a seasonal basis only (see note 15, *supra*).[17] A former United Electric president stated in 1962 (Morris Dep. Ex. 70, A. Ex. 1713):

> We do not have any serious competition in the Midwest from oil for use in industrial and utility plants. We do have severe competition from natural gas when it is dumped at low prices during the summer months when there is no heating load. We feel, however, that with our mining methods and transportation costs, we can continue to hold our position with this competition. It is expected that with the diminishing reserves of gas and the possible higher prices, our competitive relationship with this fuel will improve.

c. Coal's dominance among utility and industrial consumers in the relevant portions of the midwest is not likely to disappear soon. The supply of natural gas is limited and some is being imported in liquified form for use during peak periods (A. 475–476). Gas companies serving the midwest are increasingly stor-

[17] Some oil is used by coal consumers for tasks that coal is not suited for, such as starting up boilers or kilns, and operating diesel units (A. 608, 637, 644, GX 36, A. Ex. 47, Redard Dep. Ex. 1, A. Ex. 1809).

495-300—73——3

ing gas in underground formations or liquified in tanks during low demand periods instead of selling it at the "dump" prices in those months (A. 217–218, 278, 443, 475–476, 481–482, 575, 741, 1209, GX 200, A. Ex. 132). Many coal consumers would not have the facilities to burn gas even if it were available and low-priced (A. 564, 665, DX 59, A. Ex. 509).

Nuclear energy is presently available commercially only for the generation of power, and is not a realistic alternative for non-utility coal consumers (A. 1250). In addition, because a nuclear power plant is different in design and construction from a conventional steam-electric power plant (A. 763, 1252), nuclear fuel is not an available option for use in existing fossil-fuel utility plants (A. 1250). At the time of trial Commonwealth Edison was the only company in the Province sales area that had an operational nuclear plant of commercial size (DX 107, A. Ex. 1004–1005), and nuclear energy accounted for less than one percent of electrical generation in Illinois in 1967 (Kurtz Dep. Ex. 8, A. Ex. 1651–1653).

Although, as the court below found (J.S. App. 34a–35a), newly constructed nuclear plants will account for an increasing share of electric power generation in the midwest, coal burning units will continue to provide a substantial portion. Only larger utilities can economically construct nuclear plants. Witnesses estimated that the minimum economic size of a nuclear power plant is 500 to 800 megawatts (A. 1200, 1239,

1273), and several utility officials stated that their companies' new units are too small for nuclear energy to be a feasible alternative (A. 1200).[18] Even a large utility does not build a 500 megawatt unit each time it expands; when it installs smaller units, it will have to choose among the fossil fuels (A. 1310). There is a continued demand for generating units of less than 500 megawatts in the midwest (Kurtz Dep. Ex. 8, A. Ex. 1654–1655).

Furthermore, large utilities that need additional generating capacity as quickly as possible are likely to choose a conventional plant. It takes as long as eight years to license and construct a nuclear facility and only three to four years to build a conventional unit (GX 232, A. Ex. 153, A. 1118). This need for expedition resulted in the construction of a new coal-fired unit by Commonwealth Edison (A. 1413).

There are other practical obstacles to the installation of nuclear facilities. Construction costs for nuclear plants have increased more rapidly than for coal-fired units (A. 762–763, GX 233, A. Ex. 168, GX 253, A. Ex. 195). Because the industry is still in its infancy, unforeseen difficulties in design, construction, and operation are not uncommon (see A. 676–677). One company revised its estimate of $83 million for a nuclear plant to $112 million because of delays and construction problems (A. 667–668). There are, in

[18] All but one of the 55 nuclear units for which contracts were awarded nationwide from 1967 to 1969 had capacities of at least 500 megawatts, and the average size of those units was nearly 900 megawatts (DX 107, A. Ex. 1005).

addition, problems of thermal pollution, which may be especially difficult to solve in colder climates (see A. 1436).[19]

It is therefore not surprising that announcements of new nuclear units have been declining. The following table shows that, with respect to announced steam-electric plant additions from 1965 through 1969, conventional units account for a growing, not shrinking, proportion of the capacity in the last four years (DX 107, A. Ex. 1007):

Year announced	Fossil		Nuclear		Total
	Megawatts	Percent	Megawatts	Percent	
1965	13,925	73	6,039	27	21,957
1966	20,096	47	22,477	53	42,573
1967	32,320	55	26,460	45	58,780
1968	34,620	62	14,802	26	39,422
1969	37,040	86	6,229	14	43,269
Total	139,984	63	75,978	37	205,962

d. Because of the substantial price advantage coal has over the other fossil fuels in the areas served by Freeman and United Electric, fluctuations in the delivered price of gas and oil are not likely to affect the delivered price of coal. Most coal consumers choose

[19] Two of the defendants' expert economists stated in another context (GX 232, A. Ex. 162):

"The problem of thermal pollution is especially severe for nuclear plants, which are, as yet, considerably less efficient than fossil-fueled plants. A nuclear plant converts about 25 percent less of the heat output into electric energy and, for an equal number of kilowatt hours, discharges about 50 percent more heat into the cooling water than does a fossil-fueled plant. This has already created some difficulties in obtaining construction permits for nuclear plants, and in one instance has necessitated the use of cooling towers."

coal because it is much cheaper and are unlikely to make a sudden switch on the basis of small or temporary reductions in the price of gas or oil—even if that were feasible and even if those fuels were sufficiently available. Thus, in *Kennecott Copper Corp.* v. *Federal Trade Commission*, 467 F. 2d 67, 79 (C.A. 10), petition for certiorari pending, No. 72-637, the court stated that, despite the competition of other fuels, coal prices "are now, and promise to be in the future, subject to the peculiarities of the coal business," and "other fuels appear to have a limited effect."

e. In sum, although coal is undoubtedly subject to some interfuel competition in some areas of the country and competes to a limited degree outside its distinctive market, it has a limited class of customers which is significantly narrower than that for all forms of "energy." Its special advantages are not competitively significant for some fuel customers; for other consumers its advantages give it a clear competitive edge. While other fuels may be attracting the business of some coal customers, thereby diminishing the narrow class, the confines of that class are clear. Thus, as the court held in *Kennecott Copper Corp., supra*, "[t]he coal industry is a distinct submarket which has characteristics which are not shared by the other fuel industries" (467 F. 2d at 79).[20]

[20] The appellees argue (Motion to Affirm, p. 17) that the court below "did not choose energy as the framework for its analysis in order to ignore the merger's competitive implications within the coal industry," but rather "because it assisted in explaining 'what has happened in the *coal* industry and to *its markets*.'"

The situation here is thus like that in *United States* v. *Aluminum Co. of America*, 377 U.S. 271, where this Court held that aluminum conductor is a relevant line of commerce for determining the effects of an acquisition combining a manufacturer of aluminum conductor and a manufacturer of copper and aluminum conductor. The competition between aluminum and copper conductor, upon which the district court had relied in refusing to treat aluminum conductor as a separate line of commerce, was, in the Court's view, "enough to justify grouping aluminum and copper conductors together in a single product market" (377 U.S. at 275). The Court concluded, however, "contrary to the District Court, that that degree of competitiveness does not preclude their division for purposes of § 7 into separate submarkets" (*ibid.*). Aluminum conductor, like coal, "has little consumer acceptance" for many uses but "enjoys decisive advantages" in a narrow application, where its substantially lower price is "the single, most important, practical factor in the business" (*id.* at 275–276). As with coal and other fuels, "aluminum and copper conductor prices do not respond to one another" (*id.* at 276).

The court's opinion, however, reflects no analysis of the structure of the coal submarket or of the impact upon it of the Freeman-United Electric combination. Indeed, the appellees have agreed that what they call the "subsidiary technicalities of market definition were not determinative of the decision below" (Motion to Affirm, p. 15). This Court, however, has repeatedly emphasized the importance of a proper market definition in determining the probable effects of a combination. *E.g.*, *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 322, n. 38, 343; *United States* v. *Continental Can Co.*, 378 U.S. 441, 458, 459–460, n. 10.

B. THE DISTRICT COURT'S CONCLUSION THAT ENERGY IS THE EXCLUSIVE RELEVANT LINE OF COMMERCE RESTED UPON A MISUNDERSTANDING OF UNITED STATES V. CONTINENTAL CAN CO., 378 U.S. 441.

The district court, after an extensive discussion of interfuel competition (J.S. App. 27a–53a), concluded that *United States* v. *Continental Can Co.*, 378 U.S. 441, "compel[s] this Court to conclude that since coal competes with gas, oil, uranium and other forms of energy, the relevant line of commerce must encompass interfuel competition" (J.S. App. 55a).[21] This conclusion rests upon a misunderstanding of *Continental Can*.

Continental Can involved the merger of a large producer of metal containers and a large producer of glass containers. The district court, although recognizing that there was substantial "interindustry competition" between the two products, held that the only appropriate lines of commerce were the can industry and the glass container industry separately and rejected various broader markets covering both products (378 U.S. at 447–448). This Court reversed,

[21] Despite the district court's express holding that "the energy market is *the* appropriate line of commerce for testing the competitive effect of the United Electric-Freeman combination" (J.S. App. 53a, emphasis added), it seemingly recognized, in its discussion of the relevant geographic markets, that coal is a separate product. Thus, the geographic markets, were defined on the basis of "the distributive patterns of * * * coal" (*id.* at 56a); the discussion focused on "those facilities for whose business coal mines are able to compete and those mines to which coal consumers can practicably turn for supplies" (*id.* at 57a). The sections of the country defined by the court were called "coal market[s]" (*id.* at 58a).

holding that "the interindustry competition between glass and metal containers is sufficient to warrant treating as a relevant product market the combined glass and metal container industries and all end uses for which they compete" (p. 457, emphasis added). Although "[g]lass and metal containers were recognized to be two separate lines of commerce," the Court ruled (pp. 456–457) that "given the area of effective competition between these lines, there is necessarily implied one or more other lines of commerce embracing both industries."

Continental Can was thus an application of the settled principle that there may be many relevant lines of commerce. It reflected the economic reality that where there is substantial competition between related products in different industries, the line of commerce to be used in examining a merger between companies in those industries must be drawn sufficiently broadly to "conform to competitive reality" (p. 457) and should not be limited "to competition between identical products" (p. 452). All that *Continental Can* suggests with respect to the energy market is that, in evaluating a merger between companies in different segments of that market—for example, the acquisition of a coal company by a natural gas producer—it would be appropriate to define a line of commerce to include both products.

There is nothing in *Continental Can,* however, which even suggests that, in evaluating a merger of two companies in the same industry, the market must be drawn to include other industries which compete with that industry. *Continental Can* dealt with the

question of how broadly a line of commerce may be drawn, not how narrowly, and the Court explicitly stated (p. 457) that the interindustry line of commerce it selected was "a" relevant product market. *Continental Can* cannot be read, as the district court in effect interpreted it, as indicating that, in evaluating a merger of two can companies or two glass companies, neither product alone would be a relevant line of commerce. To the contrary, the Court accepted the district court's conclusion that glass and metal containers were "two separate lines of commerce" (p. 456; see, also, p. 447), and ended its discussion of the relevant line of commerce with the statement from *Brown Shoe,* quoted above, that "within this broad market, well-defined submarkets may exist which, in themselves, constitute product markets for antitrust purposes" (p. 458, quoting from 370 U.S. at 325).

Continental Can, therefore, supports rather than refutes the government's contention that coal is a relevant line of commerce for testing the competitive impact of this merger of coal companies. See, also, *United States* v. *Aluminum Co. of America, supra.*

II

ILLINOIS AND THE EASTERN INTERIOR COAL PROVINCE SALES AREA ARE APPROPRIATE SECTIONS OF THE COUNTRY FOR DETERMINING THE COMPETITIVE EFFECTS OF THE ACQUISITION

The district court further erred in rejecting the two geographic markets the government proposed—the Eastern Interior Coal Province sales area and the State of Illinois, which is part of that sales area—and

instead adopting as the sole relevant sections of the country the ten markets the defendants proposed. The court's error in defining geographic markets was the reverse of its error in defining the product market. In choosing energy as the exclusive line of commerce, the court ignored relevant submarkets; in adopting the ten geographic markets, the court ignored relevant broader markets which constituted appropriate sections of the country.

A. THE GEOGRAPHIC MARKETS PROPOSED BY THE GOVERNMENT CORRESPOND TO THE REALITIES OF THE COAL INDUSTRY AND ARE ECONOMICALLY SIGNIFICANT

This Court in *Brown Shoe* identified the criteria for selecting appropriate sections of the country for Section 7 purposes (370 U.S. at 336–337): "[t]he geographic market selected must * * * both 'correspond to the commercial realities' of the industry and be economically significant." The Court emphasized that the combination is unlawful if "anticompetitive effects * * * are probable in 'any' significant market" (*id.* at 337). As the Court reiterated in *United States* v. *Pabst Brewing Co.*, 384 U.S. 546 549, the government is not required to delineate sections of the country "by metes and bounds" but need only show that the combination "may have a substantial anticompetitive effect somewhere in the United States—'in *any* section' of the United States."

The government here showed that the Freeman-United Electric combination may have a substantial anticompetitive effect in two sections of the country—the Eastern Interior Coal Province sales area and the

State of Illinois. Each corresponds to the competitive realities of the coal industry and is economically significant. Each is an appropriate geographic market.

1. The Eastern Interior Coal Province sales area is a relevant section of the country.

Transportation costs and the uneven distribution of coal deposits are the fundamental commercial realities affecting market structure in the coal industry (see J.S. App. 57a, Kurtz Dep. Ex. 10, A. Ex. 1657). These factors tend to insulate producers in one coal province from competition by producers in another coal province, and thereby to establish identifiable geographic markets. As the court below recognized (J.S. App. 57a), since transportation costs may be 30 to 40 percent of coal's delivered price, a consumer's geographical proximity to a mine and the resulting costs of transporting coal from the mine, are critical factors affecting the choice of a coal supplier. Because coal is found primarily in four producing regions (see p. 5, *supra*), a consumer's choice of a supplier is likely to be made from among producers within the nearest or most accessible region. The competitive sales areas for producers within a region thus conform generally to the geographic range beyond which transportation costs result in a delivered price that is higher than that for coal originating in another producing region.

The Eastern Interior Coal Province, within which all of Freeman's and United Electric's mines are located, is one of the country's four coal producing regions; it consists of the central and southern two-thirds of Illinois, southwestern Indiana, and western

Kentucky (Kurtz Dep. Ex. 10, A. Ex. 1657). The region is geologically united, and underlain by a coal-bearing sequence of rock known as the Pennsylvania System (A. 292–293, 679–681, 685). It is estimated that the region contains over 240 billion tons of bituminous coal resources, some 36 percent of the Nation's total resources (Kurtz Dep. Ex. 10, A. Ex. 1661).[22]

Because of the Province's geographic separation from the other producing regions (see Kurtz Dep. Ex. 10, A. Ex. 1657), its coal producers generally enjoy a competitive advantage over producers in other provinces with respect to sales to consumers in an identifiable sales area (A. 33–36). This sales area, within which most of the coal produced in the region and nearly all the coal produced by Freeman and United Electric is sold, comprises Illinois, Indiana, west Kentucky, west Tennessee, east Iowa, southeast Minnesota, south Wisconsin, and the extreme eastern portion of Missouri.[23]

---

[22] The coal industry and the public generally recognize the Eastern Interior Coal Province as a distinct geographic producing area (see A. 36–40, 74, 277, 330–331, 334–335, 694). The Mid-West Coal Producers Institute, Inc., a trade association for producers in the region, publishes monthly and annual production figures for mines within the Province (A. 327–329, 333–334).

[23] Bureau of Mines data reflecting the origin of coal shipments to each state show that an overwhelming proportion of the coal sold in Illinois and Indiana is produced in the Eastern Interior Province and that a substantial portion (40 to 90 percent) of the coal sold in the other states mentioned above originates in the Province (Gallagher Dep. Ex. 3, A. Ex. 1428–1429).

In 1967 about 82 percent of the coal produced in the Eastern Interior Coal Province was sold in the province sales area (GX 52, A. Ex. 67), and nearly 100 percent of the coal consumed by steam-electric utilities located within the sales area was produced in Province mines (GX 61, A. Ex. 79). In the same year Freeman sold 93.3 percent of its coal and United Electric sold 97.6 percent of its coal in the primary sales area (GX 52, A. Ex. 67).

The appellees' annual reports and advertisements acknowledge the ability of Freeman and United Electric to serve consumers throughout the midwest (see, *e.g.*, GX 5, p. 22, Kolbe Dep. Ex. 51, pp. 18–19, Nugent Dep. Exs. 14–16, Nugent Dep. Ex. 17, A. Ex. 1769, Nugent Dep. Ex. 19, A. Ex. 1771, and Nugent Dep. Ex. 20, A. Ex. 1773). Both United Electric and Freeman have at one time or another shipped coal to almost every State within the Province sales area (A. 218–230, 234–242, 250–255, GX 54–60, A. Ex. 68–78).

2. Illinois is a relevant section of the country.

Illinois has more coal resources than any other State (Kurtz Dep. Ex. 10, A. Ex. 1661, A. 681), and is the fourth largest producing State in terms of annual tons (Kurtz Dep. Ex. 10, A. Ex. 1660). The State was designated Mining District 10 under the Bitumi-

---

The location of other coal deposits in or near portions of some of the states suggests that Eastern Interior Province sales are not evenly distributed throughout the state but are concentrated in that portion which is closest to the Eastern Interior Province. Industry witnesses confirmed that Province sales were concentrated in the sections of the states indicated above (A. 275–277, 336–338, 601).

nous Coal Act of 1937, 50 Stat. 72, 78, 15 U.S.C. (1940 ed.) 833. Separate production and distribution data are reported for the State by the United States Bureau of Mines (Gallaher Dep. Ex. 3, A. Ex. 1428–1429, Kurtz Dep. Exs. 9–10, A. Ex. 1650–1661). All the Freeman and United Electric mines are in Illinois.

In 1967, 82 percent of the coal consumed in Illinois was produced within the State,[24] and 90 percent of the coal consumed by Illinois steam-electric utilities was produced in the State[25] (Gallagher Dep. Ex. 3, A. Ex. 1428). In the same year, about 58 percent of the coal produced in Illinois was sold in the State (Gallagher Dep. Ex. 3, A. Ex. 1424–1447). Freeman sold about 42 percent of its coal, and United Electric sold about 62 percent of its coal, to Illinois consumers.[26]

Thus, within the broader Province sales area Illinois is an economically significant submarket in which coal users buy most of their fuel from Illinois producers and in which producers, including Freeman and United Electric, sell more coal then they sell in any other state. The impact of the combination within the State is likely to be even more "direct and immediate" than in the broader Province sales area. See *United States* v. *Philadelphia National Bank*, 374 U.S. 321, 357. Because Illinois coal sales are dominated by Illinois producers, and because all the Freeman and United

[24] The figures for 1965 and 1966 were 77 percent and 81 percent, respectively (Gallagher Dep. Exs. 1, 2).

[25] The figures for 1965 and 1966 were 87 percent and 90 percent, respectively (*ibid.*).

[26] These facts were conceded by appellees in response to the government's proposed finding VI(A)(10).

Electric mines are in Illinois, structural data for the Province sales area as a whole will predictably understate the combination's effects within the Illinois submarket.

Although political boundaries do not always precisely parallel economic boundaries, both the government's and the appellees' expert witnesses testified that they are sometimes the best available approximation of a market (A. 1566, 1697). Cf. *United States* v. *Philadelphia National Bank*, 374 U.S. 321, where the relevant section of the country was a four-county area in which the consolidating banks had their offices; this Court, acknowledging the "artificiality" of the dividing line, stated that "such fuzziness would seem inherent in any attempt to delineate the relevant geographical market" (374 U.S. at 360, n. 37). States, of course, have frequently been held to be relevant geographic markets or submarkets. In *United States* v. *Pabst Brewing Co., supra*, for example, this Court determined that the relevant markets for assessing a merger of brewers were the Nation, the three-state area of Wisconsin-Illinois-Michigan, and the State of Wisconsin alone. There, as here, because the combination would have a significant effect within the state boundaries as well as in the broader markets, it was appropriate to consider those effects. See, also, *United States* v. *El Paso Natural Gas Corp.*, 376 U.S. 651, 657, where this Court stated that there could "be no doubt that California is a 'section of the country' as that phrase is used in § 7."

3. The district court erred in rejecting these areas as relevant sections of the country.

The reasons the court gave for rejecting the Province sales area and Illinois as "sections of the country" are unsound. The court stated that these two regions reflect "past and present production statistics" but "do not relate to actual coal consumption patterns" (J.S. App. 56a). We have already shown, however, that transportation costs and the availability of coal from other areas limit the market for Eastern Interior Province coal, that a very large portion of Province coal is consumed in its sales area, and that nearly all the coal sold in the sales area is produced in the Province (pp. 37–39, *supra*). Similarly, we have shown that a very large proportion of the coal used by Illinois consumers is produced in Illinois, and that most of the coal produced by Illinois mines is sold in the State (p. 40, *supra*).

The appellees argue (Motion to Affirm, pp. 19–21) that individual mines are so limited by transportation costs that they can sell only in a small portion of the Province sales area or the State. The record shows, however, that the competitive range of a mine is much broader than the appellees contend. A producer ordinarily encounters more competition as the distance which coal is shipped increases, because transportation costs ordinarily increase with distance (A. 28–29). But a producer can be a strong competitive factor as far as 500 miles from his mine.

In 1967, for example, Freeman's Orient mines in southern Illinois shipped 260,000 tons of coal 500 miles

to customers in Michigan (GX 55, A. Ex. 74, GX 56, A. Ex. 75), and 1.3 million tons to customers 300 to 500 miles from the mines (GX 55, A. Ex. 74, GX 56, A. Ex. 75, GX 57, A. Ex. 76). United Electric's Fidelity mine, located within 40 miles of the three Orient mines (Weir Dep. Ex. 1, A. Ex. 1845), shipped more than one million tons of coal to customers 300 to 500 miles away (GX 60, A. Ex. 79). These shipments represented more than half of the Fidelity mine's total production. Within the Eastern Interior Coal Province, most mines are situated within 500 miles of most locations in the Province sales area, and Freeman and United Electric both have mines that can supply any point in the sales region."

That no one producer sells coal, and no one consumer buys coal, "throughout" the sales area (J.S. App. 56a) does not imply that the area is too large to be a relevant section of the country. In *Tampa Electric Co.* v. *Nashville Coal Co.*, 365 U.S. 320, this Court held that a requirements contract between a Florida utility and a Tennessee coal producer did not violate Section 3 of the Clayton Act because the estimated total consumption of the utility would amount to only about one percent of the coal produced by mines within the competitive producing area. The Court determined that producers throughout the Appalachian region and portions of the Eastern Interior Coal Province could supply the Florida utility, and that all of these producing districts should therefore be considered part of the relevant market."

[27] Although Freeman did not sell any coal in Minnesota or Tennessee in 1967, a former Freeman president testified that Freeman could sell coal competitively in both states (A. 26–27).

[28] Because of Florida's location in relation to the Eastern and

Similarly, here, the important consideration is competitive ability. Since most mines within the Province can competitively supply most consumers in the sales area, it is an appropriate section of the country for Section 7 purposes, notwithstanding that no single mine in fact sells in every portion of the sales area at a given time.

B. THE GEOGRAPHIC MARKETS THE DISTRICT COURT ADOPTED ARE IMPROPER, BUT IN ANY EVENT THEY DO NOT NEGATE THE BROADER MARKETS OF ILLINOIS AND THE EASTERN INTERIOR COAL PROVINCE SALES AREA

The district court apparently adopted, as the exclusive sections of the country for purposes of Section 7, a patchwork of ten "geographic" markets proposed by the appellees.[28] The court's discussion (J.S. App. 56a–60a) indicates that it assumed it was required to choose between the smaller markets proposed by appellees or the broader ones proposed by the government. That assumption is erroneous.

As with product markets,[29] there may be more than one relevant section of the country, and narrow geographic markets do not negate the existence of one or more broader markets in which the combination

---

Eastern Interior Coal Provinces, producers in both regions are able to compete for the business of that State's coal consumers (see Gallagher Dep. Ex. 3, A. Ex. 1438).

[28] The court did not separately identify each of these ten markets, but its discussion indicates that it accepted the appellees' market delineations (J.S. App. 56a–59a).

[29] The standards for identifying relevant sections of the country "are essentially similar to those used to determine the relevant product market" (*Brown Shoe*, 370 U.S. at 336).

will have an effect. Since the statute speaks of "any" section of the country, it is improper to ignore the larger market merely because the smaller one seems also appropriate. In *Pabst Brewing Co., supra*, the Court evaluated the impact of the merger in the Nation as a whole and in a specific three-state area, even though the State of Wisconsin was by itself a relevant section of the country.

The markets that the district court adopted, however, are not appropriate sections of the country for determining the competitive effects of the Freeman-United Electric combination even if they are considered to be additional rather than exclusive markets. The court's markets are purportedly based on the areas served by producers in the four freight rate districts in which Freeman's and United Electric's mines were located at the time of trial.[21] The appellees argued that, since the normal rail rates for coal are the same for all mines in a particular freight rate district, and since transportation costs are the principal competitive factor in the marketing of coal, mines in one district could not effectively compete with mines in another district for the same customers.

The conclusion, however, does not follow from the premises. Although transportation costs are a primary competitive consideration, ordinary *rail* rates are not

[21] Illinois is divided into eight freight rate districts: Mineral-Atkinson, Northern Illinois, Fulton-Peoria, Springfield, Danville, Murdock, Belleville, and Southern Illinois (see Weir Dep. Ex. 1, A. Ex. 1845). The United Electric mines are located in the Fulton-Peoria and Belleville districts; the Freeman mines are located in the Springfield and Southern Illinois districts.

the single controlling element in transportation costs. The record shows that about half of the coal sold in the five states that received most of the Illinois coal in 1967 was transported by all-rail shipments (Gallagher Dep. Ex. 3, A. Ex. 1424–1427). To the extent that other modes of transportation are employed, the railroad rates do not necessarily determine the delivered price of the coal. That is particularly true for United Electric, which transports most of its coal by barge (A. 271–274).

Moreover, the most competitively significant rail shipments are not governed by the ordinary rail rates for each freight rate district. Many of the largest shipments are transported by "unit trains" carrying only coal between a particular mine and a customer's facility pursuant to a specially negotiated rate. Freeman, for example, has shipped coal by unit train from a mine in the Southern Illinois district to a customer in the Belleville district sales area at a cost which is lower than any Belleville district rate to that location (A. 30–31).

Moreover, the freight rate district sales areas adopted by the district court do not include major portions of the sales of producers located in a single freight rate district. All the facilities of Commonwealth Edison Company are treated as a separate single market although they range throughout a substantial geographic area and are served by producers in different freight rate districts. Customers located in the Chicago Air Quality Control Region also constitute a separate market. Moreover, all the customers within the sales

area of a particular freight rate district are not included in a single market. Such customers are divided into two categories, utility and non-utility firms, and each category is treated as a separate section of the country.[32] The result, as shown by the map facing page 48, is a crazy-quilt of artificial, noncontiguous sales areas, which do not reflect the way coal is marketed.

The map shows only six of the appellees' ten markets: the four freight rate district utility sales areas, the Chicago Air Quality Control Region, and the Commonwealth Edison Company.[33] One of these markets, represented in red, consists of three noncontiguous sections embracing parts of seven states. A second market, shown in blue, consists of two sections which are not contiguous to each other but are each contiguous to one of the three sections of the first market. A third market, shown in green, is a single section which is contiguous to one of the sections of the second

[32] Coal sold as dust also was excluded in defining sales areas. There is no basis for treating coal dust and coal screenings as separate products. See pp. 61–62, *infra*. The exclusion of dust necessarily distorted the sales area analysis. Producers in a single freight rate district (Southern Illinois) sold approximately one million tons of dust (constituting approximately 10 percent of their utility sales, DX 55, A. Ex. 475) to utilities in the sales area of another freight rate district.

[33] The map is based on the appellees' descriptions of the sales areas (A. 969, 972–977). Since those descriptions are somewhat imprecise, the map does not purport to be exact. It is an approximation of the six geographic markets. The four non-utility sales areas, which are not shown, are reasonably close to the utility areas, except that the Fulton-Peoria area (yellow) is larger and the Belleville area (blue) is limited to the lower section.

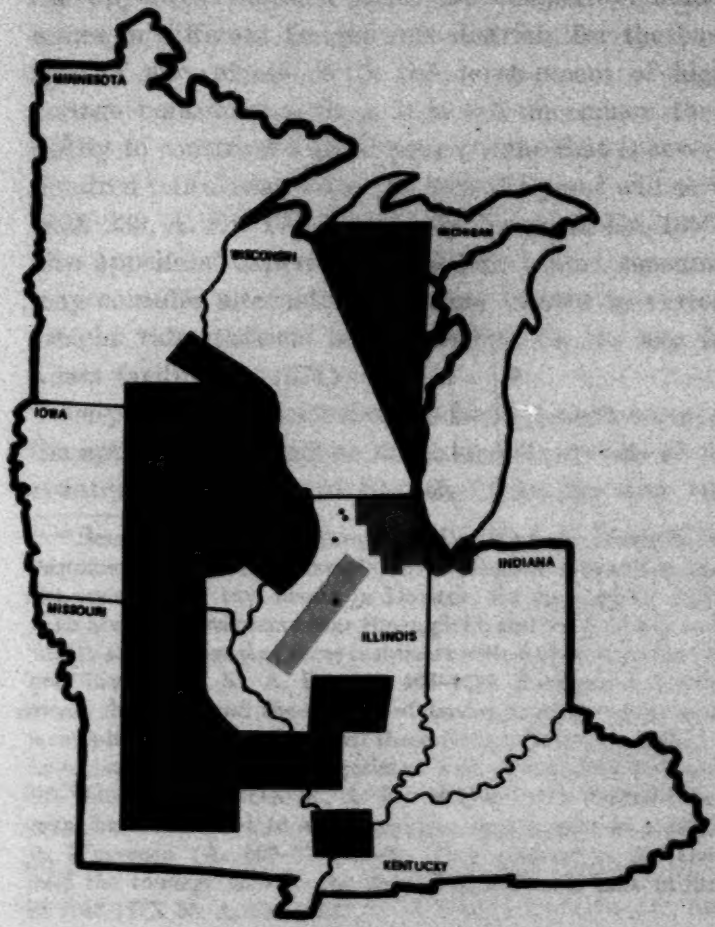
495-300—73——5

market. The Commonwealth Edison facilities, represented by black dots, are a separate market which is partially within three other markets. In sum, appellees' sales areas are "an obvious gerrymandering * * * to meet the exigencies of this case." *United States* v. *Bethlehem Steel Corp.*, 168 F. Supp. 576, 599 (S.D. N.Y.).

The artificiality of the appellees' markets is revealed by the fact that the eight sales areas for the four freight rate districts accounted for less than half of the total coal produced in those districts.[44] Nor did the eight markets accurately reflect the distribution of United Electric and Freeman coal. Some 25 percent of the coal produced in United Electric's Belleville district mine, for example, was sold to customers located in the Southern Illinois district sales areas (GX 60, A. Ex. 78), while nearly 20 percent of Freeman's Southern Illinois coal was sold in the Belleville sales areas (GX 55–57, A. Ex. 74–76). The two companies, though their mines were in different districts, sold about half of their production to common customers (GX 88–91, A. Ex. 107–117).

Moreover, because these markets were delineated on the basis of only one year's sales data, they necessarily reflected only the actual sales for that period and not the competitive ability of producers within the various districts who might, in another year, sell coal in a

[44] Only 46 percent of the coal produced in the Fulton-Peoria district was sold in appellees' utility and non-utility sales areas for that district; the figures for Springfield, Belleville, and Southern Illinois were 19, 47, and 70 percent, respectively (DX 55, A. Ex. 465, 468, 473, 478).



- Chicago Air Quality Control Region
- Fulton - Peoria Utility Sales Area
- Springfield Utility Sales Area
- Belleville Utility Sales Area
- Southern Illinois Utility Sales Area
- Com. Ed. Plant

GPO : 1973 O - 495-150

different geographic range (see A. 1670)." Similarly, the appellees' markets mask the competiton among mines in different freight rate districts for the business of new plants. With the development of high-voltage transmission lines, it is not uncommon for a utility to construct a plant near a mine that is several hundred miles away from the area the plant will serve (GX 239, A. Ex. 179, Kurtz Dep. Ex. 9, A. Ex. 1656). The appellees' expert conceded that a coal consumer may consider alternative suppliers located in various freight rate districts before settling on the site for a new facility (A. 1671).

Despite these deficiencies, the district court accepted the appellees' markets as the exclusive sections of the country for purposes of Section 7.[25] In our view "the

[25] Some of the markets were defined on the basis of only a few customers or sales. For example, the Springfield non-utility market consisted of two plants in Decatur, the Springfield utility sales area was two plants near Springfield, and the Fulton-Peoria utility area consisted of three customers with six plants on the Illinois River (DX 55, A. Ex. 462, 466–467). Subsequent developments demonstrated the danger of basing markets on so small a sampling of transactions. All three Fulton-Peoria area utilities have purchased from or negotiated with Springfield producers (A. 439–440, 1211, DX 55, A. Ex. 462, n. 1); a Fulton-Peoria mine has contracted to ship a million tons a year to a utility in Wisconsin (A. 609–610, 1640). That contract is for about half the tonnage sold to the three Fulton-Peoria area utilities in 1967 (DX 55, A. Ex. 462).

[26] Although the court stated that it would have reached the same conclusions even if it had accepted the government's geographic markets (J.S. App. 59a–60a), its discussion of competitive effects rested squarely on its view that "[t]he Freight Rate Districts in which the mines and reserves of United Electric are located serve separate and distinct markets from those in which the mines of Freeman are located" (J.S. App. 62a). The

pie [does not] slice so thinly." *Tampa Electric Co.* v. *Nashville Coal Co.*, 365 U.S. 320, 331. The district court ignored this Court's direction that "[t]he proper question to be asked * * * is not where the parties to the merger do business or even where they compete, but where, within the area of competitive overlap, the effect of the merger on competition will be direct and immediate." *United States* v. *Philadelphia National Bank*, 374 U.S. 321, 357. Instead of selecting sections of the country in which the competitive impact of the Freeman-United Electric combination would most likely be felt, the court below chose one of the "indefensible extremes" against which this Court cautioned in *Philadelphia National Bank*—it drew the market "so narrowly as to place appellees in different markets" (374 U.S. at 361).

III

THE EFFECT OF THE ACQUISITION MAY BE SUBSTANTIALLY TO LESSEN COMPETITION IN THE RELEVANT MARKETS

A. A HORIZONTAL MERGER IS ILLEGAL UNDER SECTION 7 IF IT SIGNIFICANTLY INCREASES CONCENTRATION IN A CONCENTRATED MARKET

Amended Section 7 of the Clayton Act prohibits a merger whose effect "may be substantially to lessen competition." Congress was concerned in 1950 with the rising trend toward concentration in the American economy, and it amended Section 7 in order to prevent mergers which produced anticompetitive changes in market structure, *i.e.*, those which threatened to weaken the normal play of competitive market forces. opinion contains no discussion of the effect of the combination on competition within the sections of the country proposed by the government (J.S. App. 60a–64a).

Brown Shoe, supra, 370 U.S. at 315–316, 320–322. Whether a horizontal merger has the proscribed effect under Section 7—and that Section deals with probabilities, not certainties—thus depends upon its effect on the structure of the relevant markets.

In *Brown Shoe* this Court stated that statistics "reflecting the shares of the market controlled by the industry leaders and the parties to the merger are, of course, the primary index of market power" (370 U.S. at 322, n. 38).[37] Where the merger produces a firm that controls an "undue" percentage share of the market and significantly increases concentration in the market, those facts alone establish *prima facie* that the effect of the merger may be substantially to lessen competition. *United States* v. *Philadelphia National Bank,* 374 U.S. 321, 363; *United States* v. *Continental Can Co.,* 378 U.S. 441, 458. The Court stated in *Philadelphia National Bank,* 374 U.S. at 363:

> This intense congressional concern with the trend toward concentration warrants dispensing, in certain cases, with elaborate proof of market structure, market behavior, or probable anticompetitive effects. Specifically, we think that a merger which produces a firm controlling an undue percentage share of the relevant market, and results in a significant increase in the concentration of firms in that market is so in-

[37] The Court also stated (370 U.S. at 343):

"The market share which companies may control by merging is one of the most important factors to be considered when determining the probable effects of the combination on effective competition in the relevant market."

See, also, *United States* v. *Continental Can Co., supra,* 378 U.S. at 458.

herently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects.

The Court noted also that in a market where "concentration is already great, the importance of preventing even slight increases in concentration and so preserving the possibility of eventual deconcentration is correspondingly great" (374 U.S. at 365, n. 42).

The Court in *Philadelphia National Bank* did not specify a minimum combined share which would establish *prima facie* illegality. It concluded, however, that the merging banks' combined share of more than 30 percent of the relevant market was sufficient to invoke the principle. In *United States* v. *Von's Grocery Co.*, 384 U.S. 270, and *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, the Court applied the principle to invalidate combinations involving considerably smaller combined shares where the markets had experienced a rapid increase in concentration. "[A] trend towards concentration in an industry, whatever its causes, is a highly relevant factor in deciding how substantial the anticompetitive effect of a merger may be" (*Pabst*, 384 U.S. at 552–553)."

In *Von's*, there had been a rapid decline in the number of single-store retail groceries in the market, an increase in the number of chains, and a history of acquisitions and mergers; the merger in question com-

"In *Von's* the Court stated that "where concentration is gaining momentum in a market, we must be alert to carry out Congress' intent to protect competition against ever-increasing concentration through mergers" (384 U.S. at 277).

bined the third and sixth largest chains with a combined share of 7.5 percent of the market. "These facts alone," the Court said, "are enough to cause us to conclude contrary to the District Court that the Von's-Shopping Bag merger did violate § 7" (384 U.S. at 274).

In *Pabst* the Court held that *prima facie* illegality had been established in three sections of the country. In the Nation as a whole, the acquisition combined the 10th and 18th largest brewers to form the fifth largest with about 4.5 percent of the market. In the Wisconsin-Illinois-Michigan area, the combination of the sixth and seventh largest brewers controlled about 11 percent of the market. In Wisconsin, the first and fourth largest combined to form the largest with 24 percent of the market (384 U.S. at 550–551). In each of these markets there had been a significant increase in concentration.[29]

In *United States* v. *Aluminum Co. of America*, 377 U.S. 271, the Court held unlawful a merger of the first and ninth largest producers of aluminum conductor, where the resulting combination controlled 29.1 percent of the aluminum conductor market and 16.3 percent of the narrower market of insulated alu-

[29] In the Nation, between 1957 and 1961, the number of sellers decreased from 206 to 162, and the top ten firms increased their share from 45 percent to 53 percent. In the three-state area, the number of breweries dropped from 104 to 86, and the share of the top eight companies grew from 59 percent to 68 percent. In Wisconsin, the number of firms went from 77 to 54, and the four leading companies boosted their share from 48 percent to 59 percent. (384 U.S. at 550–551.)

minum conductor.[40] In *United States* v. *Continental Can Co., supra*, the unlawful merger had resulted in a combined share of 25 percent of the metal and glass container market.[41]

B. UNDER THESE CRITERIA THE FREEMAN-UNITED ELECTRIC COMBINATION IS UNLAWFUL

1. The market is concentrated and the trend is toward further concentration.

As shown in the table on page 6, *infra*, in 1957 the top two coal producers in the Eastern Interior Coal Province had 29.6 percent of the production, the top four had 43.0 percent, and the top ten had 65.5 percent. Concentration in Illinois was even greater: the top two had 37.8 percent, the top four had 54.5 percent, and the top ten had 84.0 percent of the production. The pre-merger concentration levels in the relevant markets in this case, in *Von's*, and in *Pabst* are shown in the following table:

	Province	Illinois	Von's	Pabst, Wisconsin	Pabst, 3-State	Pabst, National
Top 2	29.6	37.8	----	----	----	----
Top 4	43.0	54.5	38.4	47.7	----	----
Top 8	----	----	60.9	----	58.9	----
Top 10	65.5	84.0	----	----	----	45.1
Top 12	----	----	65.6	----	----	----

[40] Both markets were concentrated. In the aluminum conductor market, the top two firms controlled 50 percent, the top five 76 percent, and the top nine 95.7 percent. In the insulated aluminum conductor market, the top five had 65.4 percent and the top nine had 88.2 percent. (377 U.S. at 278.)

[41] The top two firms in that market had 48.7 percent of the business, the top four had 62.7 percent, and the top six had 70.1 percent (378 U.S. at 461, n. 11).

Both geographic markets here thus were concentrated prior to the time Material Service assumed control of United Electric in 1959, and concentration rapidly increased between 1957 and 1967. In the Province sales area the share of the top two producers increased about 65 percent (29.6 percent to 48.6 percent), the top four's share rose about 46 percent (43.0 to 62.9), and the top ten's share increased about 40 percent (65.5 to 91.4). In Illinois the comparable figures were 43 percent (37.8 to 52.9), 38 percent (54.5 to 75.2), and 17 percent (84.0 to 98.0). These increases were, for example, significantly greater than those in *Von's,* where, over a ten-year period prior to the merger, the top four's share of the market had slightly decreased, the top eight's share had risen about 21 percent, and the top twelve's had increased about 26 percent.

In addition, between 1957 and 1967 the number of coal producers in Illinois decreased approximately 73 percent, from 144 to 39 (GX 73, A. Ex. 92). In *Von's,* by comparison, between 1950 and 1961 the number of single stores dropped only about 30 percent, from 5,365 to 3,818.

The district court apparently discounted the decline in the number of producers on the ground that the reduction "has occurred not because small producers have been acquired by others, but as the inevitable result of the change in the nature of demand for coal" (J.S. App. 60a). This Court has held, however, that the government is not required to show that a trend toward concentration is due to mergers. *Pabst, supra,*

384 U.S. at 552–553. "[A] trend toward concentration in an industry, whatever its causes, is a highly relevant factor in deciding how substantial the anticompetitive effect of a merger may be" (*ibid.*). Moreover, the record contains a four-page exhibit showing that at least 22 Eastern Interior Coal Province producers were acquired by other companies between 1955 and 1968; these acquisitions involved the transfer of control over 40 mines (GX 87, A. Ex. 101–106).

Appellees argue (Motion to Affirm, pp. 12–13, n. 11) that there is no pronounced trend toward concentration because, apart from Peabody Coal Company, the market shares of the other leading producers remained relatively stable over the ten-year period. But the effects of an increasingly concentrated market structure are not mitigated merely because the increases are caused chiefly by a single company. Nor is a merger's anticompetitive impact minimized because the combining companies' shares of the increasingly concentrated market have remained constant. See *Federal Trade Commission* v. *Procter & Gamble Co.*, 386 U.S. 568, 576–577.

The significant consideration is that increases in market concentration, whatever their cause, diminish the vigor of competition; it was this rising trend in concentration that Congress intended to halt in the 1950 amendments to Section 7 (pp. 50–51, *supra*). Appellees do not dispute that the trend in the Province and Illinois, without excluding Peabody or any other producer, is toward concentration.

2. The merger is prima facie unlawful because it produces a firm with an undue percentage share of these concentrated markets and significantly increases concentration there.

The acquisition of United Electric brought together two of the leading companies in each of these concentrated markets, and the market shares of the resulting Freeman-United Electric combination show that the acquisition "is of such a size as to be inherently suspect" (*Continental Can, supra,* 378 U.S. at 458). This is true whether the acquisition is viewed as of 1959, when Material Service obtained effective control over United Electric (J.S. App. 8a), or as of 1967, when United Electric became a wholly-owned subsidiary of General Dynamics (J.S. App. 9a).

The record contains detailed production data for mines in the Eastern Interior Coal Province and Illinois. Because of the correlation between production in Province mines and sales in the Province sales area, and between production in Illinois mines and sales to Illinois customers (see pp. 39–40, *supra*), the structural data based on production is a fair measure of the competitive impact of the acquisition within the two markets. Coal consumers in those areas will be directly affected by the alteration of the competitive structure of coal producers.

The following table shows, for 1959 and 1967, the ranking and share of coal production for Freeman,

United Electric, and the two combined, in both the Eastern Interior Coal Province and Illinois:

	Province		Illinois	
	Rank	Share (percent)	Rank	Share (percent)
1959 (GX 44, A. Ex. 60; GX 77, R. Ex. 90):—				
Freeman	2	7.6	2	15.1
United Electric	6	4.8	5	8.1
Combined	2	12.4	1	23.2
1967 (GX 73, A. Ex. 94; GX 95, A. Ex. 98):—				
Freeman	3	6.5	2	12.9
United Electric	9	4.4	6	8.9
Combined	2	10.9	2	21.8

The combined companies' shares of these markets are thus within the range of shares that this Court has held *prima facie* unlawful. The Illinois figures of 23.2 and 21.8 percent approach the 23.95 percent share in the *Pabst* Wisconsin market, the 25 percent share in *Continental Can*, and the 29.1 percent share in *Alcoa*. The Province figures of 12.4 and 10.9 percent approximate the shares held unlawful in the *Von's* (7.5), *Pabst* National (4.49), and *Pabst* three-state (11.32) markets.

The acquiring company, both in 1959 and 1967, substantially increased its market share. When it assumed control of United Electric in 1959, Material Service enlarged its percentage share of coal production in the Province from 7.6 to 12.4, an increase of about 63 percent; in Illinois its share grew from 15.1 to 23.2 percent, a jump of about 53 percent. Viewing the acquisition as a 1967 transaction, General Dynamics' share in the Province increased from 6.5 to 10.9 percent, a growth of 68 percent; in Illinois its share increased from 12.9 to 21.8 percent, a growth of

70 percent. These increases greatly exceed that in *Continental Can, supra,* where an increase of only 14 percent was held unlawful (378 U.S. at 461).

The acquisition also resulted in substantial increases in market concentration in each of the relevant areas. Since in each market for both 1959 and 1967 the Freeman-United Electric combination ranks first or second, it becomes relevant to examine the market shares of the top producers in those markets for those years but for the merger. In the following table, we compare such market shares to the shares of the top two producers given consummation of the merger, and show the resulting percentage increase in concentration.

	1959 (GX 64, A. Ex. 28, GX 77, A. Ex. 69)			1967 (GX 72, A. Ex. 91, GX 86, A. Ex. 94)		
	Share of top 2 but for merger	Share of top 2 given merger	Percent increase	Share of top 2 but for merger	Share of top 2 given merger	Percent increase
Province	33.1	37.9	14.5	45.0	48.6	8.0
Illinois	36.2	44.3	22.4	44.0	52.9	20.2

Thus, the immediate effect of the combination in either year, was to make an already concentrated market even more concentrated.

These structural data establish that the acquisition, whether viewed as of 1959 or 1967, "produce[d] a firm controlling an undue percentage share of the relevant market, and result[ed] in a significant increase in the concentration of firms in that market" (*Philadelphia National Bank, supra,* 374 U.S. at 363). It is therefore "inherently likely to lessen competition substantially" and "must be enjoined in the absence of evidence clearly showing that the merger is not likely

to have such anticompetitive effects" (*ibid.*). There is, as we show below (pp. 63–75), no such evidence in this case.

c. THE ACQUISITION IS ALSO ILLEGAL BECAUSE IT ELIMINATES SUBSTANTIAL COMPETITION BETWEEN FREEMAN AND UNITED ELECTRIC

1. As the table on page 11, *supra*, illustrates, Freeman and United Electric sell about half of their coal to common customers, and most of those sales are to identical customer facilities. Indeed, even in appellees' Commonwealth Edison market the two companies have been substantial competitors. In the years 1965 through 1967, United Electric shipped about 31 percent of its coal and Freeman shipped about 21 percent of its coal to identical facilities of the Commonwealth Edison Company (GX 70–72, A. Ex. 89–91, GX 88–90, A. Ex. 107–116).[42]

Salesmen of the two companies have actively solicited the same customers (A. 48, 121), and the companies have been asked to make bids to supply the same customer (see GX 104, A. Ex. 124–125). United Electric's president and a former president acknowledged that the company competed with Freeman (A. 84, 131). Customers of both companies have considered them competitors (GX 93, A. Ex. 118–119, GX 94, A. Ex. 121, A. 1437).

2. The district court, however, concluded that "an independent United Electric would not and could not compete with Freeman to any substantial degree" because the "companies have been and are now predominantly complementary in nature" (J.S. App.

[42] United Electric's contract with Commonwealth Edison expired in 1970 (J.S. App. 62a).

61a). The reasons the court gave for this conclusion are either beside the point or not supported by the record.

The court stated that United Electric is a strip mining company and Freeman a deep mining company (J.S. App. 61a). But the record is clear that coal from deep mines and strip mines is competitive (GX 91, A. Ex. 117). Freeman sells metallurgical coal and United Electric does not (J.S. App. 62a). But this amounts to only a small portion of Freeman's sales—about eight percent in 1969 (A. 1530)—and only a small portion of coal production and reserves in the relevant areas.[42]

Similarly, Freeman sells coal dust, a by-product of the production of metallurgical coal, while United Electric sells only "screenings" (*i.e.*, pieces of coal) (J.S. App. 62a). But dust and screenings are competitive products. Both are produced in coal mines, priced according to their BTU content, and shipped to the same customers by the same means for use in the same boilers (A. 1125–1127, 1396). Coal is crushed to dust size or smaller prior to burning (A. 1144–1145); and dust and screenings have an identical consistency as they proceed from the pulverizer to the boiler (A. 263–264). Since a ton of dust replaces a ton

[42] The metallurgical coke industry seeks coal with a maximum of 1.5 percent sulfur and a low ash content (GX 210, A. Ex. 135). In Illinois only about three percent of total coal reserves are estimated as within a range of one to three percent sulfur content, and only about half of those reserves are estimated to average 1.5 percent or less in sulfur content (GX 210, p. 22).

of screenings (assuming an equivalent BTU content), dust consumers would purchase more screenings if dust were not available (A. 1127, 1143–1144, 1164, 1396).

While Freeman's and United Electric's mines are in different freight rate districts (J.S. App. 62a), we have already shown that mines in different districts, including Freeman's and United Electric's mines, can and do compete for the business of the same customers (pp. 42–43, 45–50, 60–61, *supra*).

The court stated that, because of local and federal air pollution controls in the Chicago area, United Electric's Chicago market for its relatively high sulfur coal will ultimately disappear, and the company will no longer be able to compete with Freeman in that area (J.S. App. 62a). The record does not indicate, however, that these pollution controls will preclude the use of all high-sulfur coal. The director of the Chicago Air Pollution Control Agency testified that the applicable ordinance permits the burning of high-sulfur coal when used, for example, in conjunction with low sulfur fuels, or when adequate control devices are installed (A. 496–497). Such control devices are being developed and are expected to be available within four to five years. (A. 1185, 1429). Moreover, utility and industrial coal consumers are building new facilities outside the Chicago metropolitan area (A. 495–496); high voltage transmission lines now permit a utility to locate generating plants considerable distances from distribution centers (A. 1185).

D. THE MERGER CANNOT BE JUSTIFIED ON THE GROUND THAT, BECAUSE OF INADEQUATE RESERVES, UNITED ELECTRIC NO LONGER WAS A SIGNIFICANT COMPETITIVE FACTOR IN THE COAL BUSINESS

1. The claim that the merger would not substantially lessen competition because the acquired company had "inadequate resources" to remain a significant competitor must be tested by the general legal standards that govern the "failing company" defense.

In *Philadelphia National Bank, supra,* 374 U.S. at 363, the Court stated that a merger which gives the merged firm an "undue percentage share" of the market and significantly increases concentration "is so inherently likely to lessen competition substantially" that it must be enjoined "in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects." Similarly, in *Brown Shoe, supra,* 370 U.S. at 346, the Court recognized that in merger cases the defendant might present "mitigating factors, such as the business failure or the inadequate resources of one of the parties that may have prevented it from maintaining its competitive position." Appellees have made no contention that United Electric was a "failing company," *i.e.,* one whose "resources [were] so depleted and [for which] the prospect of rehabilitation [was] so remote that it faced the grave probability of a business failure" (*International Shoe Co.* v. *Federal Trade Commission,* 280 U.S. 291, 302). Indeed, they could not possibly make the argument on this record, which shows that the company has been a vigorous and successful competitor in the coal business, whose financial health

was good from at least 1955 to the time of trial (Statement, *supra*, pp. 8–9).

Appellees did contend—and the district court accepted the contention—that because United Electric's coal reserves were inadequate it "could not in the future be an independent, viable competitor of Freeman, or any other midwestern coal producer" (Defendants' Post-trial Br. 80; emphasis omitted); and that since United Electric standing alone could not continue as a competitive force in the market (Post-trial Br. 81–82), its elimination through merger could not substantially lessen competition. We submit, however, that this ruling reflects an erroneous concept of what constitutes the "inadequate resources" (*Brown Shoe*) that a defendant must establish, in order to overcome the government's *prima facie* case.

This Court has not elucidated the concept of "inadequate resources" which, it suggested in *Brown Shoe*, might justify an otherwise illegal merger.[44] It has, however, ruled that the analogous "failing company" defense has a "narrow scope" and can be successfully asserted only in extremely limited circumstances. *Citizen Publishing Co.* v. *United States*, 394 U.S. 131,

[44] Congress has expanded the "failing company" defense in dealing with the banking industry. In the Bank Merger Act of 1966 it provided that an anticompetitive merger nevertheless may be approved if it is found that "the anticompetitive effects of the proposed transaction are clearly outweighed in the public interest by the probable effect of the transaction in meeting the convenience and needs of the community to be served." 12 U.S.C. 1828(c)(5)(B). In creating this new defense Congress recognized that even though a bank might not be "so deeply in trouble as to

139. We submit that any defense based on the alleged inadequate resources of the acquired firm is similarly available only on narrowly circumscribed conditions.

a. The defense of inadequate resources rests on the same economic premise as the failing company defense: that if a firm has ceased to be an economically viable enterprise, its elimination cannot substantially lessen competition because it no longer is a significant competitive factor in the market. In manufacturing and distributing industries, it is difficult to envision a case where the inadequate resources defense could be made. In an extractive industry, however, there may be exceptional situations in which the condition of a firm's resources are such that, apart from the merger, it was about to disappear from the market.

Assume, for example, that a firm which currently produces 25 percent of a particular metal acquires a firm which produces 20 percent of that metal and that the industry is highly concentrated. Under this Court's market structure standards for deciding Section 7 cases, the merger would be *prima facie* illegal (*supra*, pp. 50–60). Further assume, however, that the

---

call forth the traditional 'failing company' defense," if it was "nonetheless in danger of becoming before long [a] financially unsound" institution, the public interest in avoiding the latter condition might outweigh the anticompetitive effects of the merger. *United States* v. *Third National Bank in Nashville*, 390 U.S. 171, 187. Congress, however, has not created any similar exception to the "failing company" defense for the coal industry and certainly has not manifested any intention that the "inadequate resources" theory in *Brown Shoe* should be given a comparable expansion.

acquired firm, although having 20 percent of the market, (1) would exhaust its supply of the metal within a year, (2) could not obtain any substitute source of supply, and (3) had neither the financial resources nor the managerial skills that would enable it to prolong its independent existence through resort to new technology or further exploration. In such circumstances, the merger apparently would not substantially lessen competition because the acquired firm would soon cease operations.

Since Section 7 is concerned with the probable effects of a merger on competition, the failing company defense has focused mainly on the most convincing evidence of inability to continue operations—the imminent likelihood of financial collapse. An "inadequate resources" claim, however, requires a broader and more sophisticated analysis. Where the company is economically sound and not facing immediate financial catastrophe, there are substantial uncertainties with respect to its probable future even if its present supply of raw materials is about to be exhausted. The acquisition of a financially healthy firm in an extractive industry, such as United Electric, means that the firm is unlikely to conduct research and development designed to obtain more efficient use of existing resources or to discover new ones; use of new industrial techniques may permit the extraction of raw materials previously considered unusable and lead to the discovery of new sources of supply. See *infra*, pp. 71–74, and n. 53. Moreover, the longer the time before the re-

sources will be exhausted, the less certain it is that the acquired firm would disappear without the merger.

Thus, although an "inadequate resources" defense invokes the same economic principle as a failing company defense, the inherent uncertainty that a lack of inadequate resources will result in the termination of operations requires an even stronger showing of imminent collapse than is required in the case of an allegedly failing company. Recognizing the differences in the factual showing required to support that claim, we submit that an "inadequate resources" defense must be tested by the general legal standards which this Court has established in "failing company" cases.[45]

b. This Court has made it clear that before a financially ailing firm can be considered "failing" the condition of the firm must be such that there is no realistic prospect of recovery so that were it not for this particular acquisition, the firm would quickly have disappeared from the market. The critical consideration is that there is no reasonable alternative possibility of rehabilitating the firm or keeping it going. Section 7 is concerned with long-range trends and changes in market structure, and the acquisition of an alleged "failing company" would pose no reason-

[45] "The burden of proving that the conditions of the failing company doctrine have been satisfied is on those who seek refuge under it" (*Citizen Publishing Co.* v. *United States*, 394 U.S. 131, 138–139, footnote omitted). In view of the closely-related character of that defense to the inadequate resources defense, we submit that the burden of establishing the latter similarly is on "those who seek refuge under it."

able probability of anticompetitive effect only if that company were otherwise permanently and irrevocably incapacitated. For this reason, temporary difficulties, no matter how serious or substantial, are not sufficient to constitute a failing company defense. Before that defense can be accepted, every reasonable method of economic rehabilitation must have been adequately explored and found unavailable.

Thus, for a company to be "failing" so that its elimination cannot substantially lessen competition, its situation must be so precarious and so hopeless that it is "on the brink of collapse" and its prospects of reorganization or resuscitation must be "dim or nonexistent" (*Citizen Publishing Co.* v. *United States*, 394 U.S. 131, 138). The Court there also pointed out (*ibid.*):

> The failing company doctrine plainly cannot be applied in a merger or in any other case unless it is established that the company that acquires the failing company or brings it under dominion is the only available purchaser. For if another person or group could be interested, a unit in the competitive system would be preserved and not lost to monopoly power.

In *United States* v. *Greater Buffalo Press, Inc.*, 402 U.S. 549, 555–556, the Court recently reiterated that the failing company defense requires a showing that the acquired company was in danger of imminent financial collapse and that the acquiring company was the only prospective purchaser. See, also, *United States* v. *Third National Bank in Nashville*, 390 U.S. 171, 189.

This Court's decisions also indicate that the validity of a failing company defense must be determined as of the time of the acquisition, not as of the time of trial. In *International Shoe*, the acquisition had taken place in May 1921, and the Court focused upon the acquired company's financial condition between 1920 and "the spring of 1921" (280 U.S. at 300). In *Citizen Publishing*, the transaction with respect to which the failing company defense was asserted took place in 1940, and the Court considered the acquired firm's condition as of that date, although the suit was not brought until 1965 (see 394 U.S. at 138). Similarly, in *Greater Buffalo*, the critical time for evaluating the defense was "the year of the sale," not the time of trial (402 U.S. at 555).[*] The reason is that, since the rationale of the failing company defense is that a merger cannot have anticompetitive consequences if the company thereby eliminated was about to disappear anyhow as a significant factor in the market, the company's viability must be determined as of the time of the merger.

For the same reasons, we submit that an "inadequate resources" defense is not available unless, at the

---

[*] In *Federal Trade Commission* v. *Consolidated Foods Corp.*, 380 U.S. 592, 598, the Court stated:

"[T]he force of § 7 is still in probabilities, not in what later transpired. That must necessarily be the case, for once the two companies are united no one knows what the fate of the acquired company and its competitors would have been but for the merger."

See, also, *United States* v. *Continental Can Co.*, *supra*, 378 U.S. at 463; *United States* v. *Penn-Olin Chemical Co.*, 378 U.S. 158, 170, 177; *Federal Trade Commission* v. *Procter & Gamble Co.*, 386 U.S. 568, 577.

time of the acquisition, (1) the acquired company was about to cease operation because it had no reasonable likelihood of obtaining additional raw materials or otherwise solving its supply problem, and (2) there was no alternative way of preserving its existence, such as sale to a purchaser—other than one of its largest competitors—who would undertake to rehabilitate it. Neither condition was satisfied in this case, and accordingly the "inadequate resources" defense should have been rejected."

2. The district court did not find, and the record does not show, that at the time of the acquisition United Electric was about to go out of business and could not be rehabilitated.

a. The district court held that United Electric cannot "continue operations beyond the life of its present mines" and "standing alone, cannot contribute meaningfully to competition" (J.S. App. 63a, 64a). It stated that the government "failed to come forward with any evidence that such reserves are *presently* available" (*id.*, 63a, emphasis in original), and that "virtually all of the economically mineable strip reserves of United Electric have been sold under long-term contracts, and United Electric has neither the

" Although we did not frame our argument in these terms in our jurisdictional statement, we argued there, as we do here, that the district court erred in considering only "whether the acquired firm could survive *at the time of trial* as a competitive entity, without also (and more significantly) determining the competitive potential cut off by the acquisition" (J.S. 22, emphasis in original). See, also, J.S. 20, 24. Similarly, we stated in our Brief in Opposition to Motion to Affirm (p. 5) that "appellees' claim that UEC is a self-liquidating company is essentially an affirmative defense, akin to the failing company defense * * *."

possibility of acquiring more nor the ability to develop deep coal reserves" (*id.*, 65a).

These findings do not sustain an "inadequate resources" defense because they do not relate to United Electric's reserves and viability in 1959, when Material Service took effective control of the company, or in 1967, when General Dynamics became the company's sole shareholder (J.S. App. 8a–9a). There is no finding, and the record does not show, that in 1959 or 1967 United Electric was about to go out of business as a consequence of depleted reserves. Nor is there any finding that virtually all of United Electric's strip reserves were committed in either of those years; the finding that 48 of 52 million tons of those reserves were committed (J.S. App. 9a, 65a) related to the time of trial (see note 7, *supra*). Similarly, although the court found that, at the time of trial, United Electric could not reasonably expect to acquire additional economically mineable strip reserves, it did not find that it could not have acquired such reserves in 1959 or 1967. Indeed, the record shows that between 1959 and 1970 United Electric did enhance its reserves at existing mines.[48] Moreover, other coal producers acquired new strip reserves in Illinois and Indiana after 1960 and were actively prospecting for coal reserves even at the time of trial (A. 1489–1490).[49]

---

[48] Although it mined 50 million tons of coal from 1959 to 1969, the estimated reserves dedicated to existing mines declined only about 18 million tons (DX 60, A. Ex. 517, 540, 544–561).

[49] Commonwealth Edison was itself acquiring central Illinois strip reserves which it expected to use (A. 1422, 1430, 1442).

The district court also found that United Electric has no experience in developing deep coal reserves and no "likelihood of acquiring it" (J.S. App. 61a). But it did not consider whether, had Freeman (a deep coal producer) not acquired the company, United Electric could have acquired the necessary expertise, either by training its own personnel, hiring already experienced personnel, entering into a joint venture of limited duration with a deep coal company, or even acquiring a small deep coal producer.

Appellees have never disputed that ample deep coal reserves are available in the Eastern Interior Coal Province. Humble Oil was able to acquire 3 billion tons of deep reserves in 1965 and 1966 (DX 61, A. Ex. 577, A. 849). The record shows that United Electric has had both the financial resources and general coal marketing experience necessary to enter deep mining,[50] that at least one company (Humble Oil) made a *de novo* entry into deep mining after 1964,[51] and that one strip mining company (Ayrshire Collieries) acquired an existing small deep mining company in the 1950s and used the acquired firm's staff as

[50] The company's financial health has for many years been excellent (p. 9, *supra*). In 1968, it had $10.7 million in working capital, a net worth of $26.9 million, and no long term debt (GX 34, A. Ex. 40). A past president of United Electric and of Freeman estimated that the cost of opening a deep mine at Round Prairie Field, where United Electric has acquired deep reserves, would be $6.5 million to $7.5 million (A. 94).

The market for United Electric's strip-mined coal would be available for deep-mined coal (A. 1493, 1693).

[51] Humble constructed a deep mine at a cost of between $10 million and $20 million (excluding the cost of reserves); the mine is expected to produce three million tons of coal per year for 20 to 30 years (A. 849).

the nucleus of a new deep mining organization (A. 1490–1491).[52]

It is a well-known fact in the American economy, of which this Court may take judicial notice, that firms in the extractive industries regularly and constantly seek and obtain new sources of supply. Oil companies and natural gas companies are searching for new oil and gas reserves; the record shows that coal companies, too, vigorously pursue this policy of exploration and acquisition of additional reserves (A. 1498). Moreover, research into new methods of extraction often succeeds in rendering usable reserves which previously could not have been economically mined.[53] It is hard to believe that a firm as large, important, and financially strong as United Electric, which both in 1959 and in 1967 was one of the major coal companies in the midwest, would idly sit by and allow its entire coal business to disappear because its existing coal reserves were becoming exhausted. To the contrary, the realities of economic life indicate that, had United Electric remained an independent company, it, like other companies similarly situated, would have vigorously

[52] Although the Ayrshire venture was not successful, an official of that company testified that the problems were unrelated to extractive expertise: "I rather doubt that anyone could have made a profitable operation out of it" (A. 1491).

[53] As a result of the technological changes in methods of extraction, the depths at which strip mining may occur and the proportion of ground cover to coal seam thickness (overburden ratio) which can be economically removed have changed so that mining of previously unusable coal deposits has become feasible (A. 57, 400, 532, 645–646, 689–690, 1489, 1495, 1532, DX 49, A. Ex. 403, GX 632, A. Ex. 158).

pursued a policy of obtaining additional reserves to enable it to continue its substantial business as its existing reserves were depleted.

b. Similarly, the district court did not find, and the record does not show, that, at the time of acquisition, there was no possibility of solving United Electric's problems of a lack of adequate coal reserves other than by eliminating the company. Cf. *Citizen Publishing Company, supra.* Indeed, the record does not indicate that United Electric sought or agreed to the merger because of concern that it was about to go out of business because of a lack of reserves. In light of the experience of other companies in entering into deep mining of coal without prior experience and the substantial deep mining reserves available in the area where United Electric operates (see *supra,* pp. 71–73), this merger could not be justified by reference to United Electric's "inadequate resources" unless and until that company had explored all possibilities but found them unavailable.

CONCLUSION

The judgment of the district court should be reversed, and the case remanded for the entry of an appropriate decree.

Respectfully submitted.

ERWIN N. GRISWOLD,*
Solicitor General.
THOMAS E. KAUPER,
Assistant Attorney General.
DANIEL M. FRIEDMAN,
Deputy Solicitor General.
MARK L. EVANS,
Assistant to the Solicitor General.
CARL D. LAWSON,
JOHN B. WYSS,
Attorneys.

FEBRUARY 1973.

---

*This brief was completed and its final form determined in February 1973, when Mr. Griswold was Solicitor General. Its filing has been delayed until October 1973 because, pursuant to Rule 36(4) of the Rules of this Court, the parties deferred the printing of the appendix until both sides' briefs were completed. The record references to the appendix could not be inserted in the brief until the appendix was printed.

U.S. GOVERNMENT PRINTING OFFICE: 1973

No. 72-402

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1973

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION, APPELLEES

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

BRIEF FOR APPELLEES

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
2900 Prudential Plaza
Chicago, Illinois 60611

ALBERT E. JENNER, JR.
One IBM Plaza
Chicago, Illinois 60611

Attorneys for Appellees

KIRKLAND & ELLIS
Chicago, Illinois

JENNER & BLOCK
Chicago, Illinois

Of Counsel

La Salle Street Press—Chicago

INDEX

	PAGE
Question presented	1
Statement	2
Summary of argument	5
Argument:	
I. Substantial evidence supported the District Court's determination that the Freeman-United Electric combination has not led and is not likely to lead to a substantial lessening of competition	12
A. United Electric is not a competitive factor	12
1. Reserves are the key factor in measuring a coal producer's market strength	13
2. United Electric does not have the coal reserves to be considered a competitive force	17
3. United Electric has neither the possibility of acquiring more strip reserves nor the ability to develop deep-coal reserves	20
4. Other industry forces at work make it inconceivable the combination could have an adverse effect on competition	29
B. The combination of Freeman-United Electric did not eliminate actual or potential competition between them	36
C. Evidence from numerous knowledgeable industry representatives confirmed that the Freeman-United Electric combination has not led and is not likely to lead to a substantial lessening of competition	42
D. There remains no other justification for the Government's complaint	46
II. The District Court committed no error in declining to decide the case solely upon the structural data submitted by the Government	48
A. The decision below did not turn on the subsidiary questions of market definition	49

ARGUMENT—CONTINUED

PAGE

B. The District Court correctly rejected the market definitions urged by the Government 53

C. The Government's structural data was not a fair measure of the competitive impact of the combination 64

III. The fourth question presented by the Government is untimely, inconsistent and without merit 69

Conclusion 77

CASES

Ayrshire Collieries Corp. v. *United States*, 335 U.S. 573 (1949) 4, 60

Brown Shoe Co. v. *United States*, 370 U.S. 294 (1962) 6, 11, 49, 52, 54, 55-56, 57

Case-Swayne Co. v. *Sunkist Growers, Inc.* 369 F.2d 449 (9th Cir. 1966), *rev'd*, 389 U.S. 384 (1967) 57

Citizen Publishing Co. v. *United States*, 394 U.S. 131 (1969) 47

Federal Power Commission v. *Hope Natural Gas Co.*, 320 U.S. 591 (1944) 54

Fuels Research Council, Inc. v. *Federal Power Commission*, 374 F.2d 842 (7th Cir. 1967) 54

Kennecott Copper Corp. v. *Federal Trade Commission*, 467 F.2d 67 (10th Cir. 1972) 22, 51

Mississippi River Transmission Corp. and United Gas Pipe Line Co., 41 FPC 555 (1969) 54

National Coal Association v. *Federal Power Commission*, 247 F.2d 86 (D.C. Cir. 1957) 54

Natural Gas Pipeline Co. of America, 28 FPC 731 (1962) 54

CASES—CONTINUED

PAGE

Natural Gas Pipeline Co. of America v. *New York Central RR. Co.*, 323 ICC 75 (1964) 54

Tampa Electric Co. v. *Nashville Coal Co.*, 365 U.S. 320 (1961) 15, 53-54

Tampa Electric Co. v. *Nashville Coal Co.*, 276 F.2d 766 (6th Cir. 1960), *rev'd*, 365 U.S. 320 (1961) 15, 54, 61

United States v. *Aluminum Co. of America*, 377 U.S. 271 (1964) 56

United States v. *Columbia Pictures Corp.*, 189 F.Supp. 153 (S.D.N.Y. 1960) 56

United States v. *Connecticut Nat'l Bank*, 5 Trade Reg. Rep. (1973 Trade Cas.) ¶ 74,577 (D. Conn. 1973) 51, 56, 57

United States v. *Continental Can Co.*, 378 U.S. 441 (1964) 55, 56, 64

United States v. *Crocker-Anglo Nat'l Bank*, 277 F. Supp. 133 (N.D. Calif. 1967) 40, 51-52, 57, 59, 64

United States v. *du Pont & Co.*, 351 U.S. 377 (1956) 11, 12, 56, 64

United States v. *du Pont & Co.*, 353 U.S. 586 (1957) .. 46

United States v. *First Nat'l Bank of Md.*, 310 F.Supp. 157 (D. Md. 1970) 51

United States v. *Inter-Island Steam Nav. Co.*, 87 F.Supp. 1010 (D. Haw. 1950) 46

United States v. *Kimberly-Clark Corp.*, 264 F.Supp. 439 (N.D. Cal. 1967) 57

United States v. *Kryptok Co.*, 11 F.2d 874 (S.D.N.Y. 1925) 46

United States v. *Northwest Industries, Inc.*, 301 F.Supp. 1066 (N.D. Ill. 1969) 57

CASES—CONTINUED

PAGE

United States v. *Pabst Brewing Co.*, 233 F.Supp. 475 (E.D. Wis. 1964) 43

United States v. *Pabst Brewing Co.*, 384 U.S. 546 (1966) 9, 11, 49-50, 64, 66

United States v. *Peabody Coal Co.*, 1967 Trade Cas. 84,376 (N.D.Ill. 1967) 16, 68

United States v. *Philadelphia National Bank*, 374 U.S. 321 (1963) 43, 65, 66

United States v. *Standard Oil Co.* (New Jersey), 253 F.Supp. 196 (D.N.J. 1966) 27

United States v. *Tidewater Marine Service, Inc.*, 284 F.Supp. 324 (E.D. La. 1968) 42, 57

United States v. *U.S. Steel Corp.*, 251 U.S. 417 (1920) . 46

United States v. *Von's Grocery Co.*, 384 U.S. 270 (1966) 7, 9, 66

United States v. *Yellow Cab Co.*, 338 U.S. 338 (1949) . 64, 77

STATUTES AND RULES

Clayton Act, Section 7, 38 Stat. 731, as amended, 64 Stat. 1125, 15 U.S.C. 18 .....*passim*

Fed. R. Civ. P. 52(a) 12, 64

Sup.Ct.R. 40(1)(d)(2) 2, 70

MISCELLANEOUS

FEDERAL TRADE COMMISSION STAFF REPORT, INTERFUEL SUBSTITUTABILITY IN THE ELECTRIC UTILITY SECTOR OF THE U.S. ECONOMY 115 (1972) 53

1970 ANNUAL COAL, OIL & GAS REPORT, ILLINOIS DEPT. OF MINES AND MINERALS 25

1971 ANNUAL COAL, OIL & GAS REPORT, ILLINOIS DEPT. OF MINES AND MINERALS 17, 25

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1972

No. 72-402

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, and FREEMAN COAL MINING CORPORATION, APPELLEES

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

BRIEF FOR APPELLEES

QUESTION PRESENTED

There is really only one question presented by this case:

Whether the District Court's conclusion, "upon the basis of reliable, probative and substantial evidence contained in the record," that the longstanding affiliation of two coal producers challenged in this action does not violate Section 7 of the Clayton Act is clearly erroneous. (J.S.App. 66a.)

The subsidiary questions of market definition which the Government urges as presenting additional questions for

review, while correctly decided by the District Court, were neither critical to, nor controlling of, the decision below. The District Court specifically held in this regard that no violation of Section 7 would be found "even were this court to accept the Government's unrealistic product and geographic market definitions." (J.S.App. 66a.)

The other question which the Government now states is presented was not raised in its Jurisdictional Statement. There the Government urged that this Court conduct a plenary review of the trial record to determine whether there was evidentiary support for the trial court's findings with respect to the inability of the acquired company to secure the strip coal reserves or expertise in the mining of deep coal reserves necessary for it to be a viable competitive force.[1] Having now taken a hard look at the record and seen that it is dead against them, Government counsel handling the appeal state that they have "shifted." They now wish to present for review—instead of the original question—the question whether the District Court tested United Electric's competitive demise at the proper time and under correct standards. Far from presenting a serious question, however, the Government's arguments on this score are nothing more than a contrived afterthought, lacking in substance and totally at odds with their position in the District Court. They should be rejected out of hand, if not disregarded completely. See Supreme Court Rule 40(1)(d)(2).

STATEMENT[2]

The combination of Freeman Coal Mining Corporation and The United Electric Coal Companies which the Gov-

[1] See Jurisdictional Statement, Question 4 and pages 21-24. See also Brief for the United States in Opposition to Motion to Affirm, pp. 3-8.

[2] Record references to the facts summarized here appear in the Argument portion of this brief where they are discussed in (cont.)

ernment seeks to undo is nearing the close of its second decade, and United Electric itself is at the end of its competitive life. This longstanding affiliation had its inception in 1954 when the Freeman interests purchased more than 10 percent of United Electric's stock, and was formalized in 1959 when five new directors were elected to United Electric's nine-man Board, a new president was chosen as chief executive officer, and the president of Freeman became Chairman of United Electric's Executive Committee as well. The affiliation was disclosed to both the public and the Government from the outset, and in 1960 the Antitrust Division of the Department of Justice was furnished information with respect to the common stock ownership of Freeman and United Electric, but took no action. (J.S. App. 7a-8a.)

By the mid-1950's United Electric found itself faced with a critical reserve problem. While uncommitted coal reserves are, of course, the life blood of any coal producer, the company's premerger management had unfortunately not provided for its future. United Electric recognized the need to stem its deteriorating competitive position and that a merger with another coal producer was the only realistic way to achieve this. Accordingly, prior to its affiliation with Freeman, the company attempted, without success, to merge with or acquire a number of other coal companies.

---

detail. The record in this case, as the trial court noted, "consists of more than 7,500 pages of trial transcript and deposition testimony, and more than 800 trial and deposition exhibits, containing in excess of 10,000 pages." (J.S.App. 2a, n.2.)

In the Proposed Findings of Fact and Conclusions of Law submitted by them following the trial, the defendants attempted to summarize and set forth in a concise and organized manner those portions of the trial record material to the issues raised in the complaint—and subject to review by this Court. Accordingly, for the Court's convenience, these Proposed Findings (hereafter "DPF") have been reprinted in full in the Joint Appendix, as have most of those portions of the record cited therein.

After its affiliation with Freeman, United Electric's land policies were changed, and an aggressive reserve acquisition program pursued. By that time, however, the strip reserves necessary for United Electric to remain a viable competitive force in the Midwest were controlled by other producers. There was also no prospect for United Electric remaining viable through entry into deep mining. Since at least 1930, and continuing to date, United Electric has had neither the equipment, personnel nor expertise required for successful entry into deep mining; it was strictly a strip mining company and was destined to remain so. In sum, whether viewed from the standpoint of 1959, or the date of the filing of the complaint, or the time of trial, United Electric was not going to survive as a significant competitive force.

The affiliation of Freeman and United Electric brought together "predominantly complementary rather than competitive producers." (J.S.App. 65a; see also J.S.App. 61a.) United Electric is a strip mining company producing low quality, high sulphur coal, while Freeman is a deep mining company producing high quality, low sulphur coal. The operations of United Electric are located in different ICC-designated Freight Rate Districts[2a] from those of Freeman, and as the Court pointed out, "responses to the subpoena questionnaire sent to midwest coal consumers demonstrated that each Freight Rate District serves a distinct and definable area, as did the testimony of producers and consumers." (J.S.App. 57a.)

Not until September 22, 1967 did the Government file its complaint alleging that the Freeman-United Electric affilia-

---

[2a] The Interstate Commerce Commission has designated various coal producing areas within Illinois, Indiana and west Kentucky as "Freight Rate Districts." See DPF 286-287, A.964. The history and functions of the Freight Rate Districts involved in this litigation are discussed in *Ayrshire Collieries Corp.* v. *United States*, 335 U.S. 573, 576 (1949).

tion violated Section 7 of the Clayton Act and praying that General Dynamics be required to divest itself of its interests in United Electric. On the basis of two and a half years of pretrial discovery, a month long trial, and the submission by both sides of pretrial proposed findings and extensive post trial proposed findings, briefs and replies, a distinguished antitrust trial judge[2] reached the conclusion, after an "evaluation of the massive quantity of evidence submitted by the parties," that the challenged combination "has not led, and is not likely to lead to a substantial lessening of competition." (J.S.App. 2a, 65a.)

SUMMARY OF ARGUMENT

The District Court's determination that the challenged combination does not violate Section 7 turned on a host of disputed and complex *factual* issues, each of which was resolved squarely against the Government on the basis of abundant evidence. It was this record evidence that compelled the court below to recognize that:

First, since virtually all of United Electric's economically mineable strip reserves have been sold under long-term contracts, and it has neither the possibility of acquiring more nor the ability to develop deep coal reserves, the Company is not a significant competitive force. (J.S.App. 65a-66a.) In fact, it was United Electric's critical reserve position which led it in the 1950's to seek affiliation with another coal producer. (J.S.App. 8a, n.7.)

Second, because of differences in the location and types of their mines, in the quality of their coals and in the nature

[2] Chief Judge Robson, who heard all of the evidence and spent nearly two years fashioning his decision, was the coordinating judge in the civil electric antitrust cases, an original member and the first chairman of the Judicial Coordinating Committee for Multiple Litigation and one of the principal architects of the Manual for Complex and Multidistrict Litigation.

of their transportation routes, Freeman and United Electric have long been predominantly complementary rather than competitive producers, and an independent United Electric would not and could not compete with Freeman to any substantial degree. (J.S.App. 61a-62a, 65a.)

Third, because it faces vigorous competition from other large coal producers, the challenge of competing fuels, and large and sophisticated buyers across the bargaining table, a combined United Electric-Freeman neither has led, nor is likely to lead, to a lessening of competition. To the contrary, the testimony of knowledgeable industry witnesses confirmed that the combination had no anticompetitive effect. (J.S.App. 65a.) The Government, despite a diligent search, was unable to find a single customer or competitor who thought otherwise, although at the time of trial, the affiliation was well into its second decade.

Accordingly, the Government was forced to present a theoretical structural case, relying largely on statistical data. This Court has made it clear, however, that while statistical data is important, "only a further examination of the particular market—its structure, history and probable future—can provide the appropriate setting for judging the probable anti-competitive effect of the merger."[4] *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 322 n.38 (1962). It was on the basis of precisely such an examination, involving a careful assessment of *"all* of the evidence" (J.S.App. 2a, 18a, 53a, 61a, 64a, 66a), that the District Court concluded that the challenged combination did not offend Section 7.

[4] This is particularly true where, as was the case below, the statistics in question fail "to measure market strength or competition as it exists." (J.S.App.59a.) The myriad deficiencies in the statistics proffered at trial by the Government are catalogued in Defendant's Proposed Findings 374 through 385, A.989-92, and discussed at pages 64 to 69, *infra*.

I.

As is fully detailed in the trial court's opinion (J.S.App. 11a-27a), the change in the composition and character of those consuming coal since World War II has had a substantial impact on coal producers. As the diesel engine replaced the steam locomotive, and as natural gas and oil displaced coal in the home and industrial heating markets, coal ceased to be a product consumed by a large number of relatively small volume users.[5] The principal coal consumers today are the large utility companies which constitute coal's only remaining significant market. This market is predominantly served by large suppliers under contracts of five to fifteen years' duration and longer.

Uncommitted coal reserves are the essential key to competing for this business. It is such reserves—and not current production, profits, or cash flow—which provide the measure of a coal producer's viability in competing against the reserves of other coal companies and against the resources of suppliers of alternative fuels.

The evidence at trial showed, as the District Court found, that "virtually all of the economically mineable strip reserves of United Electric have been sold under long-term contracts, and United Electric has neither the possibility of acquiring more nor the ability to develop deep coal reserves." (J.S.App. 65a.)

Initially, the Government's principal contention on the reserve issue was that the coal reserves already owned by United Electric in the Industry and Round Prairie fields

---

[5] It is, of course, this dramatic change in the nature and number of coal consumers which accounts for the progressive disappearance of small coal producers. In light of this, the Government's analogy to the decline in the number of single store grocery operations found significant in *United States* v. *Von's Grocery Co.*, 384 U.S. 270 (1966), rings false, as its own economist recognized at trial. (Folsom A.1706.)

provided the key to a successful future, since they could be profitably developed by a "competent and unfettered management." (Government Supplemental Interrogatory Answers 46 and 47; DX 46, p. 40, A.Ex.334.) Subsequently, however, the Government confessed to the District Court that it was "inclined to agree" with the defendants' representation that "as of today they are not commercially valuable." (Transcript of Pre-trial Conference of October 3, 1969, p. 23, A.874.)

Retreating from its rose-colored view of Industry and Round Prairie,[6] the Government urged next that the simple solution to United Electric's shortage of commercially recoverable strip reserves was for the company to buy more. Geologists, mining engineers, company officials, other producers, and even its own economist, however, all testified to the fact that such reserves are unavailable for acquisition. (J.S. App. 63a.)

Recognizing the weakness of its secondary position, the Government announced a third: United Electric could survive by making a grass-roots entry into the deep mining of coal. Again, however, the evidence demonstrated that its experience as a profitable strip miner would not enable United Electric successfully to make a grass-roots entry into deep mining. (J.S. App. 61a.)

Confronted with these facts, the Government's Brief here announces yet a fourth position—the eleventh hour claim that evidence on the reserve issue related to the wrong time period. Once more, however, the record is to the contrary; it contains a wealth of evidence confirming that United Electric was in the same liquidating posture in 1959 as it was at the time of trial.

---

[6] Indicative of the extent of this retreat is that while the Industry and Round Prairie "issues" loomed large in the Jurisdictional Statement (pages 22-24) and Brief in Opposition to Motion to Affirm (pages 5-8), they are not even mentioned in the Government's most current brief.

This competitive demise of United Electric because of its critical reserve position is particularly significant when considered against the backdrop of other factors affecting coal producers. In determining what fuel to buy, for example, energy consumers can and do consider a wide variety of alternatives including, among others, coal, natural gas, oil, nuclear energy and hydropower. As is fully detailed in the opinion (J.S.App. 27a-53a), this was confirmed, not only by the responses to the subpoena questionnaire issued by the trial court, but by the testimony of a host of knowledgeable industry witnesses—including a representative cross-section of midwest utilities. Indeed, the evidence is clear that the present level of keen interfuel competition will intensify in the years ahead as public concern over the environmental impact of air pollution and strip mining increases and as technology for additional fuel sources continues to develop.

Other factors pertinent to an analysis of the likely competitive effects of the combination were disclosed in the evidence speaking to the size and sophistication of today's coal consumer—the electric utility. These utilities typically regard fuel purchasing as a top executive responsibility and purchase boiler fuel in such quantities that they can and do play the suppliers of one energy source against another, as well as one coal producer against another.

Such a market place stands in sharp contrast to the grocery market considered in *United States* v. *Von's Grocery Co.*, 384 U.S. 270 (1966), or the beer market in *United States* v. *Pabst Brewing Co.*, 384 U.S. 546 (1966). There, millions of individual consumers, each making relatively small purchases, had no bargaining power at all. To analogize the purchase and sale of 10 million tons of coal under a twenty year contract to the purchase and sale of a bag of groceries or a six-pack of beer belies common sense.

II.

The nature and extent of competition among coal producing companies is determined by such factors as the requirements and location of specific consuming facilities *vis-a-vis* the production capability and location of specific mines, and the available interconnecting transportation facilities. These "economic realities" concerning the role which both mine location and coal characteristics play in the competitive market place are especially significant to this litigation, since "[c]rucial to the Government's case is proof that United Electric and Freeman are actual or potential competitors." (J.S. App. 61a.)

United Electric's strip mines are located in different Freight Rate Districts and produce a different type of coal from the underground mines operated by Freeman. The results of the subpoena questionnaire issued by the District Court, as well as the testimony of consumers and producers, confirmed the significance of coal characteristics, that Freight Rate Districts serve essentially separate and distinct areas, and that Freeman and United Electric are predominantly complementary producers. This evidence compelled the conclusion that "an independent United Electric would not and could not compete with Freeman to any substantial degree." (J.S. App. 61a.)

III.

In the final analysis, what the Government really despairs of is nothing more than the trial court's refusal to accept its invitation to substitute a simple, but wholly inappropriate, statistical divining rod for a painstaking and thoughtful analysis of the "reliable, probative and substantial" evidence reflected in more than 17,500 pages of testimony and exhibits. It should be emphasized in this regard that the trial court did not substitute some *other* statistical divining

rod for that urged by the Government. Rather, the District Court's conclusion that "no adverse consequences with respect to competition were shown either to have occurred or likely to occur" (J.S.App. 64a) was based on a meticulous two-year review and evaluation of all of the evidence relevant to such a determination.

In making this assessment, there was simply no way that the vigorous interfuel competition that exists in the market place could be ignored. The District Court refused to blind itself to these competitive facts-of-life and followed this Court's admonition to "recognize competition where, in fact, competition exists." *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 326 (1962). See also *United States* v. *duPont & Co.*, 351 U.S. 377 (1956). Similarly, the District Court recognized that far more important than the particular labels identifying the geographical outbounds of the sections of the country, was granting full recognition to the extent to which the merging parties do and do not compete in analyzing the "crucial question" of the likely effects of their combination on competition. *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, 549-50 (1966).

Taking full account, then, of such "commercial realities" as the vigorous interfuel competition that exists in the market place and actual coal distribution patterns, the court below quite properly concluded that the longstanding Freeman-United Electric affiliation posed no threat to competition, and that this was true whatever the framework within which it was tested. Accordingly, the District Court, on the basis of the evidence presented at trial and detailed in its lengthy opinion, concluded with the specific holding that the challenged combination would not violate Section 7 "even were this court to accept the Government's unrealistic product and geographic market definitions." (J.S.App. 65a-66a.)

ARGUMENT

I.

SUBSTANTIAL EVIDENCE SUPPORTED THE DISTRICT COURT'S DETERMINATION THAT THE FREEMAN-UNITED ELECTRIC COMBINATION HAS NOT LED AND IS NOT LIKELY TO LEAD TO A SUBSTANTIAL LESSENING OF COMPETITION.

After "evaluation of the massive quantity of evidence submitted by the parties", the District Court below concluded that the Freeman-United Electric combination did not violate Section 7 of the Clayton Act. (J.S. App. 2a.)[7] As will be shown, this determination turned on resolution of a host of factual issues peculiarly within the province of the trier of fact and decided squarely against the Government.[8] These findings based on "reliable, probative and substantial evidence contained in the record" (J.S. App. 66a.) were not "clearly erroneous" and should be affirmed. *United States* v. *du Pont & Co.*, 351 U.S. 377, 381 (1956); Fed. R. Civ. P. 52(a).

A. United Electric Is Not A Competitive Factor.

At page 65 of its Brief, the Government itself recognizes the indisputable premise "that if a firm has ceased to be an

---

[7] "J.S." references are to the Jurisdictional Statement, and "J.S. App." references are to the opinion of the District Court as set forth in Appendix A thereto. "A." and "A.Ex." references are to the Joint Appendix and the Joint Appendix Exhibits to the Briefs before the Court. "DX" references are to defendants' exhibits; "GX" references are to Government exhibits; "Tr." references are to the trial transcript; and "Dep." references are to depositions. "DPF" references are to the Defendants' Post Trial Proposed Findings of Fact reprinted at pages 880-1016 of the Joint Appendix. "GPB" and "GRF" refer, respectively, to the Government's Post Trial Brief and the Government's Response to Defendants' Proposed Findings of Fact. Except where otherwise noted, emphasis has been supplied throughout.

[8] A full description of the nature of the evidence, the witnesses appearing, and the type of documents in the record, appears at DPF 9-48, A.887-99.

economically viable enterprise, its elimination cannot substantially lessen competition because it no longer is a significant competitive factor in the market." Indeed, the Government's own trial economist, on three occasions during his testimony, ventured his opinion that, without coal reserves or prospects to develop them, continuation of the combination would not be "adverse to competition" and United Electric "is not going to be in that situation a viable competitive force in this market, even if it is divested from General Dynamics." (Folsom A.1711, 1707-08, 1715.) This was precisely the reasoning followed by the District Court in its finding that the combination does not adversely affect competition because, in part, "United Electric can hardly be considered a competitive force" and "cannot contribute meaningfully to competition." (J.S. App. 63a, 64a.)[9]

This determination was made on the basis of a wealth of record evidence on key *factual* issues at trial. This evidence established that: (1) Because the utility market will undoubtedly remain the only substantial outlet for coal production, the key factor determining a producer's strength is coal reserves; (2) United Electric does not have the coal reserves to be considered a competitive force; and (3) United Electric has neither the possibility of acquiring more strip reserves nor the ability to develop deep coal reserves. In addition, (4) other industry forces at work make it inconceivable the combination could have an adverse effect on competition. (J.S. App. 63a-65a.)

1. Reserves Are The Key Factor In Measuring A Coal Producer's Market Strength.

Among the District Court's uncontested findings was that "[a]s a result of market losses to other forms of energy, the

[9] As is discussed hereinafter, pages 69 to 76, these findings were based on facts dating back to the early 1950's and not merely conditions prevailing at the time of trial.

utility market has become the mainstay of coal production." (J.S. App. 12a; Gov't. Brief, p. 4.) The evidence was that this market "will undoubtedly remain the only substantial outlet for coal production."[10]

In view of this, the focus of the court's scrutiny of the combination's effect on consumers centered on the utility market, as did the evidence adduced by both sides.[11] As a result, the trial court carefully analyzed the way in which coal was bought and sold in this market, and the manner in which coal producers competed for the custom of electric utilities.

Because of the need to have assurances of a steady supply of the required quantity of coal over a long period of time, and at an established cost, it was found that utilities typically arrange long-term contracts for all or at least a major portion of the total fuel requirements for the life of a generating plant.[12] As the court noted with respect to the coal purchased by Midwest utilities in 1967:

---

[10] J.S. App. 64a; see DX 216, A.Ex.1215; Gallagher Dep.Ex.1-3, A. Ex.1416; Steiner Dep.Ex.2, ¶ 2, A.Ex.1828-29. See, generally, DPF 146-166, A.925-30. The Government states at page 26 that "[t]he market for coal is therefore effectively confined to electric utilities and other large fuel users, such as cement manufacturers . . . ." However, the trial court reviewed the continuing "trend of industrial consumers away from coal" (J.S.App. 30a-32a) and the evidence was that the kilns of cement companies are fired by gas, oil or low-sulphur coal which United Electric cannot produce. See Steele A.1281; Morris A.1151-52; DX 68, 69, 70, 74, 75, 76, 78, 242, A.Ex. 587, 588, 590, 600, 603, 604, 608, 1291.

[11] This is not to say the smaller consumer segments were not scrutinized as well. See J.S. App. 30a-32a; see, generally, DPF 205-210, A.941-43; DPF, 317, 319, 324, 326, 331, 333, 338, 340, A. 972-78; Redard A.568; H. E. Petersen A.365; Stipulated Testimony of Knecht (A.851), Sinclair (A.838), Sant (A.870) and Hemminger (A.869).

[12] See Gamble A.1336-37, 1341-43; Corey A.1417-19; Hill A.1302-05; Tomey A.1111-13; Davis A.1200-01; Schotters A.640-41; Nicosin A.516-17; Ward A.551-52; Gerber A.774-75; DX 86, p.3, A.Ex.736; DX 93, A.Ex.889.

> "[*I*]*t is undisputed that approximately 76 percent was purchased under contracts of five years or longer and 43 percent was purchased under contracts of 15 years or longer duration.*" (J.S. App. 22a; emphasis, the court's.)

Before entering into such long-term contracts, it was found, and admitted by the Government, that a utility normally seeks independent, geological verification of the existence and size of the supplier's coal reserve to assure itself that the supplier is capable of supplying the required quantity.[13] One utility executive emphasized that when a utility is arranging for a fuel supply for a modern generating station representing an investment of several hundred million dollars, it wants "to know that the people you sign a contract with are able to produce on their end of it." (Tomey A.1113; see also Gamble A.1343.)

In the wake of this evidence, it was found that the competition for the business of utilities was not for the sale of coal already produced, but for long-term contracts:[14]

> "Because of the trend toward long-term contracts and away from spot purchasing, competition in the electric utility market is not continuous in the sense that coal producers seek new orders from a given facility on a daily, monthly or even annual basis. Rather, competition tends to be a 'one time thing.' Once the initial coal contract is executed, competition to satisfy the coal requirements of a particular plant is effectively precluded for an extended period of time amounting to as

---

[13] J.S. App. 20a-21a; GRF, p. 48. See Hill A.1309; Gamble A. 1343; Wood A.1193; Steele A.1278-79; DX 86, p.4, A.Ex.737.

[14] This Court has recognized the wisdom of such long-term contracts: "In the case of public utilities the assurance of a steady and ample supply of fuel is necessary in the public interest." *Tampa Electric Company v. Nashville Electric Co.*, 365 U.S. 320, 334 (1960); see also the dissenting opinion of Judge Weick in the Court of Appeals' decision in that case, 276 F.2d 766, 776 (6th Cir. 1960).

much as 15 years or even the full life of the plant." (J.S. App. 23a-24a.)

In this rivalry, it is obvious that a coal producer without sufficient reserves cannot effectively participate. This proposition was repeatedly confirmed by the experts, consumers and producers who testified,[15] and was recognized by the Government itself in fashioning the consent decree entered in *United States* v. *Peabody Coal Co.*, 1967 Trade Cas. 84,376 (N.D. Ill. 1967). (DX 84, A.Ex.640.) Central to that decree were the provisions requiring Peabody to divest itself of an operating coal business having no less than 120 million tons of reserves and prohibiting Peabody, for five years, from acquiring more than 5 million tons of coal reserves per year from any other producer.

In sum, it is beyond dispute that the critical determinant of whether a coal company can offer effective competition as a supplier is the level of verifiable, substantial and uncommitted coal reserves under its control. As one utility executive put it:

> "[I]n the long range competitive picture, one of the big things is to assure ourselves of the proper reserve situation. We don't go into contracts with those or consider them competitive under this situation, unless they have the reserves to back it up and we can count on them down the road." (Wood A.1178. See also Wood A.1191-92; Corey A.1419-20; Davis A.1213; Steele A.1274-75; Schotters A.640-41.)

On the basis of all the evidence, the trial court was undoubtedly correct in its determination that coal reserves

---

[15] Sherwood A.1373-74, 1377; Folsom A.1706; Steiner A.1576-77; Tomey A.1111-14; Moser A.1391; Steele A.1267-69, 1278-79; Wood A.1177-79, 1187-88, 1193; Davis A.1200-01, 1204, 1224-25, 1227-28; Camicia A.1370-71; Abrahamson A.672; Morris A.101-02, 122-23; Steiner A.799-802; DX 26, A.Ex.249; DX 77, A.Ex.607; DX 86 (pp.3-5), A.Ex.736-38; DX 112, A.Ex.1015.

were "the key factor in a coal producer's market strength." (J.S. App. 65a.)

2. United Electric Does Not Have The Coal Reserves To Be Considered A Competitive Force.

United Electric's present rank is next to last in coal reserves (regardless of mineability) among the ten "leading" producers identified by the Government.[16] In addition, United Electric was found to control *less than one percent* of the total Midwest reserves controlled by all 37 coal producers in Illinois, Indiana and western Kentucky. (DX 61, A.Ex.577; GX 72, A.Ex.91; GX 85, A.Ex.98.)

Of the six mines which United Electric operated in 1948, four have since been closed, as have two others opened in the interim. The Mary Moore mine lasted only 10 years and closed in 1965 upon the exhaustion of strippable reserves earlier than predicted.[17] The Company's Cuba mine, opened in the 1920's, was closed in 1971[18] as the trial court had anticipated; the Banner mine, opened in 1960, will close in the fall of 1973, two years *earlier* than both the defendants and the court had expected. (J.S. App. 7a; DX 60(d), A.Ex. 568.)

Typical of the wide gulf between fact and the Government's view of things that has characterized these proceedings, the Government denied that the Cuba and Banner mines would shortly close (GRF, p. 8), and blithely asserted that "UEC personnel have drastically underestimated the remaining coal reserves around UEC mines." (GPB, p.

---

[16] Companies producing annually more than 300,000 tons in Illinois or more than 1,000,000 tons in the Midwest were defined by the Government as "leading" producers. See note 1 to both GX 72 and GX 85, A.Ex.91, 99.

[17] See Morris A.1077-78.

[18] See 1971 Annual Coal, Oil and Gas Report, Illinois Department of Mines and Minerals, pp. 18, 24-25.

129.) They contended that Banner would last at least another seven and a half years, and that substantial additional reserves around the mine would undoubtedly be acquired. In fact, the Government urged that *all* of the reserve fields of United Electric had additional mineable coals which defendants had not included in their estimates. (*Id.* at 128-33.) The trial court decided this head-on factual controversy squarely against the Government, preferring, as it did throughout, the views of knowledgeable, experienced coal mining personnel to the lay speculation of Government counsel.

The fact remains, as was found, that United Electric will shortly be down to two mines; that its mineable reserves stood at 52 million tons at the time of trial and that *"all but 4 million tons of the economically recoverable coal reserves of United Electric have been sold under long term contracts"*—the equivalent of about nine months' production. (J.S.App. 9a; emphasis, the court's; see DX 63, A.Ex.579.) Here again, the latter fact was denied by the Government at trial and the assertion is repeated here. The present claim (Gov't. Brief, p. 10, n.7) that 11 of the 52 million tons shown on Defendants' Exhibit 63 are not in fact committed because they are only in "negotiation," simply overlooks the trial testimony of the president of United Electric. Frank Nugent testified that since the exhibit had been prepared, one of the contracts involving this tonnage had actually been signed, and agreement reached on all essential terms in the two others. (Nugent A.1519-20.)

If any doubt remained that United Electric had reached the end of its reserves, it was dispelled by the evidence that United Electric's plight was well known within the industry, beginning in the late 1950's. For example, the president of a utility that had been purchasing coal from United

Electric for more than 25 years testified that "a number of years ago I reviewed with our operating people, our production people, the problem that we saw on the horizon, which was the diminishing reserves situation with United Electric." (Steele A.1268-69.)

The record abounds with this type of evidence. United Electric had been advised by some of its customers that it was no longer considered a competitor for any future business,[19] and a contract extension proposed by United Electric in 1965 was returned unsigned with the customer's admonition that it "would be meaningless in view of the limited Fulton County reserves that are controlled by your Company." (DX 26, A.Ex.249.) Other internal documents of the company, antedating the filing of the complaint, confirmed United Electric's debilitated reserve position. (See DX 23, A.Ex.241; DX 112, A.Ex.1015; Nugent Dep. Ex. 35, p.3, A.Ex.1788.)

Finally, the Government's cross-examination of A. H. Davis, President of Central Illinois Light Company, one of United Electric's major customers, provides a succinct commentary on the critical nature of United Electric's reserve problem:

> Q. "So, are you in any position to say that if United Electric and Freeman were merged, that they would have no effect on CILCO in the future?"
>
> A. "Well, we have studied the United Electric reserves, Mr. Sims, and we just can't see where United Electric has the reserves to be a factor in the coal business, as far as we're concerned." (Davis A.1213.)

---

[19] See DPF 88-89, A.909; Morris A.1065-66, 1138-41; Steele A.1268-69, 1278-79; Wood A.1177-79, 1193; Davis A.1204, 1224-25; Moser A.1391; Abrahamson A.672; Morris A.101-06; DX 77, A.Ex.607; DX 112, p.8, A.Ex.1016.

3. United Electric Has Neither The Possibility Of Acquiring More Strip Reserves Nor The Ability To Develop Deep Coal Reserves.

Strip Reserves. The finding by the trial court that "United Electric's coal reserve prospects for the future are singularly unpromising" (J.S. App. 63a) resolved against the Government another deeply disputed fact in the case. As with the other pivotal factual issues, this finding was based on a wealth of credible, competent evidence. The trial court had before it the testimony on the subject of three expert geologists (one a high government official), evidence from coal producers (including one called to the stand by the Government itself),[20] the testimony of coal consumers[21] and the testimony and documents of the defendants.[22]

Specifically, the report prepared by expert geologist John Organ[23] concluded that "such economically mineable strip reserves as exist within the Illinois basin [Illinois, Indiana and west Kentucky] are under the control of existing producers, and . . . such other strippable acreage that has not been acquired holds no competitive promise." (DX 88, A.Ex.796.) Comparably, the Principal Geologist of the Illinois State Geological Survey stated that "[s]o intense has been the interest in the more favorably situated strip

---

[20] Sherwood A.1373-74; Hopper A.1503; Organ A.686-89; Nugent A.62; Stipulated Testimony of George H. Shipley, A.848.

[21] Schotters A.648-49; Dorrance A.394.

[22] Morris A.1137; Ames A.1454; Thorson A.1167; Camicia A.1368-70; Camicia A.93; Nugent A.57-62; Inman A.199-200, 202-03; DX 23, A.Ex.241; DX 112, A.Ex.1015; Nugent Dep. Ex. 35, p.3, A.Ex.1788.

[23] The Government admitted that Mr. Organ's principal occupation since 1932 had been the exploration or acquisition for others of coal lands and mining rights, that he had been responsible for the development of numerous strip coal fields and had made on-site investigations in virtually every coal producing county in Illinois, Indiana and west Kentucky. See DPF [redacted], A.894, and GRF, p.3.

reserves, that I do not know of any prime acreage that is not now under control." (DX 34, A.Ex.259.)

An exhaustive analysis prepared by Paul Weir Company (DX 87, A.Ex.751) concluded that (a) the *last* unmined major reserve of strippable coal in the Midwest was now under development, (b) that no new comparable strip operations would be developed and that (c) operators "have been unable to find economically strippable reserves not now controlled by others." This report confirmed its earlier opinion that contiguous coal reserves over 10 million tons were not available in Illinois for purchase from non-operating owners. (Letter attached to DX 87, A.Ex.791.) The Government admitted that this *was* the opinion of Paul Weir Company (acknowledged by a Government witness to be one of the most widely known and highly regarded mining engineering companies in the world),[24] but, typically, the Government denied that the opinion was accurate. (GRF, p. 209.)

There was also direct testimony by executives from Amalgamated Industries (a pseudonym to protect trade secrets) and Humble Oil and Refining Company that their own search for mineable strip coal in Illinois had been unsuccessful. (Dorrance A.394; Stipulated Testimony of George H. Shipley, A.848.) In addition, two Government witnesses confirmed the unavailability of strippable reserves: Mr. Hopper of Ayrshire Collieries recognized that "it is common knowledge within the coal industry that strip reserves available for acquisition are in extremely short supply" (Hopper A.1503), and the Government's own trial econo-

[24] Hopper A.1504. The Government also admitted that Paul Weir Company had served for 31 years as mining engineers and geology consultants for the Federal Government, coal producers, railroads, electric utilities, mineral ore firms and financial institutions. GRF, p.3.

mist, James Folsom, was forced to concede that "this record indicates that high quality strip reserves are relatively scarce in Illinois." (Folsom A.1693.)

Deep Mines. The Government also quarreled with the assertions by defendants that United Electric had no experience in deep mining, no ability to develop deep coal reserves and no likelihood of acquiring deep coal mining expertise. Here again, defendants carried the day on these factual issues with a wealth of evidence from a variety of sources.

The trial court held that "United Electric is a strip mining company with no experience in deep mining nor likelihood of acquiring it." (J.S. App. 61a.) These findings were in turn supportive of the court's conclusion that United Electric was not a competitive force: neither the limited marginal deep coal reserves controlled by United Electric,[25] nor those that might be available for purchase in the Midwest, would be of any help to an independent future for the company.

The evidence sustaining these findings may be summarized as follows:

Deep Mining Experience. As observed by the 10th Circuit in the *Kennecott* case, the "essentials" for new entry into the coal business are "extensive reserves and ready ability to deliver," "experience, know-how and equipment." *Kennecott Copper Corp.* v. *Federal Trade Commission*, 467 F.2d 67, 74 (10th Cir. 1972). With respect to deep mining, United Electric has none of these.

---

[25] The evidence was that United Electric's only deep coal reserve field, Round Prairie, was not commercially mineable by *anyone* in the near future. See DPF 428-30, A.1004; Nugent A.63-65; Camicia A.77-78, 91-93; Morris A.118-19. See also Camicia A.1364-65; Hopper A.1493, 1499-1501. The Government admitted these reserves "may not be commercially mineable at the present time." GRF, p.220.

At the time of its affiliation with Freeman, United Electric had been strictly a strip mining company; it had acquired neither the equipment, personnel, nor expertise required for successful entry into deep mining.[26] The company had stated in its 1956 Annual Report that, "For thirty-eight years your Company has been engaged in a single business—mining bituminous coal by the strip or open pit method. . . ." (Kolbe Dep. Ex. 2, p.7, A.Ex.1526.) Frank Kolbe, United Electric's chief executive from 1939 to 1959, repeatedly proclaimed that "underground mining is not our business," and that to have gone into deep mining would have been "something completely new."[27] As the Government admitted, United Electric's two attempts in the 1950's to engage in drift mining[28] were short-lived and unsuccessful (GRF, p.19): one lasted two years and "failed miserably", and the other involved only the purchase of an experimental mining machine which never worked and was junked.[29]

Deep Coal Reserves. Prior to July 31, 1958, United Electric had never acquired any deep coal reserves that had not been part of strip acreage at existing mines. The deep reserves they did control at that time were all adjacent to

---

[26] See DPF 100-15, A.912-17; Morris A.1049-53; Camicia A.1360-61; Ames A.1450, 1453-54; Thorson A.1167-68, 1258-59; Morris A.107, 111-13, 116; Camicia A.94-95; Inman A.186-88, 202, 206-09; Tarzy A.242-45.

[27] Kolbe A.135-37. See also Kolbe A.162-63; DX 1, A.Ex.197; DX 6, A.Ex.209; DX 8, A.Ex.212; DX 220, A.Ex.1225; DX 221, A.Ex.1226; DX 222, A.Ex.1227; Kolbe Dep.Ex.W, A.Ex.1639-41; Kolbe Dep.Ex.X, A.Ex.1642; Kolbe Dep.Exs.12-13, A.Ex.1533-34.

[28] Drift mining involves merely punching into an already exposed seam of coal, usually from the pit floor of a strip mine. See Camicia A.1358-60.

[29] Morris A.113; Tarzy A.267-68; Kolbe A.159-62; DX 1, A.Ex. 197; Kolbe Dep.Exs.55 (p.5), 57 (p.6).

their strip operations; in any event, these amounted to only 17 million tons, of which 5 million had just been acquired solely in order to obtain contiguous strip reserves.[30]

After July 31, 1958, as the evidence showed, United Electric did begin to acquire deep coal reserves in the so-called Round Prairie Field. This activity was traceable to the growing contact between Freeman (an experienced deep coal miner) and United Electric, and was built upon United Electric's then current undertaking to acquire deep coal reserves as nominee for one of its customers.[31]

The evidence further demonstrated that United Electric never gave serious consideration to any deep coal reserves until the management of Freeman and United Electric became closely associated and, in fact, since 1958, United Electric made it a practice to seek Freeman's advice regarding any deep mining possibility.[32] Finally, it was not until its 1961 Annual Report that United Electric for the first time disclosed to its stockholders that it controlled deep coal reserves. (Kolbe Dep.Ex.7, p.7, A.Ex.1532.)

Deep Mining Potential. The evidence was overwhelming that there was no reasonable probability that United Electric could successfully undertake deep mining and, therefore, no reasonable probability that it would try. This

---

[30] Morris A.1080-81; Morris A.123-24; GX 23; DX 60(b), A.Ex. 518.

[31] Morris A.1054-56; Ames A.1453-54; Kolbe A.141-42, 177-79; Dorrance A.392; Inman A.200-02, 204-05; Sloane A.361-62; DX 5, A.Ex.206.

[32] Ames A.1456; Thorson A.1167-68, 1258-59; Morris A.1054, 1083-84; Nugent A.1478; Inman A.204-06, 210-11; Tarzy A.266-69; Morris A.112-17, 119-20; DX 14-18, A.Ex.226-234; DX 21, A.Ex.238; DX 25, A.Ex.247; DX 28, A.Ex.252; DX 32, A.Ex.256; DX 113 (p.4105), A.Ex.1031; Morris Dep.Exs.4-5, A.Ex.1680-82; Morris Dep.Ex.32, A.Ex.1688; Morris Dep.Ex.35, A.Ex.1689; Morris Dep. Ex.42, A.Ex.1691; Morris Dep.Ex.46, A.Ex.1693; Morris Dep. Ex. 55, A.Ex.1695; Morris Dep.Ex.62, A.Ex.1712.

evidence consisted of the opinion of Paul Weir Company, expressed in the Report referred to above (DX 87, A.Ex. 751), the testimony of others experienced in the field, and the views of coal consumers. As the Weir report concluded,

> "While it is, of course, impossible to state for certain whether or not United Electric would even have attempted to undertake deep mining, it is improbable that they could have done so successfully, and, therefore, highly unlikely that they would have tried. This would have been true even if United Electric had had the best deep-mining reserves to work with." (DX 87, pp.29-30, A.Ex.781-82.)

As the evidence showed, United Electric's strip mining experience would be of no value to it in attempting to undertake deep mining. There is virtually no phase of the expertise acquired in strip mining than can be carried over to deep mining, and there is no correlation between the engineering and know-how related to each. (Camicia A. 1360-61.)

Strip mining is in many ways analogous to the earth moving which road contractors perform. While deep mining is very difficult and highly technical, strip mining involves none of the elements of shaft and hoist construction, underground roof conditions and maintenance, gas emission, drainage, ventilation, extrication methods, mine safety problems or equipment peculiar to deep mining. Because of these complexities, deep mining entails risks unknown to strip mining, and the failure of deep mines because of bad judgment is not infrequent.[23]

---

[23] See DPF 413-420, A.1000-02; Camicia A.1359-60; Gaunt A.588-89; Kolbe A.156-58. Precisely on point is the fact that Freeman's deep coal mine "Crown" had to be abandoned in 1971. See 1971 Annual Coal, Oil & Gas Report, Illinois Dept. of Mines and Minerals, p.18. The Crown mine had produced 1.8 million tons in 1970. See 1970 Annual Coal, Oil & Gas Report, Illinois Dept. of Mines and Minerals, p.18.

Nicholas T. Camicia, President of Pittston Company (one of the world's largest deep mining coal producers), and a past president of Freeman-United Electric, testified at trial. On the basis of his professional knowledge and expertise as a deep mining engineer and executive, and his familiarity with United Electric's capabilities and personnel gained while serving as the company's president, he did not see how United Electric could possibly make a successful entry into the deep mining of coal:

> "You can go out and pick up any kind of construction worker and start up a strip mine. But in deep mining it is a very different business, and it takes a different type of person, even insofar as attitude."[34]

It was Mr. Camicia's conclusion that United Electric "certainly was not in a position to go into a deep mine venture" and that "they would have made a mistake if they had tried." "I don't see how they could even make a start at it." (Camicia A.1365-66, 1361.)

An additional factor that would make a deep mining attempt by United Electric even more unlikely was the grave doubt that utility companies or any other large buyer of coal would be willing to enter into a contract for underground coal with a company with no experience. As one utility president testified, "we always have felt or thought of United Electric as a strip mine company, not having any prior experience with deep mining, I would say that we would be hesitant about entering any commitment for coal from an unknown source, so to speak." (Steele A.1279-

---

[34] Camicia A.1360-61. One United Electric executive put it this way: "We are afraid. If you told me . . . that starting tomorrow you can't do what you are doing, we are going to send you down to train to be the superintendent for an underground mine, I would say, 'Uh-uh, I am on my way. Just get another boy.' " Tarzy A.244.

80.) The testimony of other consumers reflected the same viewpoint.[35]

Confirmation of the above analysis resided in the observation that, with the single exception of the recent venture by the world's largest industrial corporation,[36] there was no evidence that any company had ever attempted to make a grass-roots entry into deep mine coal operations in recent history in the Midwest.[37] The Government had claimed at trial that Ayrshire Collieries had done so, and one of its executives was called by the Government as a witness. He related, however, that Ayrshire had opened a deep mine only *after* acquiring two deep mine coal companies and even then the mine had been a failure and should not have been built. (Hopper A.1495-97.) This Government witness also concluded that United Electric "would be in a very awkward position" were it to attempt underground mining. (*Id.* at 1509.)

Faced with this abundance of evidence, the Government is left in its brief with the observation that "United Electric has had both the *financial* resources and general *marketing* experience necessary to enter deep mining." (Gov't. Brief, p. 72.) But the evidence showed that these attributes were simply not enough; more is required to enter deep coal

---

[35] Moser A.1403-04; Tomey A.1114-15; Gaunt A.588-89; Abrahamson A.663; Sloane A.359-60; Morris A.119.

[36] Both common sense and the Government's own prior observations belie the validity of any parallel (Gov't. Brief, pp. 72-74) between what Humble Oil, subsidiary of Standard Oil Co. (New Jersey) would do and could do, and what an independent United Electric might successfully undertake. In their Briefs and proposed findings (DX 81-83, A.Ex.617-39) in *United States* v. *Standard Oil Co. (New Jersey)*, 253 F.Supp. 196 (D.N.J. 1966), the Government pointed out that there is no correlation between Standard Oil's ability to make a grass-roots entry into deep mining and that of a smaller company attempting a similar venture. (*Id.* at 200, 208, 223, 227.)

[37] See Nugent A.72; Camicia A.1362.

mining successfully than money and the ability to sell coal, as the record amply demonstrates.

Based upon the entire record, we respectfully submit that the District Court's resolution of the factual issues concerning United Electric's bleak and irremediable future were clearly correct.[38] The finding that United Electric was not and could not become a viable competitive force stands unshakable. This is apparent, we suggest, from the Government's confession in its Brief (page 2, note 1) that "[t]he focus has been shifted [since its Jurisdictional Statement] from the evidentiary support for the finding to its legal sufficiency as a basis for concluding that the merger would have no anticompetitive effect." The Government is reduced, in the end, to musing that it is "hard to believe" that United Electric "would idly sit by and allow its entire coal business to disappear."[39] This incorrectly states the

---

[38] Contrary to the Government's representations that these findings and the evidence in the record related solely to the time of trial (Gov't. Brief p.71), United Electric's reserve crisis was shown to have existed in the 1950's and its inability to acquire additional reserves was established by evidence relating to that period and throughout the 1960's, as well as to the time of trial. See discussion at pages 69 to 76, *infra*.

[39] Gov't. Brief. p. 73. Apparently, however, this not infrequently happens. Little Dog Coal Company, according to the Government a "leading" producer in 1967, abandoned operations the following year. Compare GX 72, A.Ex.91, with Beck Dep. Ex.1, A.Ex.1411. The Government offered no explanation as to what happened to its other "leading" producers Mid-Continent Coal Corporation, Lumaghi Coal Company, Saxon Coal Corporation, Young's Coal Corporation, Crab Orchard Cooperative Coal Company, J.W. Coal Company, Big Muddy Coal Company, Ajax Coal Company, Jo-Lor Mining Company, or Snow Hill Coal Corporation (all of which have apparently abandoned operations)—other than to show that they were not acquired by other Midwest coal producers. Compare GX 87, A.Ex.101 with GX 62-86, A.Ex.81-100, DX 46, A.Ex.295.

issue[40] and, in any event, manifestly fails to overcome the compelling force of the evidence.

4. Other Industry Forces At Work Make It Inconceivable The Combination Could Have An Adverse Effect on Competition.

In the context of United Electric's terminal condition in an industry marked with intense competition, only blind adherence to numerology can foster a belief that the Freeman-United Electric combination poses *any* threat to competition, much less the "substantial" one required by Section 7.

In reviewing the pressures it deemed "crucially relevant to its assessment of the competitive effect of the United Electric-Freeman combination," (J.S. App. 53a), the District Court found that the intense competition which Midwest coal producers face is likely to increase even more (J.S. App. 18a) in light of:

(a) competition from nuclear energy and other alternative fuels (J.S. App. 27a-41a);

(b) the growing concern with the environment which will greatly disadvantage companies, like United Electric, that produce only low quality, high sulphur coal (J.S. App. 41a-53a);

(c) pressures from large, informed and capable buyers of coal (J.S. App. 18a-27a); and

---

[40] While United Electric has no future in the Midwest, it is not going to let its coal business disappear. It has coal reserves in Oklahoma and Colorado to which it has now turned its attention as well as to other opportunities in the West; this is obviously where the company's future resides. See J.S. App.61a; Tarzy A.282-90; Tarzy Dep. 429-38; Inman A.202-03; Jensen A.291-92; DX 29, A.Ex.253; DX 31, A.Ex. 255; DX 60(a), A.Ex. 517. By agreement of the parties, United Electric's western reserves were not an issue in the litigation. See J.S. App. 9a, n.8; DX 47, ¶42, A.Ex.339; A.1135-36.

(d) the presence of a substantial number of viable coal producers, many with multifuel capability. (J.S. App. 16a-18a.)

Given these industry forces at work, United Electric, with only 4 million tons of unsold coal, just cannot affect the level of competition in its markets, one way or the other.

Interfuel Competition. Based upon Government reports and studies,[41] the statements of Government officials,[42] energy experts,[43] trade association executives,[44] and a wealth of other evidence,[45] the trial court fairly concluded that:

> "Interfuel competition will continue to erode coal's share of the energy market as more and more industrial consumers convert from coal to gas or oil, and as these fuels, along with nuclear energy and the emerging technology of still other alternative power generation sources, further challenge coal's share of the fuel needs of electric utilities." (J.S. App. 28a.)

While its Brief to this Court quibbles with the intensity of interfuel competition in the Midwest, the Government concedes "[t]here may well be an energy market" (page 20) and time and again acknowledges the effects of interfuel

---

[41] DX 102, A.Ex.921; DX 103, A.Ex.996; DX 107, A.Ex.1003; DX 108, A.Ex.1008; DX 109; DX 110, A.Ex.1011; DX 115; DX 116, A.Ex.1042; DX 257, A.Ex.1381.

[42] DX 45, A.Ex.287; Testimony of Ernest B. Tremmel (AEC), A.1229-55; E. C. Hill (TVA), A.1290-1314; Aldo P. Brazzale (GSA), A.425.

[43] Dr. Bruce C. Netschert A.731, and DX 89, A.Ex.798; Abraham Gerber A.764, and DX 86, A.Ex.733; S. Smith Griswold A.706, and DX 87, A.Ex.751; George Gamble A.675. The qualifications of these experts are set forth in DPF 28, 39-41, A.892, 895-97.

[44] Harold S. Walker, American Gas Association, A.465 and Winfred C. Peterson, National Oil Fuel Institute, A.446.

[45] See, generally, DPF 192-282 (A.938-63) and the evidence referred to therein.

competition.[46] In view of the evidence in the record, recognition that coal has in the past, does in the present, and will in the future face intense competition from suppliers of alternate fuels is inescapable. The trial court's detailed and reasoned description of this battle (J.S. App. 27a-41a) well summarizes the evidence and needs not to be repeated here. Suffice it to say that the Government's own trial economist testified that "the customers in this case all—all the utility customers have indicated that they consider all sources of fuel in making the decision. . . . They did not say that they considered the primary competition coal with reference to future facilities, certainly." (Folsom A.1703.)

Victor Wood, Superintendent of Fuel Procurement for Northern States Power, articulated the realities of the situation:

> "Certainly competition between coal suppliers is a big factor, but I believe overriding this, which sets the over-all competitive picture, is the alternate fuel competition. There is competition among all fuels as well as among coal suppliers." (Wood A.1188).

This was similar to the views of Gordon Corey, Chairman of the Finance Committee of Commonwealth Edison:

> "Q. In your opinion, Mr. Corey, what is Commonwealth Edison's major concern with respect to competition among its fuel or energy suppliers?
>
> "A. I guess it is to have adequate competition and as the energy field gets more diverse, it is hopefully to continue to have effective competition between coal and oil and nuclear. I believe that is one way of putting it." (Corey A.1420.)

It was accordingly concluded by the trial court, supported by the views of defendant's economist Dr. Peter O. Steiner,[47]

---

[46] Gov't. Brief, pp. 3-4, 14-15, 22, 24-28.

[47] For Dr. Steiner's qualifications, see DPF 42, A.897-98.

that this intense level of interfuel competition was necessary to any valid predictions concerning the coal industry's future: "Because interfuel competition particularly provides utilities with a strong bargaining weapon in negotiations with coal producers, this competition exerts strong pressure on the market in which coal producers sell their form of energy."[48]

The role of this factor in predicting the future effect of the Freeman-United Electric combination on competition is clear: the level of that competition is so significantly influenced by the rivalry among various forms of energy that it belies common sense to contend that a competitively moribund coal producer like United Electric even enters the picture.

Concern With The Environment. The court found, on the basis of the substantial evidence in the record concerning environmental controls,[49] that "[t]he air pollution restrictions adopted throughout the midwest are substantially increasing the already intense competition which coal faces from other fuels." (J.S. App. 43a.) Moreover, the court observed, electric utilities and other large coal consumers will not be able to avoid air pollution restrictions by locating future facilities in rural areas in view of the demand for state-wide controls.[50] Even when commercially acceptable pollution control devices become available,[51] the capital and operating

---

[48] J.S. App. 53a-54a. See Steiner A.812-13, 1581; Steiner Dep. Ex. 2, ¶12, A.Ex.1834-35.

[49] Middleton A.381-82; Middleton Dep. 5-6; Moore A.614-16, 621-22; Stanley A.486-87; Netschert A.748-49; Griswold A.714-15, 719-20, 725-26; DX 71 (p.2), A.Ex.592; DX 85 (p.2), A.Ex.648; DX 90 (p.2), A.Ex.867; DX 136, A.Ex.1085; DX 139-43; DX 151-57, A.Ex.1120-35; DX 234 (p.6), A.Ex.1266; DX 254 (p.1), A.Ex.1306; Middleton Dep. Exs. 1,3.

[50] Moser A.1389-91; Moore A.619-20; Schotters A.646-47; Netschert A.747-49; Griswold A.729-30.

[51] See, generally, DX 89, A.Ex.798; DX 254, A.Ex.1298.

costs involved may well lead to the exclusion of coal from the competitive picture for some utilities in favor of other fuels.[52] (J.S. App. 41a-51a.) Finally, many of the governmental restrictions adopted to date have taken the form of banning the burning of high-sulphur coal altogether.[53] This has been particularly grievous in the case of producers, such as United Electric, who produce only high-sulphur coal. (J.S. App. 52a.)[53a] As one utility executive put it, "Air pollution is getting to be the overriding issue."[54]

The essential point here is that environmental controls will handicap coal producers in their ability to compete. Illustratively, United Electric's largest former customer—Commonwealth Edison—testified at trial that "we have sort of put our eggs in the nuclear basket" and that the move toward nuclear power "is the best way to take care of our massive electric power generation problems with a minimum of disturbance to the environment." (Corey A. 1414.) Moreover, because of its low-sulphur coal program, Edison has begun "phasing out" its high sulphur coal producers. "As you know," Finance Committee Chairman Corey testified, "the United Electric contract expires this year and has not been renewed." (*Id.* at 1437-38.)

---

[52] Steiner A.1624-26; Wood A.1190-91; Corey A.1413; Nugent A.1522-23; Netschert A.748; DX 89, pp.23-24, 61-63, A.Ex.822-23, 860-62.

[53] Griswold A.717-19; DX 89, pp.13, 14 (Table 2), 15 (Fig. 1), 23, A.Ex.812-14, 822.

[53a] The trial court found in this regard that, because of air pollution regulations, United Electric "will not be able to serve [the Chicago area] market." (J.S. App.62a; see also J.S. App.58a.)

[54] Tomey A.1130. See, generally, DPF 246-282, A.952-63. See also Steele A.1267-68; Wood A.1175-76, 1190-91; Davis A.1199-1200, 1207-08; Moser A.1389-91; Corey A.1414-16; Hill A.1313; Gamble A.1350-51; Schotters A.642-43; Petersen A.368-71; Morrison A.607-08; Ward A.560; Redard A.570-71; DX 71, A.Ex.591; DX 176, A.Ex.1158; DX 178, A.Ex.1160; DX 179, A.Ex.1161; DX 187-88, A.Ex.1169-70; DX 191-92, A.Ex.1173-74; DX 234 (pp.6-7), A.Ex. 1266-67; DX 238, A.Ex.1278; DX 239, A.Ex.1279.

Customers. The court found that mergers within the utility industry had both diminished the number of utility companies and had increased the purchasing power of those surviving. In light of the fact that fuel expenditures were a major component of a utility's operating cost, it was also found, and admitted by the Government, that utilities regarded fuel purchasing as a major executive responsibility, exercised with great sophistication and knowledge. (J.S. App. 24a-26a; GRF, p.54; DPF 187, A.936-37.) Witness to this bargaining power was the testimony of executives of all the significant coal users in the Midwest, including Commonwealth Edison, the Tennessee Valley Authority, and 12 other utility customers of Freeman or United Electric.[55] These fourteen firms consumed about 70 million tons of coal in 1967, an amount 10 percent greater than the *entire* Illinois production of coal that year, 3½ times greater than that of the state's largest producer, and more than one half of all the coal produced in Illinois, Indiana and west Kentucky.[56]

The evidence from these witnesses recited the great care with which coal contracts were negotiated,[57] the playing of

[55] Central Illinois Public Service ("CIPS"), Dairyland Power Cooperative, Illinois Power Company, Electric Energy, Inc., Union Electric Company, Wisconsin Electric Power Company, Wisconsin Public Service Company, Wisconsin Power and Light Company, Central Illinois Light Company ("CILCO"), Interstate Power Company, Iowa Public Service Company and Northern States Power Company.

[56] Compare DX 85, Table XXX, A.Ex.717, with GX 72 and 85, A.Ex.91, 98. Consumption totals for Interstate Power Co. and Iowa Public Service Co. were taken from Kurtz Dep. Ex.8, pp.17, 19.

[57] See, generally, DPF 167-191, A.931-38. Gamble A.1329-30, 1343-46; Hill A.1290-91, 1309; Steele A.1263-64; Davis A.1196-97; Moser A.1385; Corey A.1404-05; Tomey A.1105-06; Wood A.1173; Ward A.547-48; Nicosin A.498-99; Redard A.569; Gaunt A.576-77, 592; Morrison A.596-97; Abrahamson A.650-51; Schotters A.636-37, 642-43; DX 150, p.51, A.Ex.1108.

one coal supplier against another,[58] the use of inter-fuel substitutability as leverage,[59] and the future likelihood of pooling of purchasing power.[60] In sum, there was no denying the fact that utilities wielded great economic power. (See, particularly, Gamble A.1343-44.) As the court noted, "the Government has conceded that utilities have at least equal bargaining power with coal producers in the midwest." (J.S. App. 27a.) The dimensions of that power were reflected in the Government's haste to point out that Commonwealth Edison, for example, did not take "unfair advantage" of midwestern coal producers. (Government's Proposed Findings of Fact, p.25.)

Producers. From the evidence, the court noted the presence in the market of a substantial number of viable coal producers, and that United Electric had found itself competing with much larger corporate enterprises which produced and sold a variety of energy sources and could thus fill all of a utility's fuel needs. (J.S. App. 18a, 40a.)

Treating Freeman-United Electric as one, the Government identified ten "leading"[61] coal producers in Illinois and the Midwest in 1967, producing a total of 63.6 and 118.3 million tons respectively. (GX 72, 85, A.Ex.91, 98.) The Government's 1967 lists, however, failed to include the names of two new entrants to Illinois and the Midwest: Humble Oil and Refining, which was constructing a deep

---

[58] Davis A.1219-20, 1225. This was admitted by the Government. GRF, p.54; DPF 188, A.937-38.

[59] Nicosin A.534; Schotters A.641.

[60] DX 232, A.Ex.1247; DX 233, A.Ex.1249; DX 257 (§ IV and Apps. A, B and C), A.Ex.1398-1405.

[61] Companies producing annually more than 300,000 tons in Illinois or more than 1,000,000 tons in the Midwest were defined by the Government as "leading" producers. See note 1 to both GX 72 and GX 85, A.Ex.91, 99.

mine in Illinois capable of producing 3 million tons a year and the 6 million ton operation being divested by Peabody.[62]

Further, it was shown that all of these "leading companies," save one, had substantially greater coal reserves than United Electric, without regard to mineability. In any event, total coal reserves held by all companies surveyed in the Midwest totalled in the billions of tons. (DX 62, A.Ex. 578.)

It was also found that the oil industry had established itself as a major element in coal production, linking under common ownership in many instances the energy resources of coal, oil, gas, uranium, oil shale and tar sands. In fact, oil companies accounted for more than 25 per cent of the coal produced in Illinois, Indiana and western Kentucky in 1967. (J.S. App. 40a.) Significantly, Freeman and United Electric had no affiliates engaged in any other fuel industry. (J.S. App. 3a-4a; GX 138.)

In light of this evidence, it is clear that the level of competition produced by the large number of viable coal producers moves without regard to United Electric's liquidating position, and United Electric is powerless to affect it.

B. The Combination of Freeman-United Electric Did Not Eliminate Actual or Potential Competition.

With respect to the Government's attempt to prove that the combination eliminated competition, the District Court observed that "[c]rucial to the Government's case is proof that United Electric and Freeman are actual or potential competitors." (J.S. App. 61a.) The court settled this factual issue against the Government.

---

[62] See Stipulated testimony of George H. Shipley (A.848), DX 84, A.Ex.640, and page 16, *supra*.

The Government relied at trial, as it does here (Gov't. Brief, pp. 11, 60-62), on a series of charts purporting to show that in 1965 through 1967, Freeman and United Electric sold coal to the same customers. (GX 88-91, A.Ex.107-17.) In rebutting this claim, defendants introduced uncontradicted documents and testimony, much of it from the very customers involved.[63] This evidence was to the effect that, with the possible exception of sales to Commonwealth Edison, none of the shipments chosen by the Government for analysis would have been competitive had Freeman and United Electric been independent. The Government's charts were totally discredited by the following evidence:

1. Shipments to four of the Government's "common customers"—Central Illinois Light Company, Illinois Power Company, Caterpillar Tractor Company and Marquette Cement Manufacturing Company—involved entirely different plants; no one facility was able to be served competitively by both Freeman and United Electric.[64] This was established by the testimony of defendants' executives and directly confirmed by the customers involved.[65] The explanation of the Chairman of the Board of Illinois Power Company is illustrative: "Because of the location of the United Electric and Freeman mines as related to the generating stations of Illinois Power Company we had not regarded the two companies as competitors with respect to

---

[63] See, generally, DPF 346-60, A.980-85.

[64] During the first part of 1965, United Electric was serving the Vermillion plant of Illinois Power Company with coal from its Mary Moore mine, 15 miles away. The mine closed earlier than anticipated, and upon the insistence of Illinois Power, Freeman shipped coal to the plant at a sacrifice in order to fulfill United Electric's contractual obligation. Once the contract ran out, Freeman ceased shipments. (Morris A.1077-78; GX 90, A.Ex.114.)

[65] Morris A.1072-74, 1077-79; Nugent A.1517-19; Davis A.1199-1200, 1204-05; DX 76, A.Ex.604; DX 230, A.Ex.1244.

service to any particular station. Freight costs prevented such competition." (DX 230, A.Ex.1244.)

2. Freeman's shipments to four other of the Government's "common customers,"—Dairyland Power Cooperative, Foote Minerals, Union Electric Company and the Meredosia Station of Central Illinois Public Service Company—were a by-product dust, which United Electric did not and could not produce; United Electric's shipments were screenings, a product not competitive with dust. Again, the testimony of defendant's executives that these shipments were non-competitive was directly confirmed by the customers involved.[88]

3. Similarly, different products were shipped by both companies to another of the Government's "common customers," Inland Steel Company. United Electric's shipments were steam coal for the generation of electricity, while Freeman shipments were metallurgical coal for making steel. (Morris A. 1078-79.) The Government has conceded that United Electric cannot compete with Freeman for the sale of metallurgical coal. (GRF, p. 8; DX 46, p. 35, A.Ex. 329.)

4. The two remaining "common customers", as shown through the testimony of the customers involved, were found to be situations where United Electric had no competitive status at all. In the case of the Tennessee Valley Authority, permission had been received to ship coal from United Electric's Fidelity mine in fulfillment of Freeman's contract with TVA during certain periods of the year when adverse river conditions closed the Fidelity mine from its natural markets. United Electric alone could not have com-

[88] See, generally, DPF 351-54, A.981-82; Morris A.1074-77; Morris A.120-21; Nugent A.1518-19; Tarzy A.258-62; Moser A.1388; Tomey A.1109-11; DX 231, A.Ex.1245.

mitted itself to TVA competitively on a long-term or even yearly basis. As the former coal purchaser for TVA explained at trial: ". . . [I]t is highly unlikely that they [United Electric] would have or could have competed with the other sources of coal . . . ."[67] Mr. Folsom, the Government's own economist, was equally straight-forward:

> "The way the thing occurred in the record, I would not say that that particular shipment represented competition." (Folsom A.1694-95.)

It was also revealed that United Electric could not sell directly to Wisconsin Public Service Company because the characteristics of its coal did not fit the design of the utility's boiler equipment. United Electric shipments were undertaken solely because Freeman had trouble fulfilling its contractual obligations in 1965 and 1966 (the only years in question), and only because the coal could be mixed with Freeman coal at a dock in Chicago in order to meet the coal specification requirements. (Morris A.1075-76; Nugent A.1518-19.) Again, it was confirmed by the Superintendent of Steam Plants for Wisconsin Public Service Company that, independently, United Electric would not be considered by his company as a potential supplier. (Morrison A.604.)

It thus remained that only one of the Government's "common customers" involved a situation where coal shipments by the two companies might have been competitive: sales to Commonwealth Edison Company. Even here, however, these sales had to be considered in light of Edison's coal requirements. Because Edison was required to purchase coal from several Freight Rate Districts in order to fulfill its needs, as the Government admitted, the competition which a given mine had to meet in bidding for Edison

[67] Hill A.1298-99. See also Hill A.1297-98; Morris A.1075; Nugent A.1518-19; Nugent A.41-42; Folsom A.1694-95; Tarry A.232-34; DX 103-04, A.Ex. 996-98.

business was that of the other mines within its Freight Rate District, rather than that of mines in other districts. (GRF, p.180; Nugent A.45-46; Tarzy A.264-66; Camicia A.85-86.)

Regardless of whether United Electric could have competed with Freeman for the business of Commonwealth Edison, it cannot be concluded that the United Electric-Freeman combination had any adverse effect on that company, as the testimony of one of Edison's top officials made clear. (Corey A.1419-21.) Edison's $2.5 billion in assets, the magnitude of its coal purchases, its commitment to nuclear energy, its readiness to use alternative fuels and its ownership of its own coal reserves and uranium resources made it totally improbable that Edison could have been adversely affected by the combination.[68]

The weight of the foregoing evidence is hardly overcome by the assertion in the Government's Brief (page 60) that United Electric and Freeman solicited the same customers. Since coal purchases are made for specific plants, rather than on a company-wide basis, solicitation of the same customers by the two companies means nothing in and of itself.[69] Nor do the testimony and exhibits referred to on the same page of the Government's Brief compel a contrary conclusion.

---

[68] See Corey A.1405-09, 1414, 1420, 1446-47; DX 90, A.Ex.866; 93-100, A.Ex.889-912; GX 135, A.Ex.126. The Government admitted that 1967 sales to Commonwealth Edison accounted for about a third of United Electric's production. Edison purchases from United Electric, on the other hand, represented scarcely a tenth of its overall coal requirements. See DPF 359 (note), A.984.

[69] The same was found to be true in *United States* v. *Crocker-Anglo Nat'l. Bank*, 277 F. Supp. 133 (N.D. Cal. 1967), where the court noted that "the fact that each of the banks had the same customers did not indicate that they were competing for the business of that customer." 277 F. Supp. at 177.

The cited testimony of Mr. Camicia (Camicia A.83-84) reflects nothing more than the data shown on the Government charts discredited at trial, and Camicia testified he knew of no other "common customers." (Camicia A.79-83.) Mr. Kolbe's testimony referred to by the Government was very general and imprecise; its implications were contradicted by John Morris, Vice President in charge of sales for United Electric and, subsequently, President. Kolbe testified Mr. Morris was far more informed than he about the marketing of coal. (Kolbe A.131-32.) Significantly, Morris testified that the "common" shipments of United Electric and Freeman could not have been competitive. (Morris A.1069-81.) Government Exhibits 93 and 94, A.Ex.118, 121 (letters from Central Illinois Public Service and Illinois Power Company) show only that Freeman and United Electric both sold coal to both companies, as explained above. Neither supports the Government's proposition, as the subsequent letters from these customers make clear. (DX 230 and DX 231, A.Ex.1244-45.) Finally, the cited testimony of Edison's Gordon Corey (A.1437) referred to the period prior to 1959 and, in any event, must be viewed in the context of Edison's bargaining position and Mr. Corey's testimony that the combination had had no adverse effect on Commonwealth Edison since that time. (Corey A.1419-20.)

The Government cites no other evidence to support its contention that there existed competition between Freeman and United Electric which had been eliminated, and there is none in this immense record. In view of all the evidence, the court was clearly correct in finding that "an independent United Electric would not and could not compete with Freeman to any substantial degree." (J.S. App. 61a.)

C. Evidence From Numerous Knowledgeable Industry Representatives Confirmed That The Freeman-United Electric Combination Has Not Led And Is Not Likely To Lead To a Substantial Lessening Of Competition.

Given the fact that the Freeman-United Electric combination was a decade old when the complaint herein was filed, the Government devoted extensive discovery efforts to the securing of opinions from both coal producers and consumers as to the effect of the combination upon them.[70] Such opinions were uniformly adverse to the Government, as was revealed in answers to interrogatories, in the depositions, and at trial.[71]

The Government admitted in its answers to defendants' interrogatories that it had "no information" as to any competitor who had been or would be "adversely affected or disadvantaged in its ability to compete" or any customer who had been or would be "deprived of actual" or "potential competition" by reason of the combination. (DX 46, pp. 8, 11, A.Ex.302-03, 305.) To the contrary, the Government interrogatory answers identified three companies which had declared that they had not and would not be adversely affected. Significantly, the only coal producer called as a witness by the Government was highly critical of the Government's efforts and objectives in the litigation. (Hopper A.1507-09.)

---

[70] See, *e.g.*, DX 46 (pp.8-9), A.Ex.302-03; DX 66, A.Ex.580; DX 73, A.Ex.599; DX 77, A.Ex.607; GX 101.

[71] See, generally, DPF 431-441, A.1005-09. This is analogous to what transpired in *United States* v. *Tidewater Marine Service, Inc.*, 284 F.Supp. 324, 340 (E.D. La. 1968): "[O]ne of the questions on the interview form used for the survey conducted by the government was whether the merger would affect the business of the firm interviewed; yet the Government was unable to introduce even one statement from a competitor indicating that the merger would have an adverse effect on his business."

The Government also admitted there was testimony in the record concerning the competitive implications of the combination from large, medium size and small public utilities, a rural electric cooperative, a federal electric authority, a retail coal dealer and several industrial concerns. (GRF, p. 225). This testimony from a broad cross-section of consumers and subjected to Government cross-examination was, without exception, supportive of the proof that the long-standing affiliation of Freeman-United Electric had not had, and was not likely to have, any adverse effect on competition.

This evidence was properly considered by the District Court. As the Government has stated in other cases, the testimony of industry experts about the actual competitive situation in the industry "is an invaluable and time honored mode of evidence in antitrust cases where the effect on competition is an issue." See *United States* v. *Pabst Brewing Co.*, 233 F. Supp. 475, 478-79 (E.D. Wis. 1964), quoting the Government's trial brief in that case.

We are mindful of this Court's admonition in *United States* v. *Philadelphia National Bank*, 374 U.S. 321, 367 (1963), that industry testimony is entitled to little weight if the witnesses fail "to give concrete reasons for their conclusions." Accordingly, it is important to demonstrate that each of these witnesses in *this case* was able to do so.

Before expressing their conclusions as to the effect upon them of the Freeman-United Electric combination, the producer and consumer witnesses testified at length concerning the factors that governed their opinions. These included the role in the marketplace played by vigorous interfuel competition;[73] the impact on coal consumption of

[73] Wood A.1188; Steele A.1265-68; Gamble A.1344-47; Davis A. 1199-1200, 1202-03; Moser A.1389-90, 1402-03; Corey A.1406-07;

the increasing concern with air pollution;[73] the important role played by transportation factors and coal quality characteristics in determining the markets that mines in any Freight Rate District are able to serve;[74] United Electric's lack of coal reserves necessary to compete for future long term utility contracts;[75] and the fact that United Electric and Freeman had long been predominantly complementary rather than competitive companies.[76]

Tomey A.1107-08, 1132; Hill A.1296-97; Morrison A.598-601, 608; Abrahamson A.663-64, 673-74; Gaunt A.587-88; Ward A.559-60; Schotters A.639-40, 643-44, 648; Nicosin A.520-22; Beck A.433; Stiehl A.542-44; King. A.410; DX 36, A.Ex.263; DX 67, A.Ex.582; DX 71, A.Ex.591; DX 72, A.Ex.594; DX 74, A.Ex.600; DX 75, A.Ex.603; DX 78, A.Ex.608; DX 90, pp.7, 9, center insert, A.Ex. 872, 874, 876-79; DX 93, A.Ex.889; DX 95-96, A.Ex.907-08; DX 99-100, A.Ex.911-12; DX 146, p.8, A.Ex. 1101; DX 147, p.13, A.Ex.1102; DX 148, p.6, A.Ex.1103; DX 149, pp.3, 12-13, A.Ex. 1104-06; DX 230, 242, A.Ex.1244, 1291.

[73] Tomey A.1130; Steele A.1267-68, 1271; Wood A.1175-76, 1190-91; Davis A.1199-1200, 1207-08; Moser A.1389-91; Corey A.1414-16; Hill A.1313; Gamble A.1350-51; Schotters A.642-43; Petersen A.368-71; Morrison A.607-08; Ward A.560; Redard A.570-71; Nicosin A.522; Beck A.433-34; Stiehl A.541-42; King A.410-11; DX 71, A.Ex.591; DX 90, center insert, A.Ex.876-79; DX 91, A.Ex.884; DX 92, A.Ex. 886; DX 97, A.Ex.909; DX 100, A.Ex. 912; DX 149, pp.3, 18, A.Ex.1104; DX 154, A.Ex.1124; DX 160, A.Ex.1138; DX 161, A.Ex.1139; DX 162, A.Ex.1141; DX 163, A.Ex.1143; DX 176, A.Ex.1158; DX 178-79, A.Ex.1160-61; DX 234, pp.6-7, A.Ex.1266-67; DX 238, A.Ex.1278; DX 239, A.Ex.1279.

[74] Wood A.1176-78, 1194; Steele A.1265-67, 1269, 1280; Moser A.1386-89, 1394-96; Tomey A.1109-12, 1128-29; Davis A.1200-02, 1204-05; Hill A.1298-99, 1301-03, 1310-11; Gaunt A.577-78, 585-87; Ward A.550-51, 555-60; Redard A.571-73; Schotters A.638-39, 643-44; Morrison A.603-05, 612; Nicosin A.518-20, 522-28, 530-32; Beck A.431-32, 444-45; Stiehl A.538-40; King A.404-05, 409; Petersen A.367-69; Nix A.419-24; DX 69, A.Ex.588; DX 74, p.3, A.Ex.602; DX 76, A.Ex.604; DX 77, A.Ex.607; DX 158, A.Ex.1136; DX 230, A.Ex.1244; DX 231, A.Ex.1245; Beck Dep.Ex.1, A.Ex.1411.

[75] Wood A.1177-79, 1191-94; Steele A.1274-75, 1278-79; Moser A.1391, 1399; Tomey A.1112-13, 1116; Davis A.1204-05, 1224-25; DX 26, A.Ex.249; DX 77, A.Ex.607.

[76] Wood A.1178-79; Davis A.1204-05, 1214-15, 1224-25; Tomey A.1124; Hill A.1297-99, 1302-03; DX 66, A.Ex.580; DX 104, A.Ex. 998; DX 105, A.Ex.999.

The Government's lone attempt to establish that these industry witnesses were indifferent to, and unsophisticated about, the competitive implications of mergers of coal producers, occurred during the cross-examination of A. H. Davis, President of Central Illinois Light Company. This elicited the fact that Mr. Davis had, in the past, taken the initiative in complaining to the Department of Justice when his evaluation led him to conclude that another merger between two coal producers *did* pose a threat to competition:

> "Q. Would you be concerned, Mr. Davis, as President of CILCO, if UEC and Freeman merged with Truax-Traer?
>
> "A. As your Department undoubtedly knows, we made a complaint several years ago about the merger of two coal companies in our area, and you have reached a satisfactory settlement, I take it, with those two companies, so anything that we feel reduces the amount of competition in our area, we are certainly not that bashful about making a complaint. If Truax-Traer were to merge with, say, Peabody in our area, we'd make another complaint.
>
> "Q. Why would that bother you, Mr. Davis?
>
> "A. It's a reduction of competition in our area." (Davis A.1222-23.)

In view of the virtual census in the record, of the very consumers on whose behalf this action was purportedly brought, regarding the effect of the Freeman-United Electric combination upon them, the trial court properly concluded that "evidence from numerous knowledgeable industry representatives, including competitors and customers of United Electric and Freeman, *confirms* the defendants' contention that the challenged combination has not led, and is not likely to lead to a substantial lessening of competition." (J.S. App. 65a.)

D. There Remains No Other Justification For the Government's Complaint.

The Government has failed to explain why it waited until 1967 to challenge an affiliation that had its inception, and was disclosed, in 1954; nor has it explained why the Antitrust Division upon receiving specific information concerning the combination in 1960 expressed no concern and took no action.[77] In the interim, no customer or competitor has come forward to support the Government's case, and a distinguished trial judge after an extensive trial has rejected it. Freeman-United Electric has been a fact of record since 1959, and the Government has failed to show in what fashion the substantial threat to competition they claim to see has become "evident." Far from threatening "to ripen into a prohibited effect," *United States* v. *duPont & Co.*, 353 U.S. 586, 597 (1957), this longstanding affiliation never has, does not now, and never can threaten competition. We suggest, therefore, that defendants should be permitted to go their way. See *United States* v. *U. S. Steel Corp.*, 251 U.S. 417, 452-53 (1920); *United States* v. *Kryptok Co.*, 11 F.2d 874, 875 (S.D.N.Y. 1925); *United States* v. *Inter-Island Steam Nav. Co.*, 87 F.Supp. 1010, 1023 (D. Haw. 1950).

The Freeman-United Electric combination is totally unlike any of the acquisitions successfully attacked by the Government years after consummation. Thus, in *duPont, supra*, the course of events during the years between the stock acquisitions and the filing of the complaint had served to *increase* the likelihood of an adverse effect on competition.[78] With Freeman-United Electric, however, the increasing interfuel competition, heightened environmental con-

[77] J.S. App. 8a. The details of this investigation are set forth in DPF 132-33, A.921-22.

[78] During this time, General Motors had increased in size and duPont's sales to GM had grown substantially, as had the "potency" of duPont's stock interest. 353 U.S. at 599, 607 n. 36.

cerns, growth of utilities, and the like, during the intervening years have made it all the clearer that the combination can have no such effect.

Similarly, in *Citizen Publishing Co.* v. *United States*, 394 U.S. 131 (1969), the two companies were in sound condition at the time of trial and their separation would restore competition where there had been none for many years. Conversely, *here* the court specifically found that in view of United Electric's inability to be a competitive factor in the future, divestiture would not benefit competition. (J.S. App. 66a.)

Apart from the Government's futile claim that United Electric and Freeman could be competitors, and the easily rebutted conclusion it would force from the structural data presented (discussed below), the Government's Brief in this Court cites no other support for its claim that the Freeman-United Electric combination has resulted in any lessening of competition during the many years of its existence.

In their post-trial papers, the Government did request a finding that the combination was likely to cause the coal industry to be less responsive to changes in consumer demands. (GPF, p. 46.) However, this finding was rejected by the trial court on the basis of ample evidence. As the court found, "the past performance of the industry suggests that there has been intensive competition among coal producers." (J.S. App. 18a.)[79] In fact, the Government conceded that it "has never asserted that during the 20 years preceding 1967, the coal industry was noncompetitive," and it also admitted that the price of coal at the mine mouth as of 1968 was actually less than it was at the begin-

[79] See, generally, DPF 138-166, A.923-30; Steiner A.792, 1582-84; Steiner Dep. Ex.2, ¶3, A.Ex.1829-30.

ning of the postwar period. (GRF, pp.39-40.) The Government also acknowledged that there had been marked improvements in coal technology and techniques, that there had been a relatively constant increase in productivity from 1947 to 1967, and that during that period the f.o.b. mine price of coal had remained relatively stable despite general inflation in wholesale prices. *Ibid.*

Given these admissions and the evidence in the record, the court was virtually compelled to conclude, as it did, that the case was "devoid of any signs of anticompetitive performance." (J.S. App. 18a.)

II.

THE DISTRICT COURT COMMITTED NO ERROR IN DECLINING TO DECIDE THE CASE SOLELY UPON THE STRUCTURAL DATA SUBMITTED BY THE GOVERNMENT.

In the absence of any ground for challenging the documented *factual* findings of the trial court, the Government struggles to find a *legal* issue in regard to the subsidiary questions of market definition, asserting error in the refusal of the District Court to dispose of the case solely on the basis of the Government's structural data. The failure of the Government's case, however, was that it could not show an adverse competitive effect in *any* line of commerce in *any* section of the country—the trial court specifically holding in this regard that there would be no Section 7 violation "even were this court to accept the Government's unrealistic product and geographic market definitions." (J.S. App. 66a; see also J.S. App. 59a-60a.) Thus, the outcome below would have been no different had the market definition questions been resolved in the way the Government wished. In any event, the District Court properly analyzed the markets in-

volved and properly rejected the Government's structural data as controlling of the outcome of the case.

A. The Decision Below Did Not Turn On The Subsidiary Questions of Market Definition.

As is clear from its opinion, the District Court's resolution of the subsidiary questions of market definition were not controlling of the ultimate issues in this case. Therefore, the questions raised by the Government concerning the court's choice of product and geographic markets are not material.

This Court has made it clear that in an action under Section 7, an "examination of the particular market—its structure, history and probable future" is necessary to "provide the appropriate setting for judging the probable anti-competitive effect of the merger." *Brown Shoe Co.* v. *United States,* 370 U.S. 294, 322 n. 38 (1962). It was on the basis of precisely such an examination, involving a careful assessment of *"all* of the evidence" (J.S. App. 2a, 18a, 53a, 64a, 66a), that the District Court concluded that the challenged combination did not offend Section 7.

Significantly, not one of the many factors considered by the court in reaching its decision hinged upon resolution of the questions of market definition. These questions were thus in no sense critical to the outcome, and the court specifically held that the United Electric-Freeman affiliation would not violate Section 7 "even were this court to accept the Government's unrealistic product and geographic market definitions." (J.S. App. 66a; see also J.S. App. 59a-60a.) In so holding, the court acknowledged (J.S. App. 60a) this Court's teaching in *Pabst* that questions of market definition are "entirely subsidiary to the *crucial question* in this and every § 7 case which is whether a merger may

substantially lessen competition. . . ." *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, 549-50 (1966).

It is important to recognize that the District Court did not use the relevant product and geographic markets which it adopted as the key to the denominator for a simplistic mathematical test. To the contrary, it rejected a mechanistic approach and focused instead on the "crucial question" of the combination's competitive effects.

Accordingly, the trial court's choice of energy rather than coal as the appropriate *product* market *was not* the predicate for a finding that the challenged combination supplied an insubstantial share of energy resources consumed in the Midwest. It was designed instead to make it clear that the court had given full recognition to the intense competitive pressures from alternative fuels which, the court concluded on the basis of substantial evidence (see J.S. App. 27a-53a), were "crucially relevant to its assessment of the competitive effect of the United Electric-Freeman combination." (J.S. App. 53a.)

Neither was the District Court's *geographic* market definition a prelude to an exculpating finding of permissible market share. Rather, it was intended to facilitate an identification of areas or customers to scrutinize for the alleged anticompetitive effect (J.S. App. 57a), and to facilitate an understanding of why the Government's market share statistics were not a reliable guide to determining the level of competition in the industry. (J.S. App. 57a-60a; 62a; 65a-66a.)

Thus, as the Government itself recognizes (Gov't. Brief, p. 33 n. 21), the court's product and geographic markets were chosen not to foreclose examination of the *coal* industry in the *Midwest*, but rather because they helped to "explain a great deal of what has happened in the *coal* industry and to

its markets." (J.S. App. 52a-53a; see also J.S. App. 57a-59a.) Conversely, what the Government would have is a market definition operating as an exclusionary rule of evidence. They would ask the trial court to blind itself to factors outside the coal industry that very definitely affect the level of competition within it; and they would seek protection of their market share statistics from analysis that might show them to be misleading or meaningless.[80]

In any event, whether it is technically correct to designate the relevant product market energy or coal, there can be no escaping the hard facts of record with respect to the "crucially relevant" pressures on coal producers such as United Electric-Freeman arising from the vigorous interfuel competition existing in the marketplace, the bargaining power that such competition gives consumers, and the impact of environmental controls on coal's rivalry with other fuels.

The same is true of the geographic markets adopted by the court: whether United Electric and Freeman are said to serve different areas within a market or different markets, "viewed in the context of all the evidence in this case . . . an independent United Electric would not and could not compete with Freeman to any substantial degree." (J.S. App. 61a.) This finds parallel in *United States* v. *Crocker-Anglo Nat'l Bank*, 277 F.Supp. 133 (N.D. Cal. 1967) where

[80] The approach followed by the court below finds parallel in *Kennecott Copper Corp.* v. *FTC*, 467 F.2d 67, 71 (10th Cir. 1972) ("it seems reasonable to consider . . . the competition that exists between coal and other fuels"); *United States* v. *Connecticut Nat'l Bank*, 5 Trade Reg. Rep. (1973 Trade Cas.) ¶74,577 at 94,546 (D. Conn. 1973) ("influences of the New York banks require serious consideration and analysis when the Court considers the remaining crucial issues in the case, i.e., the impact of the merger on competition"); and *United States* v. *First Nat'l Bank of Md.*, 310 F.Supp. 157, 168 (D. Md. 1970) ("non-commercial bank activities can be taken into account in connection with the effect of the merger upon commercial banking as the line of commerce in the given market").

the court rejected the contention that there was a statewide banking market but found that, even if there were, there was no Section 7 violation in light of the insubstantial competitive overlap between the merging companies. 277 F.Supp. at 169-73, 177-78.

The court's own discussion of the likely competitive effects of the combination (J.S. App. 60a-64a) makes clear that *none* of its findings with respect to concentration, competitive overlap, types of mining, types of coal, Commonwealth Edison, United Electric's inability to serve Chicago, United Electric's "singularly unpromising" coal reserve prospects and the like were dependent upon the market definitions chosen by the court or would have been different had the markets urged by the Government been adopted.[81]

In light of the economic and commercial realities found to exist by the trial court on the basis of substantial evidence, it is clear that the decision below would have been no different had the subsidiary technicalities of market definition been resolved according to the Government's wishes. The assertions by the Government that the Court's opinion "reflects no analysis of the structure of the coal submarket or of the impact upon it of the Freeman-United Electric combination" and "no discussion of the effect of the combination on competition within the sections of the country proposed by the Government" (Gov't. Brief, pp. 32 n.20, 50 n.36) are flatly wrong. The entire opinion constitutes precisely such an "analysis" and "discussion." Accordingly,

---

[81] In *Brown Shoe*, *supra*, this Court declined to consider whether the District Court had been correct in rejecting certain proposed market definitions where such markets, even if proper, would not "aid us in analyzing the effects of this merger" and where the appellant could "point to no advantage it would enjoy" even if the markets in question were used in lieu of those employed by the district court. 370 U.S. at 327.

while defendants submit that the court's rulings on market definition were correct, it is clear that even if the markets had been defined as the Government asked, the outcome would have been the same.

B. The District Court Correctly Rejected The Market Definitions Urged By The Government.

The Product Market. There was nothing either factually or legally novel in the District Court's examination of the likely competitive effects of the United Electric-Freeman merger within the framework of an energy market. Indeed, the Federal Trade Commission recently sent to Congress a report by its Bureau of Economics on interfuel substitutability (focusing largely on utility consumers) which finds that the results of its study support the conclusion that "an energy market exists." FEDERAL TRADE COMMISSION STAFF REPORT, INTERFUEL SUBTITUTABILITY IN THE ELECTRIC UTILITY SECTOR OF THE U.S. ECONOMY 115 (1972). The purpose of the report was to analyze the extent of interfuel substitution "in order to establish the product boundaries between the various energy sources." *Id.* at 2. In doing so, it confirmed that coal, gas and nuclear energy trade in a "single market," and that "the primary fuels are generally good substitutes for one another." *Id.* at 115-16.

In his dissenting opinion in the Court of Appeals stage in the *Tampa Electric* litigation, Judge Weick was similarly persuaded that:

> "there exists such a degree of cross-elasticity between coal and other boiler fuels as to constitute boiler fuels the relevant line of commerce in this case. Each of the boiler fuels—coal, oil, gas and atomic energy—is utilized in the same manner to produce the same result.

> As each is consumed power is produced to drive the generators which in turn produce electric energy."[82]

Numerous other cases have recognized the reality of interfuel competition. See, *e.g.*, *Federal Power Commission* v. *Hope Natural Gas Co.*, 320 U.S. 591 (1944); *Fuels Research Council, Inc.* v. *Federal Power Commission*, 374 F. 2d 842, 845, 850, 852-54 (7th Cir. 1967); *National Coal Association* v. *Federal Power Commission*, 247 F.2d 86 (D.C. Cir. 1957); *Mississippi River Transmission Corp. and United Gas Pipe Line Co.*, 41 FPC 555 (1969); *Natural Gas Pipeline Co. of America* v. *New York Central RR. Co.*, 323 ICC 75 (1964); and *Natural Gas Pipeline Co. of America*, 28 FPC 731 (1962).

Similarly, in this case, the District Court determined the "competitive battle waged by various forms of energy" to have been "documented in this litigation." (J.S. App. 55a.) Coal was found to have the same uses as the alternative fuels with which it competes (J.S. App. 27a), the same customers (J.S. App. 29a-40a), a high degree of sensitivity to price changes of other fuels (J.S. App. 13a, 28a-29a, 36a-39a, 43a-44a, 51a-52a), and was viewed as an integral part of the energy market by the public, industry, and Government itself. (J.S. App. 13a-14a, 29a, 31a-32a.)

To combat these commercial realities, the Government catalogues the differences between coal and other forms of energy. (Gov't. Brief, pp. 21-31.) To be sure, there are coal trade associations, labor unions, and publications; admittedly, coal looks different from gas, oil and uranium and is mined and prepared in a different way. But the fact that an

---

[82] *Tampa Electric Co.* v. *Nashville Coal Co.*, 276 F.2d 766, 780 (6th Cir. 1960), *rev'd*, 365 U.S. 320 (1961). In its reversal of the majority opinion, this Court found it unnecessary to decide whether boiler fuels, rather than coal alone, was the appropriate line of commerce. 365 U.S. at 328-30. But see *Brown Shoe Co.* v. *United States*, 379 U.S. 294, 330 (1962).

oil derrick is of no use in a coal mine, or that coal is black and uranium yellow, are all distinctions without a difference and contribute nothing to the determination of whether there is interfuel competition.[83] And the statement that "[c]oal's dominance . . . is not likely to disappear soon" (Gov't. Brief, p. 27) means nothing more than that the competitive battle among various forms of energy is not yet over.

While the Government's Brief adopts an essentially mechanical approach to the considerations suggested in *Brown Shoe*[84] for determining submarkets, the cases make clear that in determining the appropriate line of commerce, legalisms are no substitute for examination of the economic and commercial realities involved. The opinion in *Brown Shoe* itself notes that "Congress prescribed a pragmatic, factual approach to the definition of the relevant market and not a formal legalistic one." 370 U.S. at 336. This Court has also pointed out with reference to *Brown Shoe* that:

> "Concededly, these guidelines offer no precise formula for judgment and they necessitate rather than avoid, careful consideration based upon the entire record." *United States* v. *Continental Can Co.*, 378 U.S. 441, 449 (1964).

Both before and after *Brown Shoe* the cases acknowledge the principle that "the boundaries of the relevant market

---

[83] As far as price differences in raw fuel are concerned, the trial court recognized that, "the choice between competing fuels depends not only on delivered price, but on such matters as relative thermal efficiencies and differences in capital costs of burning equipment as well. The costs of storing, handling, and in some instances, disposing of the fuel by-products or residue, for example, are economic factors which can make a low-cost fuel the most expensive fuel . . . . In some areas, operating considerations, such as air pollution control regulations, may require a premium priced fuel and foreclose consideration of others." (J.S. App. 28a-29a.)

[84] *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 325 (1962).

must be drawn with sufficient breadth . . . to recognize competition where, in fact, competition exists." 370 U.S. at 326. See *United States* v. *Continental Can Co.*, 378 U.S. 441, 457 (1964); *United States* v. *duPont & Co.*, 351 U.S. 377, 404 (1956); *United States* v. *Connecticut Nat'l Bank, supra* note 80, ¶74,577 at 94,544; *United States* v. *Columbia Pictures Corp.*, 189 F.Supp. 153, 185 (S.D.N.Y. 1960).[85]

The Government would fault the District Court's reading of *United States* v. *Continental Can Co.*, 378 U.S. 441 (1964). (Gov't. Brief, pp. 33-35.) Chief Judge Robson, however, construed the decision (which involved only whether the Government had made out a *prima facie* case) in precisely the same manner as Justice Goldberg in his concurring opinion. That is to say, that the relevant product market was a *question of fact* in each case, and that "upon remand it will be open to the defendants not only to rebut the *prima facie* inference that metal and glass containers may be considered together as a line of commerce but also to prove that plastic or other containers in fact compete with metal and glass to such an extent that as a matter of 'competitive reality' they must be considered as part of the determinative line of commerce." 378 U.S. at 466.

What the Government really despairs of, however, is not that the District Court adopted the wrong line of commerce, but that it did not decide the "crucial" question in the litigation solely on improperly aggregated coal production statistics. As is discussed below, the court properly refused to do so and declined to view the case as a numbers game. If, for example, the Court's conclusion had focused

[85] The decision in *United States* v. *Aluminum Co. of America*, 377 U.S. 271 (1964) announces no different rule. Insulated aluminum conductor was found to be a submarket because there was not a sufficient degree of competitiveness between that product and insulated copper conductor. 377 U.S. at 276-77.

on defendant's *de minimus* share of energy markets, the Government's quarrel with the trial court's product market might have some substance. Since, however, that was decidedly not the rationale below, the Government's arguments on the line of commerce issue, and the issue itself, have no significance.

The Geographic Markets. Upon the issue of the relevant geographic market, there is and was no dispute among the parties concerning the proper legal standard: appropriate sections of the country must "correspond to the commercial realities of the industry and be economically significant." *Brown Shoe Co.* v. *United States, supra,* 370 U.S. at 336-37.[86] But while the Government claims that each of the two geographic markets it proposed "corresponds to the competitive realities of the coal industry" (Gov't. Brief, p. 37), the trial court properly decided this factual issue against them:

> "The Government's proposed geographic markets, Illinois and the Eastern Interior Coal Province, are based essentially on past and present production statistics and do not relate to actual coal consumption patterns. The Government failed to produce evidence to establish the existence of a market for coal within these two proffered geographic areas." (J.S. App. 56a.)

The evidence overwhelmingly supported these findings.[87]

---

[86] Accord: *Case-Swayne Co.* v. *Sunkist Growers, Inc.*, 369 F.2d 449, 456 (9th Cir. 1966), *rev'd on other grounds*, 389 U.S. 384 (1967); *United States* v. *Connecticut Nat'l Bank, supra,* ¶74,577 at 94,544; *United States* v. *Northwest Industries, Inc.*, 301 F.Supp. 1066, 1083-84 (N.D. Ill. 1969); *United States* v. *Tidewater Marine Service, Inc.*, 284 F.Supp. 324, 332 (E.D. La. 1968); *United States* v. *Crocker-Anglo National Bank*, 277 F.Supp. 133, 173 (N.D. Cal. 1967); and *United States* v. *Kimberly-Clark Corp.*, 264 F.Supp. 439, 457 (N.D. Cal. 1967).

[87] Significantly, the Government's Brief is searched in vain for a claim that either Illinois or the so-called Province sales area is a

The Government's failure to prove the existence of either an Illinois or an "Eastern Interior Coal Province sales area" market for coal was mainly at the hands of its own trial economist, James Folsom. On direct examination, under cross-examination, and when questioned by the court, Mr. Folsom confessed he had "problems" with the Government's suggestion of the "Province sales area" as a market—principally because of its failure to take account of the important role which transportation costs play in determining where coal from any given mine can be sold. He could also not explain why certain areas had been included within the "Province sales area" and others excluded. (Folsom A.1689-90, 1701, 1711-12.) The following examination of Mr. Folsom by Government counsel is illustrative:

> "Q. I hand you what has been received into evidence as Government's Exhibit 52, which is a chart entitled "1967 Sales of Coal in the Eastern Interior Coal Province Sales Area by Coal Producers Located in Illinois, Producing District No. 10; Indiana, Producing District No. 11; and Western Kentucky, Producing District No. 9."
>
> "I ask you to examine this exhibit, sir, and on the basis of the exhibit to tell us your opinion as to the validity of the Government's choice of the Eastern Interior Coal Province sales area as one of the relevant economic markets in this lawsuit."
>
> "A. *I do not believe that this exhibit will stand alone*—I do not believe standing alone it will justify seeing the Eastern Interior Coal Province Sales Area

"market". The Government does observe that the province constitutes a "*producing* area," that *production* figures are published for the province, that the "region is geologically united, and underlain by a coal-bearing sequence of rock," and that "Illinois has more coal resources than any other State." (Gov't. Brief, p. 38-39 and n. 22.) However, these factors hardly bear on the question of whether these areas constitute *markets*.

> as a market. It gives you some basis for this, in that the percentages of production sold within the area, production by the companies in the Eastern Interior Coal Province, is fairly substantial in terms of their sales within the area; *but you have to have the testimony from the people about the fact that they buy coal all over this area, et cetera, to justify saying this is an economic market.*" (Folsom A.1711-12.)

There was, of course, no such testimony and the court so found. (J.S. App. 65a.)[88]

Similarly, there was no evidence supporting the existence of an Illinois market for coal and the Government admitted that no industry witnesses testified to its existence. (GRF, p.188.) As the court observed (J.S. App. 56a), while Mr. Folsom had "concluded that the State of Illinois was the most appropriate market" (Folsom A.1689-90), he never explained why and could name no factor that made the state's political boundaries a meaningful measure of the relevant geographic market for coal. (*Id.* at 1697-98.)[89] Defendants did show, however, that use of Illinois as a market was particularly inappropriate since 70 percent of Freeman's Southern Illinois production was shipped out of state, and, excluding shipments to Edison, less than 38 percent of its *total* 1967 production was shipped to consumers in Illinois. *Freeman Response To Government Questionnaire.*[90]

---

[88] This presents a factual situation identical to that in *United States* v. *Crocker-Anglo Nat'l. Bank*, 277 F.Supp. 133, 170 (N.D. Calif. 1967) where the Court noted that the Government could not identify any customer in a state-wide banking market.

[89] Mr. Folsom also testified that using the Mississippi and/or Ohio Rivers (which also define the boundaries of Illinois) made no sense as dividing lines in determining a coal market. Tr. 2538-39.

[90] Indeed, even the Bureau of Mines economist who prepared the statistics used by the Government recognized that the market areas in which coal can be sold are determined by Freight Rate Districts and not by state boundaries. He testified that his statistics did not

The Government's consumption statistics with respect to Illinois and the "Province sales area" (Gov't. Brief, pp. 39, 40) also failed to support the claim that these were markets. The fact that 82 percent of the coal consumed in Illinois is produced in Illinois no more demonstrates that it is a market than the fact that 100 percent of the coal sold in the western hemisphere is produced there indicates that there is a western hemisphere coal market. While such data may indicate that the market is no larger than the area in question, it plainly provides no insight as to whether the area is itself a market.[91]

The Government does not, because it cannot, effectively deal with the fact that its proposed markets have no relation to the "actual coal consumption patterns" that are dictated by considerations of transportation cost. (J.S. App. 56a-57a.) Coal is, of course, a transportation intensive commodity. This Court has long been aware that "[a] difference of a few cents per ton in the transportation charge is normally sufficient to divert a coal contract from one mine to another." *Ayrshire Collieries Corp.* v. *United States,* 335 U.S. 573, 586 (1949). It is not surprising, then, that the District Court found the "evidence clearly indicates that transportation costs largely determine those facilities for whose business coal mines are able to compete and those

---

deal with specific markets and conceded that "anyone with even a minimum amount of knowledge of the coal industry" knows that consumers in the Fulton-Peoria area, for example, cannot be sold coal from Southern Illinois on a competitive basis. (Gallagher A. 320-22.)

[91] The shortcoming of the Government's market delineation procedure in drafting its complaint was simply that it was incomplete. Had the Government carried its own technique one step further, it would have found, as did the trial court, that the ICC-designated Freight Rate Districts in which the mines of United Electric and Freeman were located serve "separate and distinct" marketing areas. (J.S. App. 57a-59a, 62a.)

mines to which coal consumers can practicably turn for supplies." (J.S. App. 57a; see also J.S. App. 19a-20a.)[92]

Finally, the Government's argument that "there may be more than one relevant section of the country" (Gov't. Brief, p. 44) avails it nothing. Other relevant geographic markets, if there are any, still have to correspond to "commercial realities" and those urged by the Government did not. As the court observed, "[r]esponses to the subpoena questionnaire [which the District Court had ordered] sent to midwest coal consumers demonstrated that each Freight Rate District serves a distinct and definable area, as did the testimony of producers and consumers." (J.S. App. 57a.) This evidence showed that distribution patterns of coal were dictated not by political boundaries, but by transportation costs, coal quality characteristics[92a] and Freight Rate Districts. (J.S. App. 57a; Steiner A.1602-15; see, generally, DPF 283-88, A.963-65; DPF 309-45, A.970-79.)

The Government's attempt to obfuscate the "commercial realities" of actual coal distribution patterns fails. First,

---

[92] The Government's reliance (Gov't. Brief, p. 43) on *Tampa Electric Co.* v. *Nashville Coal Co.*, 365 U.S. 320 (1961), is misplaced. The fact that coal producers in a number of states might effectively compete for the business of a customer located in Florida—far removed from any coal production and thus offering no significant shipping cost advantage to producers in a single area—has absolutely no bearing on the question whether a coal producer located in one Illinois Freight Rate District can successfully compete with a producer in another Illinois Freight Rate District for customers whose location gives the latter producer a very substantial shipping cost advantage. In the present case, involving just such cost advantages, the trial court found that disadvantaged producers could not compete.

[92a] The simple fact is that coal is not, as the Government urged below, a fungible commodity which can be sold anywhere. Coal varies considerably in such characteristics as sulphur content, ash content, moisture content, ash softening temperature, BTU rating and the like. Because boiler equipment is custom-designed, such characteristics are among the important factors which determine from which mines a consumer can practicably buy coal. See gen-

such patterns are not based on rail rates alone (Gov't. Brief, pp. 45-46), but upon all relevant costs, as the opinion and evidence demonstrate. The fact that defendants' markets were not "contiguous" (Gov't. Brief, pp. 47) is of no consequence; we are aware of no legal or economic theory, and none is cited, that holds that markets must be "contiguous" if there are more than one. Further, the claim that defendants' markets were based on only one year's sales data (Gov't. Brief, p. 48) overlooks the facts that (1) the markets revealed were supported by the testimony of consumers and producers;[93] (2) the markets were also tested against sales data collected by the Government;[94] (3) the purchase of coal under long-term contracts, as well as the rigidity of transportation rates, tends to "fix" distribution patterns for years;[95] and (4) since sales data for 1965

---

erally, DPF 289-96, A.965-67. While the Government advised the trial court that "[o]ur position is that coal is coal . . .", it can only have been embarrassed when one of its own employees readily conceded during deposition that the Government itself would never "order coal without regard to its characteristics." (Compare Transcript of Pre-trial Conference of February 19, 1969, p.6 with Nix A.423-24.) Indeed, the Government's official solicitation form for coal bids specifically provides that whenever the offered coal is not in conformance with specifications it "shall be rejected as being non-responsive." (Burton Dep.Ex.1, p.6, A.Ex.1413.)

[93] Davis A.1199-1202, 1205; Sherwood A.1375; Moser A.1386, 1389, 1394; Wood A.1176-78; Tomey A.1110-12; Steele A.1266-67, 1280; Tarzy A.271-72; Hill A.1298-99, 1303, 1306; Morris A.1072-74, 1079, 1151-53; Nugent A.1517-19; Redard A.570-73; King A.403-04, 409; Beck A.431-32; Morrison A.602-04, 606-07; Abrahamson A.652-55; Petersen A.367-69, 374-75, 377-78; Nicosin A.527-28; Tarzy A.256-57, 270-71.

[94] The Government sent a questionnaire to virtually every Midwest coal producer seeking information as to the destination of all coal shipments for 1965, 1966 and 1967. Defendants checked their analysis of markets against this sales data collected by the Government for 1967. The results were essentially identical. Compare DX 55 with DX 56, A.Ex.462, 481.

[95] To illustrate, DX 57, A.Ex.506, is a chart prepared in *1960* showing utility use of coal in that year according to Freight Rate

and 1966 were available to the Government, they could easily have shown 1967 data to be unreliable if that had been the case.[96]

Finally, the Government attempts to disparage these actual coal distribution patterns by calling them a "patchwork" and a "crazy-quilt" and claiming that, while they are "purportedly" based on actual areas served, they "do not reflect the way coal is marketed." (Gov't. Brief, pp. 44, 45, 47.) This overlooks that (1) these patterns are based on the responses of virtually every significant consumer of coal in the Midwest to a subpoena questionnaire issued by the District Court in a form agreed to by the Government, and (2) the accuracy of all of this data was *stipulated* in advance of trial, including the fact that "[i]n 1967, approximately 97 percent of the production in the Fulton-Peoria Freight Rate District, 100 percent of the production in the Springfield Freight Rate District and 98 percent of the production in the Belleville Freight Rate District and 85 percent of the production in the Southern Illinois Freight Rate District, was shipped to one or more of [these]market areas . . . ." (DX 49(a), A.Ex.345; DPF 316-20, 323-27, 330-34, 337-42, A.972-78.)

In any event, the trial court's finding that "[t]he Freight Rate Districts in which the mines and reserves of United Electric are located serve separate and distinct markets from those in which the mines of Freeman are located" (J.S. App. 62a) was addressed not so much to the subsidiary legal question of the appropriate "section of the country," but to what the facts of record showed with respect to the marketing of coal. Whether it is technically correct to say that United Electric and Freeman serve separate

districts. The pattern shown in that year is virtually identical to that revealed by defendants for *1967*.

[96] See note 94, *supra*, and DPF 47-48, A.899.

markets within a "section of the country" or to say that they serve separate "sections of the country," there can be no denying that "United Electric would not and could not compete with Freeman to any substantial degree." (J.S. App. 61a.)[***]

C. The Government's Structural Data Was Not A Fair Measure Of The Competitive Impact Of The Combination.

In their post trial brief at page 8, the Government asserted that "the chief function of the market delineation is to identify an area within which sales percentages can be relied upon for substantial guidance in measuring the impact of the merger on competition." Under the factual circumstances in this case, however, and consistent with prior decisions of this Court, the District Court very properly rejected the Government's simplistic structural approach.

At the outset, it should be observed that by repeatedly referring to the question of the establishment of a *prima facie* case in connection with its structural data (Gov't. Brief, pp. 17, 51, 52, 53, 57, 58, 64), the Government confuses the true posture of the case before this Court. Unlike *United States* v. *Continental Can Co.*, 378 U.S. 441 (1964), and *United States* v. *Pabst Brewing Co.*, 384 U.S. 546 (1966), the District Court below did not dismiss the complaint at the close of the Government's case on the ground that it had failed to carry its initial burden of proof. In contrast, the question for review here is whether the findings of the court below, after a full trial, are "clearly erroneous." *United States* v. *du Pont & Co.*, 351 U.S. 377, 381 (1956); *United States* v. *Yellow Cab Co.*, 338 U.S. 338, 342 (1949); Fed. R. Civ. P. 52(a). The Government's seeming unwillingness to

[***] See again, *United States* v. *Crocker-Anglo Nat'l Bank*, 277 F.Supp. 133, 169-73, 177-78 (N.D. Cal. 1967) (discussed at pages 51-52, *supra*).

address itself to this question—while perhaps understandable in view of the comprehensiveness of the record and the District Court's conscientious analysis of it—cannot alter that fact.

Nor is this case like *United States* v. *Philadelphia National Bank*, 374 U.S. 321, 366 (1963), where this Court found "nothing in the record . . . to rebut the inherently anti-competitive tendency" of the merger. After two years of pre-trial discovery and a month-long trial, creating a record that included more than 10,000 pages of exhibits and more than 7,500 pages of testimony, the trial court had more than ample support for its conclusion that the Government's structural case could not be sustained.

In addition to the weakened significance of the Government's structural data brought about by aggregating such statistics in "economically unrealistic markets," (J.S. App. 65a)[96b] other key factors interdicted use of such data as an accurate measure of the competitive impact of the combination in *any* line of commerce, in *any* section of the country. These were as follows:

1. The most significant deficiency in the Government's statistical case was the total disregard of the "key factor in a coal producer's market strength—coal reserves." (J.S. App. 65a.) As we have discussed above, the level of verifiable, substantial and uncommitted coal reserves is vastly more determinative of a supplier's ability to compete than past or current production levels. An analysis of the market that takes no note, on the one hand, of United Electric's enfeebled reserve position and, on the other, of Humble's competitive importance after acquiring more than 3 billion tons of deep reserves in Illinois, just cannot be considered

---

[96b] In addition, while the Government concedes that metallurgical coal and steam coal do not compete (GRF, p.8; DX 46, p.35, A.Ex.329), its production statistics do not reflect this.

a full and accurate measure of competition in any market. The Government's statistics ignore Humble simply because it hadn't yet started production.

2. The Government's structural data was also deficient in that it failed to take into account the nature of the customers for whose business coal companies compete. Where, as here, the customers in a given market are technologically sophisticated, make it standard practice to buy only after careful investigation of the sellers, and possess the formidable bargaining power of the large-scale, long-term purchaser, production data simply cannot accurately reflect the competitive strength of the sellers in the market. Undeniably, the freedom of action possessed by sellers in such a market is totally different from that existing in a market of powerful sellers and small, weak purchasers.

The instant case thus contrasts sharply with those previously before this Court involving seller-dominated industries and markets in which the consumer wielded virtually no power. *United States* v. *Von's Grocery Co.*, 384 U.S. 270 (1966) involved the retail grocery market; *United States* v. *Pabst Brewing Co.*, 384 U.S. 546 (1966) concerned the beer market; and in *United States* v. *Philadelphia National Bank*, 374 U.S. 321, 369-370 (1963), this Court was concerned with the small businessman's lack of power in the commercial banking market. In the markets in which the defendants in the present case compete, on the other hand, tremendous power is wielded by customers.

3. The Government's production statistics suffered from the further deficiency of ignoring the pervasive changes that have occurred in the coal industry over the past quarter century. As the trial court stated in the course of its in-depth analysis:

> "The effect of the changes since World War II in the patterns of coal consumption and marketing, in labor costs, in mining technology, in productivity, in coal preparation procedures and in transportation costs has been to enhance the economies of scale production and to greatly increase capital requirements. This, in turn, has led to an increase in the size of mines." (J.S. App. 16a.)
>
> "[T]he innovations in the coal industry that have made coal prices competitive with other forms of energy have created the need for large scale production and, thus, for large companies. Experts for both the Government and the defendants agreed that under these circumstances, increase in the size of coal mining companies and the concentration of more production in fewer mines, as well as more output of a given mine devoted to a particular source, have been economically inevitable." (J.S. App. 24a.)

In recent years, the coal industry has lost to other fuels its transportation market, its spaceheating market, and its dominant position in the industrial markets; the utility market has emerged as the principal market for coal. (J.S. App. 11a-12a.) As we have discussed above, in order to compete successfully for utility customers under the long-term contractual arrangement that is now generally required, successful coal producers have necessarily grown in size.

Both the defendants' and the Government's economic experts agreed that it was the disappearance of domestic and railroad markets, as a direct result of interfuel competition, coupled with the rise of long-term contracts, that was responsible for the withdrawal and disappearance of smaller coal producers. (Steiner A.1576, 1619-20; Folsom A.1706.) As the court found, from the testimony of a number of witnesses, "small producers are, for all practical pur-

poses, in a 'different business.'" (J.S. App. 17a and n.18; see, generally, DPF 159-64, A.928-30.)

Moreover, the evidence showed that apart from the activities of Peabody Coal Company there was no trend toward concentration. It was seen that, excluding Peabody, the production shares of the two, four, and ten largest producers had, since 1959, remained stable or declined,[97] and that the United Electric-Freeman combination "accounted for less of the coal produced in Illinois and the three-state area in 1967 than it did in 1959." (J.S.App. 60a.) Whether or not the Government is correct in its assertion that "the effects of an increasingly concentrated market structure are not mitigated merely because the increases are caused chiefly by a single company" (Gov't. Brief p. 56), the assertion is irrelevent; the Government's consent decree with that single company (Peabody) has cured and nullified those effects to the Government's satisfaction. As for the future, deconcentration will continue as Humble Oil opens a mine with an output of 3 million tons per year and Peabody divests itself of an operation annually producing 6 million tons. Furthermore, the Government will surely prosecute and prevent any truly anticompetitive coal or interfuel merger.

4. Finally, the inadequacy of the Government's structural approach to the case at bar was further demonstrated by the Government's action during the negotiating of the consent decree in the *Peabody* case. The Antitrust Division went on record there (DX 37, A.Ex.264) that it would approve "without reservation" a merger of the Midland operation (which Peabody had consented to sell) and Zeigler Coal and Coke Company. This combination would have been structurally indistinguishable from United Electric-Freeman, with the resulting combination in either situation constitut-

[97] GX 64, A.Ex.83; GX 72, A.Ex.91; GX 77, A.Ex.96; GX 85, A.Ex.98; DX 237, A.Ex.1274; Steiner A.1615-21.

ing the second largest coal producer in Illinois and the Midwest. The Government's willingness to approve a Zeigler-Midland merger "without reservation" casts doubt on both the seriousness and the substance of its contention that anti-competitive effects will follow from a continuation of the United Electric-Freeman affiliation. Significantly, when he was asked to make a competitive assessment of Zeigler-Midland following a simplistic structural approach, the Government's economist at trial balked, stating, "I would still want more information. I would still want to look further." (Folsom A.1709).[98]

In view of all the evidence, the trial court very properly concluded that "continuation of the affiliation between United Electric and Freeman is not adverse to competition, nor would divestiture benefit competition even were this court to accept the Government's unrealistic product and geographic market definitions." (J.S. App. 65a-66a.)

III.

THE FOURTH QUESTION PRESENTED BY THE GOVERNMENT IS UNTIMELY, INCONSISTENT AND WITHOUT MERIT.

The argument developed by the Government under its fourth Question Presented (Gov't. Brief, pp. 2, 19-20, 63-

[98] As we pointed out in the Motion to Affirm, the Government cannot satisfactorily explain its inconsistent and irreconcilable actions. We have here not a case where the Government has merely taken no action on the one hand, while bringing suit on the other. Rather, it is a unique situation where the Antitrust Division has taken *affirmative* and contradictory action with respect to structurally identical mergers, approving the creation of one "without reservation" while simultaneously seeking to dissolve another that has existed for more than a decade. Recognizing the questionable nature of such action, the Chief of the Antitrust Division's Chicago office has stated on the record that he has "some sympathy with the defendants [United Electric-Freeman] in the Zeigler (cont.)

74) raises the claim that the District Court erred in not invoking this Court's teachings with respect to the "failing company" defense.[99] Preliminarily, it should be observed that the Government's apparent full retreat from its earlier request for an examination of the evidentiary support for the District Court's conclusions regarding United Electric's future, and a determination whether United Electric's potential had been "cut off" in 1959, speaks convincingly to what the trial record shows on those issues. (J.S. Questions 3 and 4 and pp. 20-24; Gov't. Brief, p. 2 n.1.)

As for the late-arriving claim that the District Court viewed United Electric's competitive viability under erroneous legal standards and at the wrong point in time, this is a contrived afterthought at odds not only with the record but with the Government's own position throughout the six years of this litigation. Indeed, all that the Government's new argument demonstrates is the desperate nature of its attempt to find *some* means, however strained and bizarre, to avoid the overwhelming record evidence showing that the challenged combination does not run afoul of Section 7.

The Government's naked assertions (Gov't. Brief, pp. 20, 70-74) that there is a deficiency in the record with respect to United Electric's condition and prospects in 1959 and 1967 are nonsense.[100] The Government's suggestion (without

---

matter." (Transcript of Pre-trial conference of October 3, 1969, p. 10, A.872.) The Zeigler-Midland affair is discussed in detail in Defendants' Proposed Findings 449-56, A.1011-14.

[99] We respectfully submit that the Government in injecting issues not presented in its Jurisdictional Statement has violated Rule 40(1)(d)(2) of this Court, and this portion of the Government's brief should properly be disregarded.

[100] Because of the last minute nature of its present argument, the Government has apparently not had time to decide whether it believes the District Court should have judged United Electric's state as of 1959 or as of 1967. (See Govt. Brief, pp. 19, 20, 71, 73.)

benefit of record citation) that, left to itself, United Electric "would have vigorously pursued a policy of obtaining additional reserves to enable it to continue its substantial business as its existing reserves were depleted" (Gov't. Brief, pp. 73-74) is a pipe dream.

As the Principal Geologist of the State of Illinois put it *in 1967*: "So intense has been the interest in the more favorably situated strippable reserves, that I do not know of any prime acreage that is not now under control." (DX 34, A.Ex.259.) This paralleled the assessment, *again in 1967*, of Paul Weir Company that "there are not available for purchase from non-operating owners a sufficient number of adjoining tracts that when assembled would amount to strippable coal reserves over 10 million tons." (DX 87, attached letter, p. 3, A.Ex.793.)

Nor was this strip reserve scarcity a recent phenomenon in 1967. To the contrary, the evidence was that *"by 1960*, there was no longer any possibility of acquiring or establishing, for transfer to coal producers, of any new economically mineable strip coal acreage in the Illinois basin of sufficient size to justify the opening of new mines." (DX 88, A.Ex.796; see also DX 87, p. 27, A.Ex.779.) That such was the situation throughout the 1960's was common knowledge. As Mr. Nugent explained *in his 1968 deposition*, the unavailability of Midwest strip reserves was known to virtually everyone in the utility, mining equipment and coal industries—"down to cub engineers who have just been in the business a couple of years." (Nugent A.62.)[101]

[101] See pages 18 to 19, *supra*. As the Government knows full well, the court's observation that there was no evidence that "reserves are *presently* available," (J.S. App.63a; emphasis, the court's) was not intended to contrast United Electric's condition and prospects at trial with those obtaining in 1959. Rather, it was responsive to the Government's speculations at trial—repeated in its Jurisdictional Statement (J.S. 23-24) and here (Gov't. Brief, pp. 10, 13, 66,

That an independent United Electric could not have acquired the strip reserves needed to prolong its competitive life is further confirmed by the unsuccessful efforts to acquire such reserves made by Amalgamated *in the 1950's* and Humble *in the 1960's*. (Dorrance A.394; Stipulated Testimony of George H. Shipley, A.848.)

Finally, United Electric's own efforts, immediately following the merger and continuing thereafter, place the question beyond doubt. Prior to 1959, United Electric had not built properly for its future. It had no "real" land department, its competitors had far better prospecting organizations, and it had taken up only 7 of more than 200 fields of coal reserves its employees had examined; some of the best of these were dropped without investigation.[102] Frank Kolbe, the company's former President, defended United Electric's coal reserve policy during this time on the basis that the company had other uses for its money and that he did not care to tie up money for coal fields that would not be mined for a long time in the future.[103]

Once control of United Electric was gained in 1959 by Freeman, United Electric made a vigorous but unsuccessful effort to purchase additional coal reserves.[104] It was

---

73)—that mining conditions have changed in the past, that they may continue to change, and that "properties which UEC has investigated in the past . . . may become economically strippable in the future." (Gov't. Post-Trial Brief, p. 141; see also Def. Post-Trial Brief, pp. 88-89.)

[102] See, generally, DPF 84-91, 126-29, A.908-10, 919-21; Kolbe Dep. Ex. Y, p.3, A.Ex.1648; Morris A.1061-64; Latimer A.297-98, 310-19; Nugent A.66; Kolbe Dep. Ex. N, A.Ex.1629; DX 13, A.Ex. 224; Inman A.198-99.

[103] Kolbe A.141-42, 144-45, 149-50, 179-80.

[104] See, generally, DPF 92-99, A.910-12; Ames A.1450; Thorson A.1169-70, 1261; Nugent A.66-68, 1525-27; Morris A.1162; Inman A.212-13; Camicia A.88-90, 95-97, 1357-58, 1363-64, 1368-70; Hopper A.1498-1500; DX 113, pp.4080, 4086, 4138, 4196, A.Ex.1029-30, 1032, 1035.

made clear to the company's management that all of the money necessary would be made available for their acquisition,[105] and Robert Inman, United Electric's Vice President of Operations, testified (A.211) that he had an "open book" with respect to such expenditures. In their search for additional reserves, United Electric's personnel were given extremely wide latitude and were not limited to the acquisition of reserves with a potential of immediate commercial development only. (Nugent A.70-71; Camicia A.1369.) As the Government admitted, United Electric investigated many strip-coal areas throughout Illinois, Indiana, and Kentucky, but these efforts were unsuccessful. (DPF 95-96, A.911; GRF, p. 16.) The Government also admitted that "after 1959, UEC's management sought to acquire economically recoverable reserves, *i.e.*, reserves which were merchantable and capable of making a profit." (GRF, p. 15.)

The evidence was equally clear that United Electric's inability to undertake deep mining had nothing to do with whether it had remained independent or whether that reading is taken in 1959, 1967, or any other date. Long before the merger United Electric had repeatedly stressed that strip mining was its business and that deep mining was not.[106] And witness after witness attested to the fact that United Electric would have been unable successfully to undertake deep mining.[107] As the Paul Weir Company summed up the situation: "While it is, of course, impossible to state for certain whether or not United Electric would even have attempted to undertake deep mining, it is improbable that they could have done so successfully, and, there-

---

[105] Nugent A.70; DX 113, pp.4080, 4086, 4138, 4196, A.Ex.1029-30, 1032, 1035; Camicia A.1363-64; Morris A.1162.

[106] See pages 22 to 23, *supra*.

[107] See pages 24 to 28, *supra*.

fore, highly unlikely that they would have tried." (DX 87, pp.29-30, A.Ex.781-82.)

The trial court's opinion makes plain that its analysis of the challenged combination was not confined narrowly to the time of trial. Rather it encompassed a full review of *all* the evidence on *all* the likely competitive consequences of the Freeman-United Electric affiliation—from its inception through the trial date and beyond. As the court below summarized the results of its two-year review of the record before it:

> "The challenged combination has been in effect *since 1959*, and yet no adverse consequences with respect to competition were shown either *to have occurred* or likely to occur." (J.S. App. 64a)[108]

It is incredible that the Government would fault the District Court for a supposed failure to make more findings with respect to United Electric's 1959 and 1967 prospects. The Government's claim *in this Court* that such findings are the key to the case is in sharp contrast with its claim *in the court below* that such findings were "irrelevant."

The Government *here* criticizes the trial court, for example, for the lack of specific findings showing that United Electric had "no alternative way of preserving its existence." (Gov't. Brief, p. 70.) But *below* it urged against making such findings. It asked the trial court to reject Defendants' Proposed Finding 426 (A.1003), stating that

---

[108] Time and again the trial court specifically addressed itself to a consideration of the evidence over the years. For example, "the combination is *in its second decade without demonstrating* any of the indicia of concentration" (J.S. App. 60a); "[t]he mines and coal reserves of United Electric are, *and have been since prior to 1959*, located in different Freight Rate Districts than the mines and coal reserves of Freeman" (J.S. App. 62a); and "[t]hese companies *have been* and are now predominantly complementary in nature." (J.S. App. 61a.)

"[i]t would not be possible for [United Electric] to enter into deep mining by acquiring a small deep mining company," on the ground that these facts of record were "irrelevant." (GRF, p.218.) Similarly, Defendants' Proposed Findings 116 through 123 (A.917-18), reviewing the evidence that "during the 1950's [United Electric] recognized the need to stem its deteriorating competitive position and that a merger was the only realistic way available to achieve this," were summarily "objected to as irrelevant." (GRF, p.22.)[109]

Viewed in retrospect, the Government's newly concocted argument hardly merits consideration. Indeed, criticism of the trial court's primary concern with events in the period immediately preceding and surrounding the trial comes with particularly ill grace when one considers that these were "the years chosen by the Government for analysis." (J.S. App. 62a.) Thus, the principal focus of the complaint is on 1965 to 1967 (Complaint, ¶ 11-20, A.12-14); the Government's alleged common customer charts were confined to the years 1965-67 (GX 88-91, A.Ex.107-17); all of the Government's concentration and market share charts combined United Electric and Freeman data only in 1967 and subsequent years (GX 73, 86, A.Ex.92, 100; compare GX 71, A.Ex.90, with GX 72, A.Ex. 91; and GX 84 with GX 85, A.Ex.98); and the Government advised the trial court that its coal industry rebuttal witnesses would be called to testify as to "the *availability* of strip and underground coal reserves" and "*future* strip mining possibilities." (Gov't. Counsel, A.1355.)

---

[109] The Government neglects to mention the District Court's finding that "[t]he evidence shows that United Electric had earlier [before the 1959 combination] made unsuccessful attempts to merge with, or to acquire, other Illinois coal producers." (J.S. App. 8a n.7.)

In any event, the Government's disquisition on the "failing company" doctrine is beside the point. The facts of record with respect to United Electric's liquidating nature —whenever viewed—do not constitute, as the Government would have it, an attempt to "justify an otherwise illegal merger." (Gov't. Brief, p. 64.) United Electric was not acquired by "one of its largest competitors" (Gov't. Brief, p. 70), but by Freeman—a firm which the District Court found, on the basis of all of the evidence in this case, "would not and could not" compete with an independent United Electric to any substantial degree. (J.S. App. 61a; see also J.S. App. 65a.) In view of the vigorous competition which United Electric-Freeman faces from other coal producers and suppliers of other fuels, the essentially complementary nature of the combination, and the bargaining power of large and sophisticated utilities, it is clear that this affiliation neither has had nor can have any adverse competitive impact.

In sum, the events which decreed that United Electric would reach the end of its competitive significance in the 1960's took place long prior to that date, and the evidence since then has demonstrated beyond cavil that United Electric was not capable of being "preserved"—by anyone. Unable in the end to overcome the weight of this evidence, the Government concludes its brief by asking this Court to reverse the District Court's factual findings—not on the basis of the record—but with an incredible plea for "judicial notice." (Gov't. Brief, pp. 73-74.)

CONCLUSION

The decision below comports completely with settled principles of merger law and policy, and signals no softening of, or retreat from, established barriers to anticompetitive mergers. It merely represents "the considered judgment of an able trial judge, after patient hearing, that the Government's evidence fell short of its allegations—a not uncommon form of litigation casualty, from which the Government is no more immune than others." *United States* v. *Yellow Cab Co.*, 338 U.S. 338, 341 (1949). That judgment should be affirmed.

Respectfully submitted,

HAMMOND E. CHAFFETZ
REUBEN L. HEDLUND
DONALD G. KEMPF, JR.
2900 Prudential Plaza
Chicago, Illinois 60601

KIRKLAND & ELLIS
Chicago, Illinois

ALBERT E. JENNER, JR.
One IBM Plaza
Chicago, Illinois 60611

JENNER & BLOCK
Chicago, Illinois

Of Counsel

Attorneys for Appellees

LIBRARY
SUPREME COURT, U. S.

FILE
NOV 29
MICHAEL RODAK, JR.

No. 72-402

In the Supreme Court of the United States

OCTOBER TERM, 1973

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

REPLY BRIEF FOR THE UNITED STATES

ROBERT H. BORK,
Solicitor General,
THOMAS E. KAUPER,
Assistant Attorney General,
DANIEL M. FRIEDMAN,
Deputy Solicitor General,
MARK L. EVANS,
Assistant to the Solicitor General,
CARL H. LAWSON,
JOHN R. WISE,
Attorneys,
Department of Justice,
Washington, D.C. 20530

In the Supreme Court of the United States

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA, APPELLANT

v.

GENERAL DYNAMICS CORPORATION, THE UNITED ELECTRIC COAL COMPANIES, AND FREEMAN COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

REPLY BRIEF FOR THE UNITED STATES

1. The major portion of appellees' brief (pp. 12–48) consists of a detailed factual discussion of the evidence that allegedly supports the district court's finding that the combination of the Freeman and United Electric coal companies would not substantially lessen competition. Thus, appellees discuss in detail, among other things, the evidence relating to the economic strength of electric utilities in bargaining with coal companies, the reasons why the merging companies allegedly really were not competing with each other with respect to the substantial sales they made to the same cus-

827-435—73——1

tomers, and the testimony of industry personnel that the merger would not adversely affect competition. They make no attempt, however, to refute the analysis in our opening brief that under the settled principles announced by this Court in a series of decisions over the last decade applying Section 7 of the Clayton Act, this merger is illegal because it significantly increased concentration in, and produced a firm controlling an undue percentage of, a concentrated market.

As we there explained, the concern of Congress in amending Section 7 of the Clayton Act in 1950 was to stem "what was considered to be a rising tide of economic concentration in the American economy" (*Brown Shoe Co.* v. *United States*, 370 U.S. 294, 315). The legislation was designed to block "mergers at a time when the trend to a lessening of competition in a line of commerce was still in its incipiency" (*id.* at 317). The focus of the statute was on changes in market structure that mergers produce rather than on specific competitive behavior; the purpose was "the protection of *competition*, not *competitors*" (*id.* at 320, emphasis in original). Section 7 deals "with probabilities, not certainties" (*id.* at 323) and "[t]his intense congressional concern with the trend toward concentration warrants dispensing, in certain cases, with elaborate proof of market structure, market behavior, or probable anticompetitive effects" (*United States* v. *Philadelphia National Bank*, 374 U.S. 321, 363).

The determination whether the effect of a particular merger may be substantially to lessen competition requires an examination of its impact upon the struc-

ture of the relevant markets. First, "[t]he 'area of effective competition' must be determined by reference to a product market (the 'line of commerce') and a geographic market (the 'section of the country')" (*Brown Shoe*, 370 U.S. at 324). It is only after the geographic and product markets have been properly defined that an informed judgment can be made whether the merger has the proscribed anticompetitive probability "in any line of commerce in any section of the country."[1]

"Statistics reflecting the shares of the market controlled by the industry leaders and the parties to the merger are, of course, the primary index of market power * * *" (*Brown Shoe*, 370 U.S. at 322, n. 38). "The market share which companies may control by merging is one of the most important factors to be considered when determining the probable effects of the combination on effective competition in the relevant market" (*id.* at 343, fn. omitted).

The district court here did not analyze or evaluate the probable effect of this merger on the structure of the relevant markets—coal as the product market and the Eastern Interior Coal Province sales area and the State of Illinois as the geographic markets (see our opening brief, pp. 20–50). Nor do appellees make any serious attempt to show that the district court cor-

[1] There may be situations in which the competitive impact of a merger may also be demonstrated in sections of the country which are not markets in the traditional customer-supplier sense, but which, nevertheless, are economically distinct areas within which competition occurs. See our jurisdictional statement in *United States* v. *The Connecticut National Bank, et al.*, No. 73-767. This is not such a case, however.

rectly applied the standards this Court traditionally has recognized as the proper touchstone for determining the validity of horizontal mergers.[2]

Instead, appellees argue (Br. 2) that the district court rulings on "market definition" that the government challenges "were neither critical to, nor controlling of, the decision below." This contention is directly at odds with this Court's admonitions that a proper assessment of the effect of a merger can be made "only in terms of the market affected" (*United States* v. *duPont & Co.*, 353 U.S. 586, 593), and that "the proper definition of the market is a 'necessary predicate' to an examination of the competition that may be affected by the horizontal aspects of the merger" (*Brown Shoe*, 370 U.S. at 335). The district court's failure to focus on this critical issue and to apply the many decisions of this Court that have invalidated horizontal mergers on the basis of the kind of struc-

[2] Appellees cite this Court's opinion in *United States* v. *Pabst Brewing Co.*, 384 U.S. 546, for the proposition that market definition may be here ignored. The issue in that case, however, was whether it was essential for the government to delineate a section of the country "by metes and bounds as a surveyor would lay off a plot of ground" (384 U.S. at 549, fn. omitted). The Court held it was enough to prove that "the merger may have a substantial anticompetitive effect somewhere in the United States—'in *any* section' of the United States" (*ibid.*; emphasis in original). Proof of the precise boundaries of the geographic market was held to be "entirely subsidiary to the crucial question in this and every § 7 case which is whether a merger may substantially lessen competition *anywhere* in the United States" (*id.* at 550; emphasis added). There is no implication that market definition may be dispensed with, only that metes and bounds precision is unnecessary.

tural analysis presented in our opening brief invalidates its conclusion that this merger did not have the anticompetitive effects proscribed by Section 7.

2. Appellees suggest, however (Br. 64–65), that this Court's decisions establish only that a merger producing such anticompetitive changes in market structure is *prima facie* illegal, and they contend that the district court's findings refute any *prima facie* illegality the government has shown.[3] To the extent that this argument stems from the claim that, at the time of the acquisition, United Electric's resources were so inadequate that it was no longer a viable entity and hence not a significant competitive factor in the market, we have answered it in our opening brief (pp. 63–74; see, also, point 3, *infra*). Implicit in appellees' contention, however, is the implication that there is something special about the coal industry that justifies a different approach and standard for determining the anticompetitive consequences of a horizontal merger of major firms. The suggestion that general antitrust principles should not be fully applied to particular industries is not novel, however (cf. *Citizen Publishing Co.* v. *United States*, 394 U.S. 131, 138,

[3] Appellees argue that this *prima facie* illegality is significant only when the district court "dismiss[es] the complaint at the close of the Government's case on the ground that it had failed to carry its initial burden of proof" (Br. 64). In *Philadelphia Bank*, itself, however, in which the theory was articulated, the government appealed from a judgment for the defendants after trial (374 U.S. at 323). The Court applied the same structural analysis in invalidating the merger in *United States* v. *Phillipsburg National Bank & Trust Co.*, 399 U.S. 350, where the district court had upheld the merger after a full trial.

n. 4). This Court has rejected such arguments before and should do so in this case.[4]

3. Appellees argue that the inadequate resources argument made in our opening brief (pp. 63–74) (1) was not made in our Jurisdictional Statement (Br. 2, 70, n. 99) and (2) is inconsistent with our position in the district court (Br. 74–75). The first of these claims is answered in our principal brief (p. 70, n. 47). The second is incorrect.

The government argued in its post-trial brief in the district court (p. 143) that United Electric's "inability to acquire additional coal reserves * * * is not a ground for approving an otherwise anticompetitive merger." More particularly, we urged there, as we do here (p. 144):

> The argument that the lack of reserves lessens future anticompetitive effect and therefore justifies the merger infers that [United Electric] is an *in futuro* wasting asset "failing company," entitled to the benefits of the failing company doctrine.

We urged that appellees had failed to satisfy the requirements of such a defense (pp. 143–146).

---

[4] In *United States* v. *Aluminum Company of America*, 377 U.S. 271, the appellees contended that the increases in concentration which the merger there produced were not sufficient to establish anticompetitive effect because of other countervailing market conditions. Brief for appellees, No. 204, O.T. 1963, pp. 49–51. This Court, however, held the merger invalid because of its change in the structure of the market: it increased Alcoa's share of the aluminum conductor market by 1.3 percent.

See, also, the argument of the Comptroller of the Currency at pages 35–39 of his brief in *United States* v. *Phillipsburg National Bank & Trust Co.*, 399 U.S. 350, No. 1093, O.T. 1969.

Similarly, our proposed conclusions of law included the following (p. 7; emphasis added):

> The United Electric Coal Companies' limited coal reserve position, *whether considered at the time of its merger into defendant General Dynamics* [1967], *or at the time it became controlled by defendant General Dynamics* through its subsidiary, defendant Freeman Coal Mining Corporation [1959], is not a defense to an otherwise unlawful merger of the United Electric Coal Companies into defendant General Dynamics Corporation. [Citing, *inter alia, Citizen Publishing Co.* v. *United States*, 394 U.S. 131.]

Appellees argued in response, as they argue here, that they were not required to meet the general standards for a failing company defense (post-trial brief, pp. 81–82). Indeed, their brief expressly acknowledged "the government's reliance * * * on cases concerning financially failing companies" (*id.* at 82).

Earlier in the proceeding, during the deposition of the appellees' expert, Professor Steiner, government counsel raised the issue. Among the questions he asked Professor Steiner were the following (A. 809):

"Directing your attention to that time, Professor, in your opinion was United Electric a firm which was heading inevitably in the direction of bankruptcy, with the grave probability that failure would ensue, that is, that the trend was irreversible?

* * * * *

"And Professor, is it your opinion that at the time in question, November of 1966, there were available to United Electric no reasonable, possible distinguishable or feasible alternatives which would have permitted

United Electric to remain an independent competitive factor within the bituminous coal industry?"

This is not a "newly concocted argument" (Br. 75). Our position in the district court was essentially the same as it is here: whether United Electric had ceased to be a significant factor in the coal business because of its allegedly inadequate reserves is a defense to be tested by the same standards applied under the failing company defense, and the critical time is when the acquisition took place (either 1959 or 1967).[8]

Respectfully submitted.

ROBERT H. BORK,
Solicitor General.
THOMAS E. KAUPER,
Assistant Attorney General.
DANIEL M. FRIEDMAN,
Deputy Solicitor General.
MARK L. EVANS,
Assistant to the Solicitor General.
CARL D. LAWSON,
JOHN B. WYSS,
Attorneys.

NOVEMBER 1973.

[8] Appellees point to a single finding of the district court that covers the period from 1959 to the present (Br. 74), but that finding does not bear on whether United Electric's reserves were at that time so depleted that it faced the imminent prospect of going out of business. Appellees also refer to some evidence in the record relating to the availability of strip reserves during the 1960's (Br. 71–74), but there is nothing to suggest that United Electric was about to cease operation or that there was no alternative means of rehabilitation short of merger with one of its largest competitors.

U.S. GOVERNMENT PRINTING OFFICE: 1973

UNITED STATES *v.* GENERAL DYNAMICS CORP. ET AL.

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

No. 72-402. Argued December 5, 1973—Decided March 19, 1974

Material Service Corp., a deep-mining coal producer, and its successor, appellee General Dynamics Corp., acquired, through stock purchases, control of appellee United Electric Coal Companies, a strip-mining coal producer. The Government brought suit alleging that this acquisition violated § 7 of the Clayton Act. The District Court found no violation on the ground, *inter alia*, that the Government's evidence—consisting principally of past production statistics showing that within certain geographic markets the coal industry was concentrated among a small number of large producers, that this concentration was increasing, and that the acquisition here would materially enlarge the acquiring company's market share and thereby contribute to the concentration trend—did not support the Government's contention that the acquisition substantially lessened competition in the production and sale of coal in either or both of two specified geographic markets. This conclusion was primarily based on a determination that United Electric's coal reserves were so low that its potential to compete with other producers in the future was far weaker than the aggregate production statistics relied on by the Government might otherwise have indicated, virtually all of United Electric's proved reserves being either depleted or already committed by long-term contracts with large customers so that its power to affect the price of coal was severely limited and steadily diminishing. *Held:*

1. While the Government's statistical showing might have been sufficient to support a finding of "undue concentration" in the absence of other considerations, the District Court was justified in finding that other pertinent factors affecting the coal industry and appellees' business mandated a conclusion that no substantial lessening of competition occurred or was threatened by the acquisition. Ample evidence showed that United Electric does not have sufficient reserves, which are a key factor in measuring

a coal producer's market strength, to make it a significant competitive force. Thus, in terms of probable future ability to compete, rather than in terms of past production on which the Government relied, the court was warranted in concluding that the merger did not violate § 7 of the Act. Pp. 494–504.

2. The District Court was justified in considering post-acquisition evidence relating to changes in the patterns and structure of the coal industry and in United Electric's reserve situation, since (unlike evidence showing only that no lessening of competition has yet occurred) the demonstration of weak coal resources necessarily implied that United Electric was not merely disinclined but unable to compete effectively for future contracts, such evidence going directly to the question whether future lessening of competition was probable. Pp. 504–506.

3. United Electric's weak reserves position, rather than establishing a "failing company" defense by showing that the company would have gone out of business but for the merger, went to the heart of the Government's statistical prima facie case and substantiated the District Court's conclusion that United Electric, even if it remained in the market, did not have sufficient reserves to compete effectively for long-term contracts, and therefore appellees' failure to meet the prerequisites of a failing-company defense did not detract from the validity of the District Court's analysis. Pp. 506–508.

4. Under the "clearly erroneous" standard of Fed. Rule Civ. Proc. 52 (a), which governs as fully on direct appeal to this Court as on review by a court of appeals, the District Court's findings and conclusions are supported by the evidence and are not clearly erroneous. P. 508.

5. The District Court found new strip reserves unavailable, and the mere possibility that United Electric could some day acquire expertise to mine deep reserves does not depreciate the validity of the conclusion that United Electric at the time of trial did not have the power to compete effectively for long-term contracts, nor does it give the production statistics relied on by the Government more significance than the District Court ascribed to them. Pp. 508–510.

341 F. Supp. 534, affirmed.

STEWART, J., delivered the opinion of the Court, in which BURGER, C. J., and BLACKMUN, POWELL, and REHNQUIST, JJ., joined. DOUG-

LAS, J., filed a dissenting opinion in which BRENNAN, WHITE, and MARSHALL, JJ., joined, *post*, p. 511.

Deputy Solicitor General Friedman argued the cause for the United States. With him on the briefs were *Solicitor General Bork*, former *Solicitor General Griswold*, *Assistant Attorney General Kauper*, *Mark L. Evans*, and *Carl D. Lawson*.

Reuben L. Hedlund argued the cause for appellees. With him on the brief were *Hammond E. Chaffetz*, *Donald G. Kempf, Jr.*, and *Albert E. Jenner, Jr.*

MR. JUSTICE STEWART delivered the opinion of the Court.

On September 22, 1967, the Government commenced this suit in the United States District Court for the Northern District of Illinois, challenging as violative of § 7 of the Clayton Act, 38 Stat. 731, as amended, 15 U. S. C. § 18, the acquisition of the stock of United Electric Coal Companies by Material Service Corp. and its successor, General Dynamics Corp. After lengthy discovery proceedings, a trial was held from March 30 to April 22, 1970, and on April 13, 1972, the District Court issued an opinion and judgment finding no violation of the Clayton Act. 341 F. Supp. 534. The Government appealed directly to this Court pursuant to the Expediting Act, 15 U. S. C. § 29, and we noted probable jurisdiction. 409 U. S. 1058.

I

At the time of the acquisition involved here, Material Service Corp. was a large midwest producer and supplier of building materials, concrete, limestone, and coal. All of its coal production was from deep-shaft mines operated by it or its affiliate, appellee Freeman Coal Mining Corp., and production from these operations

amounted to 6.9 million tons of coal in 1959 and 8.4 million tons in 1967. In 1954, Material Service began to acquire the stock of United Electric Coal Companies. United Electric at all relevant times operated only strip or open-pit mines in Illinois and Kentucky; at the time of trial in 1970 a number of its mines had closed and its operations had been reduced to four mines in Illinois and none in Kentucky.[1] In 1959, it produced 3.6 million tons of coal, and by 1967, it had increased this output to 5.7 million tons. Material Service's purchase of United Electric stock continued until 1959. At this point Material's holdings amounted to more than 34% of United Electric's outstanding shares and—all parties are now agreed on this point—Material had effective control of United Electric. The president of Freeman was elected chairman of United Electric's executive committee, and other changes in the corporate structure of United Electric were made at the behest of Material Service.

Some months after this takeover, Material Service was itself acquired by the appellee General Dynamics Corp. General Dynamics is a large diversified corporation, much of its revenues coming from sales of aircraft, communications, and marine products to Government agencies. The trial court found that its purchase of Material Service was part of a broad diversification program aimed at expanding General Dynamics into commercial, nondefense business. As a result of the purchase of Material Service, and through it, of Freeman and United Electric, General Dynamics became the Nation's fifth largest commercial coal producer. During the early 1960's General Dynamics increased its equity in United

[1] United Electric also had coal mining operations in Utah and other Western States. The Government has not contended, however, that these holdings are of any relevance in this case.

Electric by direct purchases of United Electric stock, and by 1966 it held or controlled 66.15% of United Electric's outstanding shares. In September 1966 the board of directors of General Dynamics authorized a tender offer to holders of the remaining United Electric stock. This offer was successful, and United Electric shortly thereafter became a wholly owned subsidiary of General Dynamics.

The thrust of the Government's complaint was that the acquisition of United Electric by Material Service in 1959 violated § 7 of the Clayton Act[2] because the takeover substantially lessened competition in the production and sale of coal in either or both of two geographic markets. It contended that a relevant "section of the country" within the meaning of § 7 was, alternatively, the State of Illinois or the Eastern Interior Coal Province Sales Area, the latter being one of four major coal distribution areas recognized by the coal industry and comprising Illinois and Indiana, and parts of Kentucky, Tennessee, Iowa, Minnesota, Wisconsin, and Missouri.[3]

---

[2] Section 7 of the Clayton Act reads in pertinent part as follows:

"No corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital and no corporation subject to the jurisdiction of the Federal Trade Commission shall acquire the whole or any part of the assets of another corporation engaged also in commerce, where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly."

[3] Testimony at trial indicated that the Eastern Interior Coal Province—the area of coal production upon which the Eastern Coal Province Sales Area was based—was originally named by United States Geological Survey maps of the coalfields in the United States and described one portion of a sequence of coal-bearing rock formations known geologically as the Pennsylvania System. The Sales Area of the Eastern Interior Coal Province was derived from the

At trial controversy focused on three basic issues: the propriety of coal as a "line of commerce," the definition of Illinois or the Eastern Interior Coal Province Sales Area as a relevant "section of the country," and the probability of a lessening of competition within these or any other product and geographic markets resulting from the acquisition. The District Court decided against the Government on each of these issues.

As to the relevant product market, the court found that coal faced strong and direct competition from other sources of energy such as oil, natural gas, nuclear energy, and geothermal power which created a cross-elasticity of demand among those various fuels. As a result, it concluded that coal, by itself, was not a permissible product market and that the "energy market" was the sole "line of commerce" in which anticompetitive effects could properly be canvassed.

Similarly, the District Court rejected the Government's proposed geographic markets on the ground that they were "based essentially on past and present production statistics and do not relate to actual coal consumption patterns." 341 F. Supp., at 556. The court found that a realistic geographic market should be defined in terms of transportation arteries and freight charges that determined the cost of delivered coal to purchasers and thus the competitive position of various coal producers. In particular, it found that freight rate districts, designated by the Interstate Commerce Commission for determining rail transportation rates, of which there were four in the area served by the appellee companies, were the prime determinants for the

assumption, acknowledged in the trial court's opinion, that the high costs of transporting coal—which may amount to 40% of the price of delivered coal—will inevitably give producers of coal a clear competitive advantage in sales in the immediate areas of the mines.

geographic competitive patterns among coal producers. In addition, the court concluded that two large and specialized coal consumption units were sufficiently differentiable in their coal use patterns to be included as relevant geographic areas.[4] In lieu of the State of Illinois or the Eastern Interior Coal Province Sales Area, the court accordingly found the relevant geographic market to be 10 smaller areas, comprising the two unique consumers together with four utility sales areas and four nonutility sales areas based on the ICC freight rate districts.

Finally, and, for purposes of this appeal most significantly, the District Court found that the evidence did not support the Government's contention that the 1959 acquisition of United Electric substantially lessened competition in any product or geographic market. This conclusion was based on four determinations made in the court's opinion, 341 F. Supp., at 558–559. First, the court noted that while the number of coal producers in the Eastern Interior Coal Province declined from 144 to 39 during the period of 1957–1967, this reduction "occurred not because small producers have been acquired by others, but as the inevitable result of the

[4] The trial court found that Commonwealth Edison, a large private electric utility with generation facilities in many parts of Illinois, and the Metropolitan Chicago Interstate Air Quality Control Region constituted separate and unique geographic regions. Commonwealth Edison was found to have unique attributes because of the great size of its coal consumption requirements, its distinctive distribution patterns, and its extensive commitment to air pollution programs and the development of nuclear energy. The Chicago Control Region, a congressionally designated area consisting of six counties in Illinois and two in Indiana, was distinguished from other geographic markets because of the impact of existing and anticipated air pollution regulations which would create special problems in the competition for coal sales contracts. 341 F. Supp. 534, 557.

change in the nature of demand for coal." Consequently, the court found, "this litigation presents a very different situation from that in such cases as United States v. Philadelphia National Bank, 374 U. S. 321 (1963), and United States v. Von's Grocery Co., 384 U. S. 270 (1966), where the Supreme Court was concerned with 'preventing even slight increases in concentration.' 374 U. S., at 365, n. 2." 341 F. Supp., at 558. Second, the court noted that United Electric and Freeman were "predominantly complementary in nature" since "United Electric is a strip mining company with no experience in deep mining nor likelihood of acquiring it [and] Freeman is a deep mining company with no experience or expertise in strip mining." *Ibid.* Third, the court found that if Commonwealth Edison, a large investor-owned public utility, were excluded, "none of the sales by United Electric in the period 1965 to 1967, the years chosen by the Government for analysis, would have or could have been competitive with Freeman, had the two companies been independent," because of relative distances from potential consumers and the resultant impact on relative competitive position. *Ibid.* Finally, the court found that United Electric's coal reserves were so low that its potential to compete with other coal producers in the future was far weaker than the aggregate production statistics relied on by the Government might otherwise have indicated. In particular, the court found that virtually all of United Electric's proved coal reserves were either depleted or already committed by long-term contracts with large customers, and that United Electric's power to affect the price of coal was thus severely limited and steadily diminishing. On the basis of these considerations, the court concluded: "Under these circumstances, continuation of the affiliation between United Electric and Freeman is not adverse

to competition, nor would divestiture benefit competition even were this court to accept the Government's unrealistic product and geographic market definitions." *Id.*, at 560.

II

The Government sought to prove a violation of § 7 of the Clayton Act principally through statistics showing that within certain geographic markets the coal industry was concentrated among a small number of large producers; that this concentration was increasing; and that the acquisition of United Electric would materially enlarge the market share of the acquiring company and thereby contribute to the trend toward concentration.

The concentration of the coal market in Illinois and, alternatively, in the Eastern Interior Coal Province was demonstrated by a table of the shares of the largest two, four, and 10 coal producing firms in each of these areas for both 1957 and 1967 that revealed the following: [5]

	Eastern Interior Coal Province		Illinois	
	1957	1967	1957	1967
Top 2 firms	29.6	48.6	37.8	52.9
Top 4 firms	43.0	62.9	54.5	75.2
Top 10 firms	65.5	91.4	84.0	98.0

These statistics, the Government argued, showed not only that the coal industry was concentrated among a small number of leading producers, but that the trend had been toward increasing concentration.[6] Furthermore, the un-

[5] The figures for 1967 reflect the impact on market concentration of the acquisition involved here.

[6] The figures demonstrating the degree of concentration in the two coal markets chosen by the Government were roughly comparable to those in *United States* v. *Von's Grocery Co.*, 384 U. S. 270, where

disputed fact that the number of coal-producing firms in Illinois decreased almost 73% during the period of 1957 to 1967 from 144 to 39 was claimed to be indicative of the same trend. The acquisition of United Electric by Material Service resulted in increased concentration of coal sales among the leading producers in the areas chosen by the Government, as shown by the following table: [7]

	1959			1967		
	Share of top 2 but for merger	Share of top 2 given merger	Percent increase	Share of top 2 but for merger	Share of top 2 given merger	Percent increase
Province	33.1	37.9	14.5	45.0	48.6	8.0
Illinois	36.6	44.3	22.4	44.0	52.9	20.2

Finally, the Government's statistics indicated that the acquisition increased the share of the merged company

---

the top four firms in the market controlled 24.4% of the sales, the top eight 40.9%, and the top 12 48.8%. See *id.*, at 281 (WHITE, J., concurring). See also *United States* v. *Pabst Brewing Co.*, 384 U. S. 546, 551, where the top four producers of beer in Wisconsin were found to control 47.74% of the market, and the top 10 in the Nation and the local three-state area to control 45.06% and 58.93%, respectively. The statistics in the present case appear to represent a less advanced state of concentration than those involved in *United States* v. *Aluminum Co. of America*, 377 U. S. 271, 279, where the two largest firms held 50% of the market, and the top five and the top nine controlled, respectively, 76% and 95.7%; and in *United States* v. *Philadelphia National Bank*, 374 U. S. 321, 365, where the two largest banks controlled 44% of the pre-merger market.

[7] The percentage increase in concentration asserted here was thus analogous to that found in *Von's Grocery*, *supra*, where the concentration among the top four, eight, and 12 firms was increased, respectively, by 18.0%, 7.6%, and 2.5% as a result of the merger invalidated there. In *Philadelphia Bank*, *supra*, the 34% increase in concentration in the two largest firms from 44% to 59% was found to be clearly significant. 374 U. S., at 365.

in the Illinois and Eastern Interior Coal Province coal markets by significant degrees: [8]

	Province		Illinois	
	Rank	Share (percent)	Rank	Share (percent)
1959				
Freeman	2	7.6	2	15.1
United Electric	6	4.8	5	8.1
Combined	2	12.4	1	23.2
1967				
Freeman	5	6.5	2	12.9
United Electric	9	4.4	6	8.9
Combined	2	10.9	2	21.8

In prior decisions involving horizontal mergers between competitors, this Court has found prima facie violations of § 7 of the Clayton Act from aggregate statistics of the sort relied on by the United States in this case. In *Brown Shoe Co.* v. *United States*, 370 U. S. 294, the Court reviewed the legislative history of the most recent amendments to the Act and found that "[t]he dominant theme pervading congressional consideration of the 1950 amendments was a fear of what was considered to be a rising tide of economic concentration in the American economy." *Id.*, at 315. A year later, in *United States* v. *Philadelphia National Bank*, 374 U. S. 321, the Court clarified the relevance of a statistical demonstration of concentration in a particular industry and of the effects

[8] The 1959 Illinois figure of 23.2% was asserted by the Government to be comparable to the 23.94% share of the Wisconsin beer market found to be significant in *Pabst*, *supra*, and the 25% share controlled by the merged company in *United States* v. *Continental Can Co.*, 378 U. S. 441, 461. The Province figure of 12.4% was compared with the shares held by the merged companies in *Von's Grocery* (7.5%), and in the *Pabst* national (4.49%) and three-state (11.32%) markets.

thereupon of a merger or acquisition with the following language:

> "This intense congressional concern with the trend toward concentration warrants dispensing, in certain cases, with elaborate proof of market structure, market behavior, or probable anticompetitive effects. Specifically, we think that a merger which produces a firm controlling an undue percentage share of the relevant market, and results in a significant increase in the concentration of firms in that market, is so inherently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects." *Id.*, at 363.

See also *United States* v. *Continental Can Co.*, 378 U. S. 441, 458; *United States* v. *Von's Grocery Co.*, 384 U. S., at 277; *United States* v. *Pabst Brewing Co.*, 384 U. S. 546, 550–552.

The effect of adopting this approach to a determination of a "substantial" lessening of competition is to allow the Government to rest its case on a showing of even small increases of market share or market concentration in those industries or markets where concentration is already great or has been recently increasing, since "if concentration is already great, the importance of preventing even slight increases in concentration and so preserving the possibility of eventual deconcentration is correspondingly great." *United States* v. *Aluminum Co. of America*, 377 U. S. 271, 279, citing *United States* v. *Philadelphia National Bank*, 374 U. S., at 365 n. 42.

While the statistical showing proffered by the Government in this case, the accuracy of which was not discredited by the District Court or contested by the appellees, would under this approach have sufficed to

support a finding of "undue concentration" in the absence of other considerations, the question before us is whether the District Court was justified in finding that other pertinent factors affecting the coal industry and the business of the appellees mandated a conclusion that no substantial lessening of competition occurred or was threatened by the acquisition of United Electric. We are satisfied that the court's ultimate finding was not in error.

In *Brown Shoe* v. *United States, supra*, we cautioned that statistics concerning market share and concentration, while of great significance, were not conclusive indicators of anticompetitive effects:

> "Congress indicated plainly that a merger had to be functionally viewed, in the context of its particular industry." 370 U. S., at 321–322.
>
> "Statistics reflecting the shares of the market controlled by the industry leaders and the parties to the merger are, of course, the primary index of market power; but only a further examination of the particular market—its structure, history and probable future—can provide the appropriate setting for judging the probable anticompetitive effect of the merger." *Id.*, at 322 n. 38.

See also *United States* v. *Continental Can Co.*, 378 U. S., at 458. In this case, the District Court assessed the evidence of the "structure, history and probable future" of the coal industry, and on the basis of this assessment found no substantial probability of anticompetitive effects from the merger.

Much of the District Court's opinion was devoted to a description of the changes that have affected the coal industry since World War II. On the basis of more than three weeks of testimony and a voluminous record, the court discerned a number of clear and significant devel-

opments in the industry. First, it found that coal had become increasingly less able to compete with other sources of energy in many segments of the energy market. Following the War the industry entirely lost its largest single purchaser of coal—the railroads—and faced increasingly stiffer competition from oil and natural gas as sources of energy for industrial and residential uses. Because of these changes in consumption patterns, coal's share of the energy resources consumed in this country fell from 78.4% in 1920 to 21.4% in 1968. The court reviewed evidence attributing this decline not only to the changing relative economies of alternative fuels and to new distribution and consumption patterns, but also to more recent concern with the effect of coal use on the environment and consequent regulation of the extent and means of such coal consumption.

Second, the court found that to a growing extent since 1954, the electric utility industry has become the mainstay of coal consumption. While electric utilities consumed only 15.76% of the coal produced nationally in 1947, their share of total consumption increased every year thereafter, and in 1968 amounted to more than 59% of all the coal consumed throughout the Nation.[9]

Third, and most significantly, the court found that to an increasing degree, nearly all coal sold to utilities is transferred under long-term requirements contracts, under which coal producers promise to meet utilities' coal consumption requirements for a fixed period of time, and at predetermined prices. The court described the mutual benefits accruing to both producers and consumers of

[9] In 1968, electric utilities accounted for 59.09% of United States coal consumption, coke plants 18.20%, cement mills 1.88%, other manufacturing (including steel and rolling mills) 17.70%, and retail and miscellaneous consumers 3.14%.

coal from such long-term contracts in the following terms:

> "This major investment [in electric utility equipment] can be jeopardized by a disruption in the supply of coal. Utilities are, therefore, concerned with assuring the supply of coal to such a plant over its life. In addition, utilities desire to establish in advance, as closely as possible, what fuel costs will be for the life of the plant. For these reasons, utilities typically arrange long-term contracts for all or at least a major portion of the total fuel requirements for the life of the plant. . . .
>
> "The long-term contractual commitments are not only required from the consumer's standpoint, but are also necessary from the viewpoint of the coal supplier. Such commitments may require the development of new mining capacity. . . . Coal producers have been reluctant to invest in new mining capacity in the absence of long-term contractual commitments for the major portion of the mine's capacity. Furthermore, such long-term contractual commitments are often required before financing for the development of new capacity can be obtained by the producer." 341 F. Supp., at 543 (footnote omitted).

These developments in the patterns of coal distribution and consumption, the District Court found, have limited the amounts of coal immediately available for "spot" purchases on the open market, since "[t]he growing practice by coal producers of expanding mine capacity only to meet long-term contractual commitments and the gradual disappearance of the small truck mines has tended to limit the production capacity available for spot sales." *Ibid.*

Because of these fundamental changes in the structure of the market for coal, the District Court was justified in viewing the statistics relied on by the Government as insufficient to sustain its case. Evidence of past production does not, as a matter of logic, necessarily give a proper picture of a company's future ability to compete. In most situations, of course, the unstated assumption is that a company that has maintained a certain share of a market in the recent past will be in a position to do so in the immediate future. Thus, companies that have controlled sufficiently large shares of a concentrated market are barred from merger by § 7, not because of their past acts, but because their past performances imply an ability to continue to dominate with at least equal vigor. In markets involving groceries or beer, as in *Von's Grocery, supra,* and *Pabst, supra,* statistics involving annual sales naturally indicate the power of each company to compete in the future. Evidence of the amount of annual sales is relevant as a prediction of future competitive strength, since in most markets distribution systems and brand recognition are such significant factors that one may reasonably suppose that a company which has attracted a given number of sales will retain that competitive strength.

In the coal market, as analyzed by the District Court, however, statistical evidence of coal *production* was of considerably less significance. The bulk of the coal produced is delivered under long-term requirements contracts, and such sales thus do not represent the exercise of competitive power but rather the obligation to fulfill previously negotiated contracts at a previously fixed price. The focus of competition in a given time frame is not on the disposition of coal already produced but on the procurement of new long-term supply contracts. In this situation, a company's

past ability to produce is of limited significance, since it is in a position to offer for sale neither its past production nor the bulk of the coal it is presently capable of producing, which is typically already committed under a long-term supply contract. A more significant indicator of a company's power effectively to compete with other companies lies in the state of a company's uncommitted reserves of recoverable coal. A company with relatively large supplies of coal which are not already under contract to a consumer will have a more important influence upon competition in the contemporaneous negotiation of supply contracts than a firm with small reserves, even though the latter may presently produce a greater tonnage of coal. In a market where the availability and price for coal are set by long-term contracts rather than immediate or short-term purchases and sales, reserves rather than past production are the best measure of a company's ability to compete.

The testimony and exhibits in the District Court revealed that United Electric's coal reserve prospects were "unpromising." 341 F. Supp., at 559. United's relative position of strength in reserves was considerably weaker than its past and current ability to produce. While United ranked fifth among Illinois coal producers in terms of annual production, it was 10th in reserve holdings, and controlled less than 1% of the reserves held by coal producers in Illinois, Indiana, and western Kentucky. *Id.*, at 538. Many of the reserves held by United had already been depleted at the time of trial, forcing the closing of some of United's midwest mines.[10]

[10] The District Court found that while United Electric held six mines operating in the midwest in 1948, it had opened only three new ones since then and four had closed because of exhaustion of reserves. The court found that the evidence showed that reserves in two other mines would soon be depleted, and the appellees inform us in their briefs that these events have already occurred.

Even more significantly, the District Court found that of the 52,033,304 tons of currently mineable reserves in Illinois, Indiana, and Kentucky controlled by United, only four million tons had not already been committed under long-term contracts. United was found to be facing the future with relatively depleted resources at its disposal, and with the vast majority of those resources already committed under contracts allowing no further adjustment in price. In addition, the District Court found that "United Electric has neither the possibility of acquiring more [reserves] nor the ability to develop deep coal reserves," and thus was not in a position to increase its reserves to replace those already depleted or committed. *Id.*, at 560.

Viewed in terms of present and future reserve prospects—and thus in terms of probable future ability to compete—rather than in terms of past production, the District Court held that United Electric was a far less significant factor in the coal market than the Government contended or the production statistics seemed to indicate. While the company had been and remained a "highly profitable" and efficient producer of relatively large amounts of coal, its current and future power to compete for subsequent long-term contracts was severely limited by its scarce uncommitted resources.[11] Irrespective of the company's size when viewed as a producer, its weakness as a competitor was properly

[11] As an example of the impact of depleted or committed reserves on a company's ability to compete for long-term contracts, the District Court noted that a number of requirements contracts signed by United Electric to supply coal to electric utilities were backed up by reserves belonging to Freeman and "*could not have been obtained without that guarantee*" because of the utilities' fear that the contract obligation could not otherwise be fulfilled. 341 F. Supp., at 559 (emphasis in original).

analyzed by the District Court and fully substantiated that court's conclusion that its acquisition by Material Service would not "substantially . . . lessen competition . . . ." The validity of this conclusion is not undermined, we think, by the three-faceted attack made upon it by the Government in this Court—to which we now turn.

III

First, the Government urges that the court committed legal error by giving undue consideration to facts occurring after the effective acquisition in 1959.[12] In *FTC* v. *Consolidated Foods Corp.*, 380 U. S. 592, 598, this Court stated that post-acquisition evidence tending to diminish the probability or impact of anticompetitive effects might be considered in a § 7 case. See also *United States* v. *E. I. du Pont de Nemours & Co.*, 353 U. S. 586, 597 *et seq.*, 602 *et seq.* But in *Consolidated Foods, supra,* and in *United States* v. *Continental Can Co.*, 378 U. S., at 463, the probative value of such evidence was found to be extremely limited, and judgments against the Government were in each instance reversed in part because "too much weight" had been given to post-acquisition events. The need for such a limitation is obvious. If a demonstration that no anticompetitive effects had occurred at the time of trial or of judgment constituted a permissible defense to a § 7 divestiture suit, violators could stave off such actions

[12] The court's reliance on such facts and the absence of specific findings of fact concerning the competitive situation in 1959, at which point both sides now agree the acquisition took place, may have been engendered by the Government's apparent inconsistency in its position concerning the critical date. Certain of the appellees' proposed findings of fact concerning United Electric's resources in 1959 and its attempts to increase its depleted holdings were termed "irrelevant" by the Government at the trial.

merely by refraining from aggressive or anticompetitive behavior when such a suit was threatened or pending.[13]

Furthermore, the fact that no concrete anticompetitive symptoms have occurred does not itself imply that competition has not already been affected, "for once the two companies are united no one knows what the fate of the acquired company and its competitors would have been but for the merger." *FTC* v. *Consolidated Foods, supra,* at 598. And, most significantly, § 7 deals in "probabilities, not certainties," *Brown Shoe* v. *United States,* 370 U. S., at 323, and the mere nonoccurrence of a substantial lessening of competition in the interval between acquisition and trial does not mean that no substantial lessening will develop thereafter; the essential question remains whether the probability of such *future* impact exists at the time of trial.

---

[13] The mere nonoccurrence of anticompetitive effects from a merger would, of course, merely postpone rather than preclude a divestiture suit. This Court indicated in *United States* v. *E. I. du Pont de Nemours & Co.*, 353 U. S. 586, 597, that a merger may be attacked *ab initio* long after its culmination if effect on competition not apparent immediately after the merger subsequently appears, since § 7 was designed to arrest the creation of monopolies "'in their incipiency'" and "'incipiency' . . . denotes not the time the stock was acquired, but any time when the acquisition threatens to ripen into a prohibited effect. . . ." See also *FTC* v. *Consolidated Foods Corp.*, 380 U. S. 592, 598. The scope this "time of suit" concept gives to the Government in attacking mergers under § 7 is discussed in Orrick, The Clayton Act: Then and Now, 24 ABA Antitrust Section 44 (1964); Subcommittee on Section 7, The Backward Sweep Theory and the Oligopoly Problem, 32 ABA Antitrust L. J. 306 (1966). In the context of the present case, the "time of suit" rule coupled with the limited weight given to post-merger evidence of no anticompetitive impact tends to give the Government a "heads-I-win, tails-you-lose" advantage over a § 7 defendant: post-merger evidence showing a lessening of competition may constitute an "incipiency" on which to base a divestiture suit, but evidence showing that such lessening has not, in fact, occurred cannot be accorded "too much weight."

In this case, the District Court relied on evidence relating to changes in the patterns and structure of the coal industry and in United Electric's coal reserve situation after the time of acquisition in 1959. Such evidence could not reflect a positive decision on the part of the merged companies to deliberately but temporarily refrain from anticompetitive actions, nor could it reasonably be thought to reflect less active competition than that which might have occurred had there not been an acquisition in 1959. As the District Court convincingly found, the trend toward increased dependence on utilities as consumers of coal and toward the near-exclusive use of long-term contracts was the product of inevitable pressures on the coal industry in all parts of the country. And, unlike evidence showing only that no lessening of competition has yet occurred, the demonstration of weak coal resources necessarily and logically implied that United Electric was not merely disinclined but unable to compete effectively for future contracts. Such evidence went directly to the question of whether future lessening of competition was probable, and the District Court was fully justified in using it.

Second, the Government contends that reliance on depleted and committed resources is essentially a "failing company" defense which must meet the strict limits placed on that defense by this Court's decisions in *United States* v. *Third National Bank in Nashville*, 390 U. S. 171; *Citizen Publishing Co.* v. *United States*, 394 U. S. 131; and *United States* v. *Greater Buffalo Press*, 402 U. S. 549. The failing-company doctrine, recognized as a valid defense to a § 7 suit in *Brown Shoe*, *supra*, at 346, was first announced by this Court in *International Shoe Co.* v. *FTC*, 280 U. S. 291, and was preserved by explicit references in the legislative history of the modern amendments to § 7. H. R. Rep. No. 1191, 81st Cong., 1st Sess., 6 (1949); S. Rep. No. 1775, 81st Cong., 2d Sess.,

7 (1950). A company invoking the defense has the burden [14] of showing that its "resources [were] so depleted and the prospect of rehabilitation so remote that it faced the grave probability of a business failure . . . ," *International Shoe, supra,* at 302, and further that it tried and failed to merge with a company other than the acquiring one, *Citizen Publishing Co., supra,* at 138; *Greater Buffalo Press, supra,* at 555.

The Government asserts that United Electric was a healthy and thriving company at the time of the acquisition and could not be considered on the brink of failure, and also that the appellees have not shown that Material Service was the only available acquiring company. These considerations would be significant if the District Court had found no violation of § 7 by reason of United Electric's being a failing company, but the District Court's conclusion was not, as the Government suggests, identical with or even analogous to such a finding. The failing-company defense presupposes that the effect on competition and the "loss to [the company's] stockholders and injury to the communities where its plants were operated," *International Shoe, supra,* at 302, will be less if a company continues to exist even as a party to a merger than if it disappears entirely from the market. It is, in a sense, a "lesser of two evils" approach, in which the possible threat to competition resulting from an acquisition is deemed preferable to the adverse impact on competition and other losses if the company goes out of business.[15]

---

[14] In *Citizen Publishing Co.* v. *United States,* 394 U. S. 131, 138–139, "[t]he burden of proving that the conditions of the failing company doctrine have been satisfied" was found to be "on those who seek refuge under it." (Footnote omitted.)

[15] Alternative rationales for the failing-company defense are discussed in Bok, Section 7 of the Clayton Act and the Merging of Law and Economics, 74 Harv. L. Rev. 226, 339–347 (1960); Com-

The appellees' demonstration of United's weak reserves position, however, proved an entirely different point. Rather than showing that United would have gone out of business but for the merger with Material Service, the finding of inadequate reserves went to the heart of the Government's statistical prima facie case based on production figures and substantiated the District Court's conclusion that United Electric, even if it remained in the market, did not have sufficient reserves to compete effectively for long-term contracts. The failing-company defense is simply inapposite to this finding and the failure of the appellees to meet the prerequisites of that doctrine did not detract from the validity of the court's analysis.

Finally, the Government contends that the factual underpinning of the District Court's opinion was not supported by the evidence contained in the record, and should be re-evaluated by this Court. The findings and conclusions of the District Court are, of course, governed by the "clearly erroneous" standard of Fed. Rule Civ. Proc. 52 (a) just as fully on direct appeal to this Court as when a civil case is being reviewed by a court of appeals. The record in this case contains thousands of pages of transcript and hundreds of exhibits. Little purpose would be served by discussing in detail each of the Government's specific factual contentions. Suffice it to say that we find the controlling findings and conclusions contained in the District Court's careful and lengthy opinion to be supported by the evidence in the record and not clearly erroneous.

One factual claim by the Government, however, goes to the heart of the reasoning of the District Court and thus is worthy of explicit note here. The Government

---

ment, "Substantially to Lessen Competition . . .": Current Problems of Horizontal Mergers, 68 Yale L. J. 1627, 1662–1668 (1959).

asserts that the paucity of United Electric's coal reserves could not have the significance perceived by the District Court, since all companies engaged in extracting minerals at some point deplete their reserves and then acquire new reserves or the new technology required to extract more minerals from their existing holdings. United Electric, the Government suggests, could at any point either purchase new strip reserves or acquire the expertise to recover currently held deep reserves.

But the District Court specifically found new strip reserves not to be available: "Evidence was presented at trial by experts, by state officials, by industry witnesses and by the Government itself indicating that economically mineable strip reserves that would permit United Electric to continue operations beyond the life of its present mines are not available. The Government failed to come forward with any evidence that such reserves are *presently* available." 341 F. Supp., at 559. In addition, there was considerable testimony at trial, apparently credited by the District Court, indicating that United Electric and others had tried to find additional strip reserves not already held for coal production, and had been largely unable to do so.

Moreover, the hypothetical possibility that United Electric might in the future acquire the expertise to mine deep reserves proves nothing—or too much. As the Government pointed out in its brief and at oral argument, in recent years a number of companies with no prior experience in extracting coal have purchased coal reserves and entered the coal production business in order to diversify and complement their current operations. The mere possibility that United Electric, in common with all other companies with the inclination and the corporate treasury to do so, could some day expand into an essentially new line of business does not depreciate the validity of

the conclusion that United Electric at the time of the trial did not have the power to compete on a significant scale for the procurement of future long-term contracts, nor does it vest in the production statistics relied on by the Government more significance than ascribed to them by the District Court.

IV

In addition to contending that the District Court erred in finding that the acquisition of United Electric would not substantially lessen competition, the Government urges us to review the court's determinations of the proper product and geographic markets. The Government suggests that while the "energy market" might have been *an* appropriate "line of commerce," coal also had sufficient "practical indicia" as a separate "line of commerce" to qualify as an independent and consistent submarket. Cf. *United States* v. *Continental Can Co.*, 378 U. S., at 456–457. It also suggests that irrespective of the validity of the criteria adopted by the District Court in selecting its 10 geographic markets, competition between United Electric and Material Service within the larger alternative geographic markets claimed by the Government established those areas as a permissible "section of the country" within the meaning of § 7.

While under normal circumstances a delineation of proper geographic and product markets is a necessary precondition to assessment of the probabilities of a substantial effect on competition within them, in this case we nevertheless affirm the District Court's judgment without reaching these questions. By determining that the amount and availability of usable reserves, and not the past annual production figures relied on by the Government, were the proper indicators of future ability to compete, the District Court wholly rejected the Govern-

ment's prima facie case. Irrespective of the markets within which the acquiring and the acquired company might be viewed as competitors for purposes of this § 7 suit, the Government's statistical presentation simply did not establish that a substantial lessening of competition was likely to occur in any market. By concluding that "divestiture [would not] benefit competition even were this court to accept the Government's unrealistic product and geographic market definitions," 341 F. Supp., at 560, the District Court rendered superfluous its further determinations that the Government also erred in its choice of relevant markets. Since we agree with the District Court that the Government's reliance on production statistics in the context of this case was insufficient, it follows that the judgment before us may be affirmed without reaching the issues of geographic and product markets.

The judgment of the District Court is affirmed.

It is so ordered.

MR. JUSTICE DOUGLAS, with whom MR. JUSTICE BRENNAN, MR. JUSTICE WHITE, and MR. JUSTICE MARSHALL concur, dissenting.

In this case the United States appeals from a District Court decision [1] upholding the acquisition of stock in United Electric Coal Companies by Material Service Corp. and its successor, General Dynamics Corp., against a challenge that the acquisition violated § 7 of the Clayton Act.[2] The United States instituted this civil anti-

[1] 341 F. Supp. 534 (1972).

[2] Title 15 U. S. C. § 18 provides:

"No corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital and no corporation subject to the jurisdiction of the Federal Trade Commission shall acquire the whole or any part of the assets of

trust action on the claim that the acquisition may substantially lessen competition in the Illinois and Eastern Interior Coal Province (EICP) sales area coal markets. After trial on the merits the District Court rejected the Government's proposed product and geographic markets and dismissed the action, concluding that the Government had failed to show a substantial lessening of competition in the markets the court deemed relevant.

I

The combination here challenged is the union of two major Illinois coal producers—Freeman Coal Mining Corp. and United Electric Coal Companies—under the ultimate corporate control of General Dynamics Corp. Material Service Corp. acquired all the stock of Freeman Coal in 1942 and began to acquire United Electric stock in 1954. By 1959, holdings in United reached 34%, and Material Service requested and received representation on United's board of directors. As a result, Freeman's president was elected chairman of United's executive committee. "With the affiliation of Freeman and United Electric thus formalized in 1959, common control of the two coal companies was achieved." 341 F. Supp. 534, 537 (1972).

General Dynamics acquired Material Service Corp. in 1959 and moved to solidify the union of Freeman and United by engaging in continued purchases of United's stock throughout the early 1960's. By 1966 it held nearly two-thirds of United's outstanding shares and a successful tender offer increased the holdings to over 90%. In early 1967 United became a wholly owned subsidiary of

---

another corporation engaged also in commerce, where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly."

General Dynamics. With the 1959 union of Freeman and United Electric thus completed, the Government filed this action challenging the legality of the combination which produced in General Dynamics the Nation's fifth largest coal producer with total annual production of over 14 million tons.

II

Section 7 of the Clayton Act, the standard against which this combination must be tested, proscribes such combinations "where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition . . . ."[3] "Determination of the relevant market is a necessary predicate to a finding of a violation of the Clayton Act . . . ." *United States* v. *E. I. du Pont de Nemours & Co.*, 353 U. S. 586, 593 (1957). The court below concluded that "the energy market is the appropriate line of commerce for testing the competitive effect of the United Electric-Freeman combination." 341 F. Supp., at 555. The court rejected the Government's hypothesis of coal as a submarket for antitrust purposes as "untenable," finding that *United States* v. *Continental Can Co.*, 378 U. S. 441 (1964), "compel[s] this court to conclude that since coal competes with gas, oil, uranium and other forms of energy, the relevant line of commerce must encompass interfuel competition." 341 F. Supp., at 556.

I read *Continental Can* to import no such compulsion. That case involved the acquisition of the Nation's third largest producer of glass containers, Hazel-Atlas Glass Co., by Continental Can, the country's second largest producer of metal containers. The District Court found interindustry competition an insufficient predicate for finding a § 7 line of commerce embracing both cans and

[3] *Supra*, n. 2.

bottles. We reversed, finding that interindustry competition mandated "treating as a relevant product market the combined glass and metal container industries and all end uses for which they compete." 378 U. S., at 457 (emphasis added). But that interindustry market was only one of several lines of commerce in that case. Both parties conceded that "the can industry and the glass container industry were relevant lines of commerce." *Id.*, at 447. Since § 7 proscribes acquisitions which may involve a substantial lessening of competition in *any* line of commerce, the absence of anticompetitive effects in either the bottle or can markets could not sustain the acquisition since there existed *a* market—the glass/metal container market given recognition in this Court—in which the prohibited effect was present.

The District Court here found an energy market in which the combination did not work the prohibited effect. Whatever the correctness of that finding, *Continental Can* teaches us that it is of no help to appellees if there exist other lines of commerce in which the effect is present. Any combination may involve myriad lines of commerce; the existence of an energy market is not inconsistent with and does not negate the existence of a narrower coal market for "within this broad market, well-defined submarkets may exist which, in themselves, constitute product markets for antitrust purposes." *Brown Shoe Co.* v. *United States*, 370 U. S. 294, 325 (1962).

This principle found recognition in *Continental Can* where we recognized glass and metal containers "to be two separate lines of commerce," despite finding that competition between the lines "necessarily implied one or more *other* lines of commerce embracing both industries." 378 U. S., at 456–457 (emphasis added). It was also recognized in *United States* v. *Aluminum Co. of America*, 377 U. S. 271 (1964), which involved the com-

bination of an aluminum conductor manufacturer and a producer of both aluminum and copper conductor. The District Court there refused to treat aluminum conductor as a separate § 7 line of commerce because of the competition between aluminum and copper conductor. Though we found that competition sufficient to justify finding a single aluminum/copper conductor market, we reversed the District Court, holding that the interindustry competition did not preclude "division [of that market] for purposes of § 7 into separate submarkets." *Id.*, at 275.[4]

Coal has both price advantages and operational disadvantages which combine to delineate within the energy market "economically significant submarket[s]."[5] The consumers for whom price is determinative mark out a submarket in which coal is the overwhelming choice; the boundaries of this submarket are strengthened by coal's virtual inability to compete in other significant sectors of the energy market. Energy-use technology in highway and air transportation necessitates the use of liquid fuels. The relative operational ease of dieselized power plants has worked to virtually foreclose coal from the rail transportation market.[6] Despite their higher cost, gas and oil enjoy a competitive edge in the space-heating market because of simple consumer preference for these sources of energy over coal.[7]

The market for coal is therefore effectively limited to large industrial energy consumers such as electric utilities and certain manufacturers with the ability and economic

---

[4] Similarly, in *United States* v. *Philadelphia National Bank*, 374 U. S. 321 (1963), we held commercial banking a § 7 line of commerce even though banks compete with other institutions with respect to some services such as the making of small loans.

[5] See *Brown Shoe Co.* v. *United States*, 370 U. S. 294, 325 (1962).

[6] 341 F. Supp., at 539.

[7] *Ibid.*

incentive to consider coal as an energy source.[8] The court below noted that the "utility market has become the mainstay of coal production," 341 F. Supp., at 539, accounting for 72% of total national coal consumption in 1968. Within this sector coal's economic advantage yields it an overwhelming share of the market. In each year from 1960 to 1967 (the period during which the Freeman-United Electric union solidified) coal accounted for over 90% of the B.t.u.'s consumed by steam electric utility plants in the EICP sales area; it also provided 74% of the B.t.u.'s consumed by cement plants in the same area and 94% of the B.t.u.'s consumed by such plants in Illinois.[9]

The coal market is therefore viewed by energy consumers as a separate economic entity confined to those users with the technological capability to allow the use of coal and the incentive for economy to mandate it. Within that market coal experiences little competition from other fuels since coal's delivered price per B.t.u. in the areas served by Freeman and United Electric is significantly lower than that for any other combustible fuel except interruptible natural gas which is available only on a seasonal basis.[10] Central Illinois Light Co., for example, purchases coal at 27 cents per million B.t.u.'s,

---

[8] The only other significant use for coal is metallurgical in nature. Metallurgical coal is used as a product in the manufacture of steel. The use of such coal as a product sets it off in a separate market from nonmetallurgical coal which is used as an energy source.

[9] Although nuclear and geothermal power may draw some utility consumers from the coal market in the future, nuclear fuel is not consumable in existing fossil-fuel plants nor is nuclear fuel presently an alternative for nonutility coal consumers. Thus, whatever the future inroads of alternative fuels, there remains a significant class of energy consumers which looks only to coal.

[10] Interruptible gas is sold at a lower rate and is available only when it is not required by firm-rate customers which are supplied according to their needs and which always have priority.

firm natural gas at 45 cents, and oil (for ignition purposes) at 70 cents.[11] Since coal consumption facilities are unique and not readily adaptable to alternative energy sources, there is little interfuel price sensitivity. As the court in *Kennecott Copper Corp.* v. *FTC*, 467 F. 2d 67, 79 (CA10 1972), stated in finding that "[t]he coal industry is a distinct submarket which has characteristics which are not shared by the other fuel industries," coal prices "are now, and promise to be in the future, subject to the peculiarities of the coal business [since] other fuels appear to have a limited effect."

The competitive position of coal is thus not unlike that of aluminum conductor in *United States* v. *Aluminum Co. of America, supra.* Like coal, aluminum conductor had "little consumer acceptance" for many purposes, but its substantial price advantage over other conductors gave it "decisive advantages" in those areas of the market where price was "the single, most important, practical factor." 377 U. S., at 275–276. Despite the existence of some competition from other forms of conductor, those factors were sufficient to set aluminum conductor apart as an economically significant § 7 submarket. That precedent seems to be indistinguishable; and thus whatever the existence of a § 7 energy market, coal constitutes an economically significant submarket for § 7 purposes.[12]

III

In rejecting the Government's proposed geographic markets the court below adopted much narrower mar-

[11] Oil is used by some coal consumers for purposes to which coal is not suited such as starting up boilers or kilns.

[12] Even the court below gave some recognition to coal as a separate market in its discussion of the relevant geographic markets. The geographic markets were delineated along "the distributive patterns of . . . coal," separating out those "mines to which *coal* consumers can practicably turn for supplies." 341 F. Supp., at 556 (emphasis added).

kets which, for the most part, followed ICC freight rate districts (FRD's).[13] The justification was that, since ordinary rail rates are the same for all mines in any particular FRD and since transportation costs are the principal competitive factor in coal marketing, mines in one FRD cannot effectively compete for the same customers with mines in other FRD's. Since United Electric's mines are located in the Belleville and Fulton-Peoria FRD's and Freeman's mines are located in the Springfield and Southern Illinois FRD's, the combination of the two companies was found to present no risk of anticompetitive effects.

The error of the District Court in drawing the § 7 sections of the country "so narrowly as to place appellees in different markets"[14] is amply demonstrated by the overlapping distribution patterns of Freeman and United Electric. Though located in different FRD's and thus supposedly not competitive, they sold one-half their output to the same customers at the same facilities. Lack of competition between FRD's is further refuted by the existence of reciprocal selling patterns. For example,

---

[13] Freight rate districts are producing areas grouped for ICC rate-making purposes; all mines within each producing area are accorded the same rates to the same consuming destinations. See *Ayrshire Collieries Corp.* v. *United States*, 335 U. S. 573, 576 (1949). The other markets accepted by the District Court are Commonwealth Edison and the Metropolitan Chicago Interstate Air Quality Control Region. Commonwealth Edison was found to be unique in light of its massive coal requirements, its purchasing patterns which are "quite distinct from [those] followed by other consumers," and its singularly extensive commitment to nuclear energy. The MCIAQC, consisting of six Northeastern Illinois counties and two Northwestern Indiana counties, was found unique because of its singular access, through water and rail arteries, to almost all FRD's in the Midwest.

[14] See *United States* v. *Philadelphia National Bank*, 374 U. S., at 361.

while United's Belleville FRD mine was selling 25% of its output to customers in the Southern Illinois FRD sales area, Freeman was selling 20% of its Southern Illinois FRD coal to Belleville sales area customers.

The inability of the lower court's narrow markets to "'correspond to the commercial realities'" [15] of the distribution patterns displayed in the record is explained by the undue weight given ordinary rail rates. While transportation costs are significant, ordinary rail rates are not the single controlling element of transportation costs. First, not all rail shipments are governed by FRD rates; many of the most significant shipments are transported via "unit trains" carrying only coal from a particular producer to a particular customer pursuant to a negotiated rate. Thus Freeman ships Southern Illinois FRD coal by unit train to a Belleville FRD sales area customer at a cost *lower* than any Belleville FRD rate to that location. Second, not all coal transportation proceeds by rail. United transports most of its coal by barge, and in 1967 only one-half of all the coal sold in the five States which receive coal from Illinois was transported by all-rail shipments.

Normal rail rates are thus not so limiting as to eliminate substantial competition between FRD sales areas. Coal producers may constitute strong competitive factors in areas up to 500 miles from the mine. Thus in 1967 Freeman's Southern Illinois FRD Orient Mine shipped over 1.5 million tons of coal to customers 300 to 500 miles away. At the same time, United's Fidelity Mine, only 40 miles from the Orient, shipped more than 1 million tons, over half its total production, to equally distant locations. Both Freeman and United Electric have mines which are capable of supplying any point in the EICP sales area.

[15] See *Brown Shoe Co.* v. *United States*, 370 U. S., at 336.

Further, even assuming the existence of FRD markets, I think the court below erred in rejecting the Government's proposed markets. As with product markets, § 7 does not necessitate an anticompetitive effect in any particular geographic market; its proscription reaches combinations which may substantially lessen competition in *any* section of the country. Thus, whatever the correctness of the District Court in finding FRD markets, the lack of anticompetitive effect in those markets is of no help to General Dynamics if competition may be lessened substantially in other geographic markets. And, as with product markets, the existence of FRD markets is not inconsistent with the existence of a myriad of other sometimes overlapping markets. Thus, in *United States* v. *Pabst Brewing Co.*, 384 U. S. 546 (1966), we found Wisconsin, the Wisconsin-Michigan-Illinois tristate area, and the entire United States all to be relevant § 7 sections of the country in which to assess anticompetitive impact.

While existing sales patterns show that transportation costs are not as restrictive as the District Court found, long-range transportation costs and the national distribution of coal deposits serve to divide the country into regionally significant coal markets. Both Freeman and United Electric are located in the EICP, consisting of Central and Southern Illinois, Southwestern Indiana and Western Kentucky. The region overlies a geologically united coal-bearing rock sequence which is estimated to contain 36% of the Nation's total coal resources. Because of the separation of the region from other major producing regions,[16] EICP producers enjoy a substantial

[16] The Nation's other major coal producing regions are: (1) the Eastern Coal Province of Western Pennsylvania, West Virginia, Eastern Kentucky, and parts of Ohio, Tennessee, and Alabama; (2) the Western Interior Coal Province comprised of Central Iowa,

competitive edge with respect to sales in an area composed of Illinois, Indiana, Western Kentucky, Tennessee, Eastern Iowa, Southeastern Minnesota, Southern Wisconsin, and extreme Eastern Missouri. In 1967, 82% of EICP coal was sold in this area. Freeman sold over 93% of its coal and United Electric sold over 97% of its coal in this area.

Within the EICP sales area, Illinois stands as an economically significant submarket. In 1967, 82% of the coal consumed in Illinois came from Illinois mines and 58% of the coal mined in the State was used there. Freeman sold 42% of its coal and United Electric sold 62% of its coal to Illinois consumers, more than either company sold in any other State. Since Illinois sales are dominated by Illinois producers and since all relevant Freeman and United Electric Mines are located in Illinois,[17] the State constitutes a relevant and significant market for § 7 purposes. Although economic lines do not fall precisely along political boundaries, the Government is not required to delineate § 7 markets by "metes and bounds." *United States* v. *Pabst Brewing, supra,* at 549. In holding a four-county group a relevant geographic market in *United States* v. *Philadelphia National Bank*, 374 U. S. 321 (1963), we noted the artificiality of such political boundaries but held that "such fuzziness would seem inherent in any attempt to delineate the relevant geographic market." *Id.*, at 360 n. 37. The State of Wisconsin was held a relevant market in *Pabst Brewing, supra,* and in *United States* v. *El Paso Gas Co.*, 376 U. S. 651, 657 (1964), we held that there could be "no

Northern and Western Missouri and Eastern Oklahoma; and (3) scattered deposits in Montana, Wyoming, Colorado, and Utah. Jurisdictional Statement 5.

[17] United Electric also controls some coal deposits in Colorado and Oklahoma which are not in issue in this case. 341 F. Supp., at 538 n. 8.

doubt that California is a 'section of the country' as that phrase is used in § 7."

IV

While finding no violation of § 7 in the Freeman-United Electric combination, the District Court did not make clear the standard used in reaching that ultimate conclusion. The court did not mention what it thought to be the relevant market shares nor did it discuss the effect of the combination on industry concentration. The court merely found that Freeman and United Electric do not compete because they are located in different FRD geographic markets, and because they sell different types of coal. As already discussed, nearly all the mines of both companies are located in Southern Illinois and as demonstrated by past distribution patterns, with an ability to compete effectively at distances up to 500 miles, their presence in different minute FRD's within Southern Illinois has simply *not* rendered them noncompetitive. The differences in the types of coal sold, moreover, are irrelevant. It is true as the court below notes that United Electric sells strip-mined coal while Freeman extracts deep reserves, but the fact that the companies sold half their output to common customers demonstrates that at least a significant portion of the consuming public is understandably unconcerned with the details of extraction. While it is also true that only Freeman sells metallurgical coal and a byproduct known as dust, this says nothing more than that the companies do not compete in metallurgical coal or dust; it does not relieve the court of the responsibility for evaluating the anticompetitive effects in nonmetallurgical coal production—production which accounts for 100% of United's and 92% of Freeman's business.[18]

[18] The lack of competition from United for a mere 8% of Freeman's business is simply irrelevant. In *United States* v. *Aluminum*

The court further found that United Electric, standing alone, would not contribute meaningfully to further competition since virtually all its economically mineable strip reserves were committed under long-term contracts and it possessed neither the capability to obtain more strip reserves nor the expertise to develop its deep reserves. Although the doctrine was not invoked by name, this appears to be an application of the "failing company" defense. See *Citizen Publishing Co.* v. *United States*, 394 U. S. 131 (1969). If it is, the court proceeded on an analysis made at the wrong time and failed to discuss the legal standards employed in finding the defense to be established. The finding that 48 of United's 52 million tons of strip reserves were committed related to the time of trial. But, since the rationale of the failing-company defense is the lack of anticompetitive consequence if one of the combining companies was about to disappear from the market at any rate, the viability of the "failing company" must be assessed as of the time of the merger. *United States* v. *Greater Buffalo Press*, 402 U. S. 549, 555 (1971); *Citizen Publishing Co.* v. *United States*, *supra*, at 138.

The Court urges that United's weak reserve position, rather than establishing a failing-company defense, "went to the heart of the Government's statistical prima facie case based on production figures." Under this view United's weak reserve position at the time of trial constitutes postacquisition evidence which diminishes the possibility of anticompetitive impact and thus directly affects the strength of time-of-acquisition findings. The problem

---

Co. of America, 377 U. S. 271 (1964), we struck down a combination which affected competition in the aluminum conductor market, and that result was not affected by the irrelevant fact that one of the companies, Rome Cable, also engaged in the production of copper conductor.

with this analysis is that the District Court made no time-of-acquisition findings which such postacquisition evidence could affect. The majority concedes the obvious need for a limitation on the weight given postacquisition evidence and notes that we have reversed cases where "too much weight" has been given. Here the postacquisition events were given *all* the weight because *all* the District Court's findings were made as of the time of the trial. While findings made as of the time of the merger could concededly be tempered to a limited degree by postacquisition events, no such findings were ever made.

Many of the commitments here which reduced United's available reserves occurred after the acquisition; 21 million tons for example were committed in 1968. Similarly, though the District Court found further mineable strip reserves unavailable at the time of trial, there is no finding that they were unavailable in 1959 or 1967. To the contrary, the record demonstrates that other coal producers did acquire new strip reserves during the 1960's.[19] United's 1959 viability is further supported by the fact that it possessed 27 million tons of deep reserves. While we do not know if all these reserves were economically mineable at the time of the acquisition, there was no finding that they would not become so in the near future with advances in technology or changes in the price structure of the coal market.[20] Further there was no contention or finding that further deep reserves were not available for acquisition.[21] The District Court

[19] See Brief for United States 71.

[20] Research into new methods of extraction or a rise in the price of coal could make reserves which are uneconomical to mine at any given time economically mineable in the future.

[21] To the contrary, United Electric acquired substantial new deep reserves after the time of the acquisition since it now owns about 44 million tons of deep reserves and controls by location another 40 to 50 million tons. Reserves are controlled by location if, in

merely concluded that United had no "ability to develop deep coal reserves." [22]

While it is true that United is a strip-mining company which has not extracted deep reserves since 1954, this does not mean that United would not develop deep-mining expertise if deep reserves were all it had left or that it could not sell the reserves to some company which poses less of a threat to increased concentration in the coal market than does Freeman. United Electric was not, as the Court suggests, merely one of many companies with the possible "inclination and the corporate treasury" to allow expansion into "an essentially new line of business." United was a coal company with a thriving coal-marketing structure. At the time of the merger it had access to at least 27 million tons of deep reserves and it had operated a deep mine only five years previously. While deep-coal mining may have been an essentially new line of business for many, it was for United merely a matter of regaining the expertise it once had to extract reserves it already owned for sale in a market where it already had a good name.

---

order to be mined at all, they must be mined by those who control, by ownership, lease, or option, the contiguous reserves.

[22] If that conclusion is to lend support to the combination on the ground that United "standing alone, cannot contribute meaningfully to competition," it must be made in light of the stringent standards applicable to the failing-company defense. In *Citizen Publishing Co.* v. *United States*, 394 U. S. 131, 138–139 (1969), we said that the defense is one of "narrow scope" and that the burden of proving the defense is "on those who seek refuge under it." We also stated that the prospects of continued independent existence must be "dim or nonexistent" and that it must be established that the acquiring company is the only available purchaser. See also *United States* v. *Greater Buffalo Press*, 402 U. S. 549, 555–556 (1971), and *United States* v. *Third National Bank in Nashville*, 390 U. S. 171, 189 (1968).

V

Thus, from product and geographic markets to market-share and industry-concentration analysis to the failing-company defense, the findings below are based on legal standards which are either incorrect or not disclosed. While the court did gratuitously state that no § 7 violation would be found "even were this court to accept the Government's unrealistic product and market definitions," this conclusory statement is supported by no analysis sufficient to allow review in this Court. The majority notes that production figures are of limited significance because they include deliveries under long-term contracts entered into in prior years. It is true that uncommitted reserves or sales of previously uncommitted coal would be preferable indicia of competitive strength, but the District Court made *no* findings as to United's or Freeman's respective market shares at the time of the acquisition under either of these standards.[23]

[23] The District Court did find that, as of 1968, Freeman controlled 6.5% of the total coal reserves dedicated to existing mines in the EICP. At the same time, United Electric controlled 2.5% of that total, but almost all of this was contractually committed. If market shares are to be determined by percentage of total reserves, what is necessary is a finding as to each company's 1959 share of uncommitted Illinois and EICP reserves—including reserves which were economically mineable or which might have become so in the reasonably near future and further including an estimate as to uncontrolled reserves which might have been acquired by either company in the reasonably near future.

The District Court also found that, as of 1968, the two companies together accounted for 10.9% of the EICP coal production, and that this figure represented more than a 10% decrease from the combined production for 1959. Combined 1959 production by the companies was thus at least 12.1% of the EICP total. If market shares are to be determined by percentage of industry sales, this figure is in excess of percentages found illegal in markets with a trend toward concentration (see, *e. g.*, *United States* v. *Von's Grocery Co.*, 384 U. S. 270

On the basis of a record so devoid of findings based on correct legal standards, the judgment may not be affirmed except on a deep-seated judicial bias against § 7 of the Clayton Act. We should remand the case to the District Court with directions to assess the impact of the Freeman-United Electric combination on the Illinois and EICP sales area coal markets as of 1959.[24] We should direct the court to make findings of respective market shares, and further to evaluate United Electric's viability as an independent producer or as the possible "acquiree" of a company other than General Dynamics as of 1959, in light of the strict standards applicable to the failing-company defense. Since we abdicate our duty for responsible review and accept the mere conclusion that no § 7 violation is established on the basis of a record with none of these necessary findings, I dissent from the affirmance of the District Court's judgment.

(1966) (7.5%), and *United States* v. *Pabst Brewing Co.*, 384 U. S. 546 (1966) (4.49%)), and the court below recognized an increase in concentration in the coal market. It might be argued, however, that, if market share is to be determined by sales, the production figures found by the court below are not the relevant ones for they include production which goes to meet obligations incurred in long-term contracts entered into in prior years. In terms of competition, if sales are the relevant criteria, what is needed is a finding of "new" sales (sales of previously uncommitted coal) as a percentage of total industry new sales in Illinois and the EICP at the time of the acquisition.

[24] Common control of the two companies was achieved in 1959 and the combination was completed in 1967; at oral argument both parties conceded that the merger "took place" in 1959.